MINISTRY OF HEALTH OF THE REPUBLIC OF UZBEKISTAN

BUKHARA STATE MEDICAL INSTITUTE NAMED AFTER ABU ALI IBN SIN

DEPARTMENT OF THERAPEUTIC DENTISTRY

Training and metodology complex

for 3th year students of the Faculty of Dentistry

on subject

CLINICAL ENDODONTICS

Bukhara – 2021

Ministry of Higher and Secondary Special Education
Republic of Uzbekistan
Bukhara Medical Institute named after Abu Ali ibn Sino

Department of Therapeutic Dentistry

«I approve»
Vice Rector for Academic Affairs
Assoc. G.J. Jarilkasinova _____
«____»_____ 2021y

Educational-methodical complex

for 3rd year students

on the subject of Clinical Endodontics

Field of knowledge: 500000– Health and social services

Study area: 510000– Health care.

Directions of study: 5510400– Dentistry.

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Lecture number 1

Topic: Endodontic Instruments...

1.1. Technological models for education

Lesson time 80 min	**Number of students**
Activity type	**Introduce lecture news**
Lecture plan:	***First hour*** 1.Endodontics. Examination and diagnostic methods in endodontics. 2. Radiography in endodontics... ***Second hour.*** 3. Tactics of treating a patient expressing pain 4. Preparing the patient for endodontic treatment.
Objective of the lesson	Inform students, give a complete explanation of Endodontics. Examination and diagnostic methods in endodontics. Urgent situation in endodontics
Teaching methods	Conversation, lecture visuals
Activity type	common-collective
Visual aids on the topic	Study guide, lecture material, projector, computer

The setting for the lesson	Methodical equipped classroom
Monitoring and evaluation criteria	Oral survey

1.2 Technological map of lectures

Stages of work	Teacher	Student
1.Preparation stages (10 minutes)	1.Objective of the lesson 2. Preparation of slides for the lecture material 3.Literature on the topic 1. Borovskiy E.V. "Therapeutic dentistry" M., 2006 2. Borovskiy E.V. va boshqalar "Therapeutic stomatology" .- M., 2004 3.Kamilov Kh.P., Mamedova F.M. "Davolash stomatologydan" recipe reference book. - 1995. 4. Borovskiy E.V., Barisheva Yu.D., Maksimovskiy Yu.M. "Therapeutic stomatology" .- M .: Medicine, 1998.	Listens and records
2.Introduction (15 minutes)	***1. Purpose and objectives of the lecture material:*** **Target:** Highlight an urgent situation in endodontics: diagnosis of odontogenic pain. Highlight the tactics of treating a patient expressing pain **Task:** Inform students, give a complete explanation of Endodontics. Examination and diagnostic methods in endodontics. Urgent situation in endodontics **Questions by topic** 1.Modern endodontics is divided into ... 2. Preventive endodontics 3. Apical opening of the root canal 4. Odontogenic pain	Listen Answers students' questions
3.main stage (45 minutes)	1. Introduction to the topic with slide show	Listen and record

4. Final stage (10 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listens and records

Lecture text

ENDODONTIC INSTRUMENTATION

There are many criteria that allow the classification of tools: their length, flexibility, shape of the working part, method of actuation (manual, machine), etc. However, the main of them should be considered the purpose. On this basis, tools are divided into 5 groups:

1. To expand the mouth of the canals
2. For the passage of the root canal
3. To expand the root canal
4. To determine the size of the channel
5. For filling the root canal

It should be noted that this division is rather arbitrary, since many tools can be used to perform various operations.

STANDARDIZATION OF ENDODONTIC TOOLKIT

The main characteristics of endodontic instruments are defined by standards. Most countries use the international standard ISO 36 30, and national standards such as ADA and DIN are also used. The ISO standard regulates the shape, profile, length, thickness, manufacturing tolerances, minimum mechanical strengths and other characteristics of standard endodontic instruments, color coding for size marking and graphic symbols for various types of instruments.

The main element of an endodontic instrument is a metal rod with a working part. The ISO international standard regulates its parameters. The main characteristics of an endodontic instrument according to the standard are the following parameters:

- the total length of the metal rod can be 21, 25, 28 or 31mm (the most common tools with a rod length of 25mm), the length of the working part is always 16mm;

- the diameter of the tip of the working part of the tool is calculated as the projection of the cone of the working part on the plane passing through the tip of the tool and perpendicular to its median axis.

The diameter of the working part (thickness) is one of the most important characteristics of an endodontic instrument, it is expressed in hundredths of a millimeter and is designated by an ISO number. For example, No. 35 means that the diameter of the tip of the working part of the tool is 0.35mm. In addition, the standard

provides for color coding of this parameter, for example, tool # 35 will have a green handle.

The taper of the working part according to the ISO standard must be constant. It is 0.02mm / mm or 2%. This means that for every millimeter of the length of the working part of the tool, its diameter increases by 0.02 mm. It should be noted that currently there are tools with a taper of 04.06.08.10.12%.

- the standard provides for the graphic designation of types of tools with symbols. It should be borne in mind that the symbols do not correspond to the cross-sectional shape of the working part;

- in recent years, the standards provide for the production of instruments with a non-aggressive tip ("WATT-Nr"). the use of such instruments reduces the risk of rupture or perforation in the canal wall.

MOUNTING TOOLS

ROOT CANAL

Instruments for expanding the root canal orifice Gates Glidden - drill (Fig. 18.) with a narrow drop-shaped working part on a long thin rod. The length of the working part with the rod is 15-19 mm. A series of 6 sizes (1-6) is available with a combination of 050; 070; 090; PO: 130; 150. The size is marked with a ring on the holder (1-6). Designed to work with a contra-angle handpiece at low speeds.

Largo (Peeso-Reamer) - a drill (Fig. 19.) with an elongated working part, which goes into a rigid rod. The length of the working part with the rod is 15-19 mm. A series of 6 sizes is available with a combination of 070; 090; 110; 130; 150; 170.

The elongated working part allows the instrument to be used not only for widening the canal orifice, but also for passing the straight part of the upper third of the canal, palatine canals of upper molars and distal canals of lower molars. "Beutelrock Reamer B2" is an original canal dilator from VDW. Compared to other tools of a similar purpose, its feature is the cylindrical shape of the working part. The tool is made of stainless chrome-plated steel by twisting a flat blade with 2 cutting surfaces.

It is a very sharp and aggressive instrument. It should only be used for the treatment of straight coronal and middle parts of the root canal. Given the very high cutting efficiency of the tool, work with it with great care and only at low speed (450-800 rpm). Do not use the instrument for processing curved canals, as in this case there is an increased risk of wall perforation or fracture of the instrument due to the fact that its end part cannot follow the curvature of the canal. The "BeutelrockDrillreamerBI" from VDW is a root canal expander - unlike other endodontic instruments, it is milled from a single piece like a steel bur. It has a flame-shaped working end with four cutting edges, which tapers towards the tip of the tool. This instrument is also not flexible, therefore it is used only in the straight part of the

canal. The tool is used in a contra-angle handpiece with a low rotation speed - from 800 to 1200 rpm. Compared to a duct expander

Beutelrock Reamer B2 is less aggressive. It is designed to create and expand root canal access. The Orifice Opener has a four-sided working part tapering to the apex and is available in three sizes. The manufacturer is Maillefer. This handheld tool for wellhead expansion

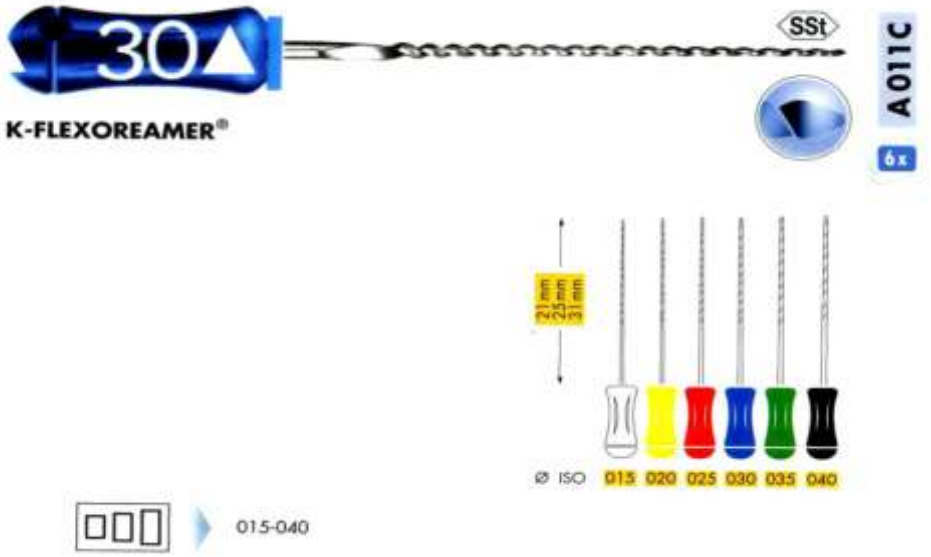
third of the root canal Orifice Opener MB - similar to the previous instrument, but with a bullet-shaped working part covered with diamond powder. It is also a hand tool. Manufacturer-firm "Maillefer".

INSTRUMENTS FOR ROOT CANAL PASSAGE

Reamer drills are used to pass the root canal. They are characterized by the flexibility and high cutting ability of the tool edges. This is largely due to the elongated pitch of the cutting edges. K - Reamer drill (Kerra drill) - available in twenty sizes: 0.08, 0.010, 015,

020, 025, 030, 035, 040, 045, 0.50, up to 0.90, in accordance with ISO standards.

K-FlexoReamer - has great flexibility, which is associated with a change in the pitch of the spiral. Flexible drills are available in a series of 6 standard lengths. Their use is shown for curved canals.



K- FlexoReamer Golden Medium - intermediate dimensions tool. Designed for a smoother transition to the next size. The tool is produced in a set with a diameter of 0.12, 0.17, 0.22, 0.27, 0.32, 0.37. Their use almost completely eliminates jamming of the tool and the formation of ledges in the channel.

K- FlexoReamer Golden Medium - intermediate dimensions tool. Designed for a smoother transition to the next size. The tool is produced in a set with a diameter of 0.12, 0.17, 0.22, 0.27, 0.32, 0.37. Their use almost completely eliminates jamming of the tool and the formation of ledges in the channel.

Reamer for-side - it is used for the passage of very thin canals, especially molars, with difficulty opening the mouth. The set includes 18 tools with a diameter of 0.066, 0.08, 010.015 and a length of the working part of 15-18 mm.

"K-Reamer Deepstar" is a set of instruments designed for filling root canals. It includes a set of short K-reamers (15 and 18mm) with a sharp, aggressive tip. The set includes 18 tools: K-reamers in sizes from 20 to 60 and two “Orifice” tools. "Pathfinder" (pathfinder) is the original development of the company "Kegg". The tool has a molded tip, minimal taper, sharpened cutting edges and high flexibility. It is made of high quality stainless steel. "Pathfinder" is designed to pass narrowed root canals. It is indicated by the “P” symbol on the handle. Its thickness corresponds to ISO number 09.

A C + file manufactured by Maillifer / Denteply has a similar design and purpose. It is a tool with a profiled pyramidal tip, a polished surface and increased bending strength. "C + file" is produced in three sizes (No. 08, 10, 15) and three options for the length of the working part (18, 21, 25mm). Pathfinder CS was developed by Kegg. It is made of carbon steel, which gives it high strength and increased cutting ability. Due to the properties of steel and the reduction in the length of the working part, the risk of kinking and fracture of the tool is reduced. The minimum taper ensures maximum pressure transfer along the axis of the working tip

to the pointed aggressive tip of the instrument, so the Pathfinder CS is especially effective in narrow, curved and highly calcified root canals.

The extended handle provides tactile control when working in the root canal. Pathfinder CS is available in two sizes: K1 corresponds to number 07; K2 - number 09 according to ISO.

ROOT CANAL EXPANSION TOOLS

K-Fi1e (Kerr drill) - (Fig. 23) is characterized by a small step of cutting edges, which distinguishes it from K-Reamer. In accordance with the accepted standard, a series of 21 sizes is produced, with a length of the working part of 21, 25, 28, 31 mm. K-FlexoFi1e GoldenMedium - (Fig. 25) a flexible channel-expander of an intermediate size. The tool is used to smoothly transition from one tool size to the next. Available in 6 sizes: 0.12, 0.17, 0.22, 0.27, 0.32, 0.37 with the length of the working part 21, 25, 31 mm. Hedstroem file - Hedstrom's drill (Fig. 27.) is designed to align the walls of the root canal. Produced in accordance with ISO standard 20 sizes from 08 to 0140, lengths 21, 25, 28, 31 mm. Rotational movements cannot be done with the tool, only reciprocating movements are carried out.

Profile 04 Taper Series 29 Rotazy Instruments - (Fig. 28.) A type of rotary endodontic instrument developed by Tusla Dental Product, part of Dentsplay. According to the existing standard, which differs from the ISO standard, 13 sizes are produced (the JSO equivalent is given in brackets): 00 (060), 0 (077), 1 (100), 2 (129), 3 (167), 4 (216) , 5 (279), 6 (360), 7 (465), 8 (611), (775), 10 (1000), 11 (1293).

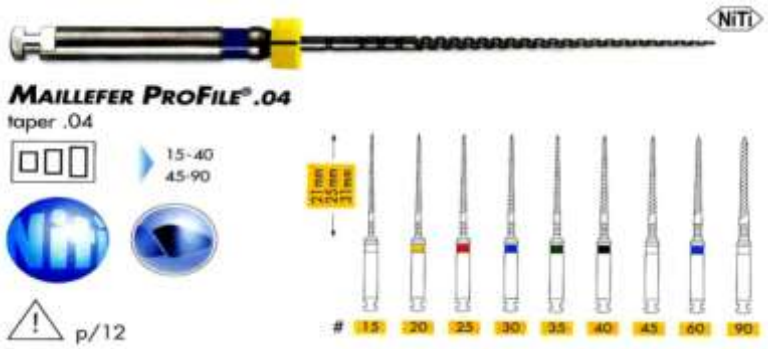


Figure 28

K-File nitifeex - (Fig. 26.) is used for the passage of very curved (up to 90º) and thin canals. This tool has a non-corrosive (blunt) tip and increased flexibility as it is made of a nickel-titanium alloy. In accordance with the standard, 10 sizes are produced: 015, 020, 025.030, 035, 040, 045, 050, 055, 060, the length of the working part is 21, 25, 31 m the previous one by 29%. This makes the effect of an even increase in the diameter of the root canal. The tools are made of nickel-titanium alloy, which gives super flexibility and strength. The passive (blunt) shape of the tip of the tool keeps it in the direction of the channel even in places of greatest bend, which

significantly reduces the likelihood of perforation and shoulder creation. The profiles are adapted to work with an endodontic handpiece. "S-File" (S - file, unifile, SET-H-File) - is made from a conical blank by milling and differs from the usual Headstrom file in that it has a double helical cutting edge and resembles the letter "S" on the cut. In addition, the spiral grooves on the tip of this tool are not so deep, so it is much stronger and more symmetrical. The cutting efficiency of this tool is higher than that of the H-file. The design of the S-file allows them to perform not only sawing, but also rotational movements in the canal, although, according to A.I. Nikolaev and L.M. Tsepov (2004), rotate it in the canal, like any other tool made by the method milling, should be extremely careful. Machine-made nickel-titanium analogs of S-files are also being produced, for example,

"Endosonore file" - a tool for ultrasonic expansion of the canal using special preparations. Endomatic file - files for endodontic handpieces. "GT Files" (files with maximum taper) is a development of Tulsa Dental Products (USA). They are made of nickel-titanium alloy, have a specially designed ergonomic handle and a very large taper - 3-6 times more than standard endodontic instruments. The travel of the spiral screws on the working part is the opposite, therefore, when rotating in the channel, the probability of jamming and breaking off of the tool is practically excluded. During operation, the "GT-file" moves into the canal without rotation until it stops, screwed into the canal by 0.5-5 turns counterclockwise until it gets jammed in the dentin. The file is then rotated with firm apical pressure clockwise 90 ° -180 °, a click is heard, indicating that the dentine has been cut. Then, the file is screwed back into the dentin and rotated clockwise again. Thus, the canal is processed along the entire length. The described channel processing method is called the “balanced force principle”. Another way to use "GT files" is as follows. The file is forcibly twisted into the canal clockwise. Periodically it is taken out to clean it of dentin sawdust. This channel processing method is implemented in the "GT Ro-tary Files" system. "GT files" allow complete machining of the canal with only one tool (usually 10-14 "standard" tools are required). A total of four manual "GT-files" with taper 06, 08, 10 and 12 are produced. The choice of instrument is made depending on the anatomical structure of the root and canals of the tooth.

Orifice Shapers are tools with a large taper from 5 ° to 8 ° and a short working length (19mm). Designed for safe preparation of a straight and slightly curved part of the canal, and the presence in the range of six instruments P 6,5,4,3,2,1 with apex diameter 0.80; 0.60; 0.50;

0.40; 0.30; 0.20mm accordingly will allow us to sequentially widen the canals from the orifice to the apical foramen using the Crow Down technique. The continuous improvement of endodontic instruments, taking place in recent years, is aimed at realizing the long-standing dream of endodontists around the world to create

universal and ideal files for preparation with a minimum number of their varieties. The emergence and further evolution of nickel-titanium rotating files led to the creation of conceptually new Pro Tarer instruments.

These tools do not conflict with the concept of profiles 04, 06 JIT and others. They perfectly complement the previous assortment, having a special purpose - especially difficult for preparation with traditional instruments, highly calcified, curved and "S-shaped" canals (VB Johnson 2001).

Benefits of the ProTapers: o Patented progressive tapered file shape for improved flexibility and exceptional cutting efficiency, especially important when working in narrow or highly curved canals. o Only a few instruments are required to obtain a tapered preparation along the entire length of the canal. During operation, the ProTapers capture a small portion of the dentin from the root canal walls, reducing torsional stress and file fatigue, thereby preventing the possibility of file breakage. o Triangular, convex cross-section of the instruments reduces contact between the file and the dentin of the root canal. Specially designed guide tip.

Lecture number 2

Topic: Tooth morphology, access to the cavity and root canals of the tooth. Endodontic instruments

2.1. Technological models for education

Lesson time 80 min	**Number of students**
Activity type	**Introduce lecture news**
Lecture plan:	***First hour.*** 1. Tooth morphology 2.Access to the tooth cavity ***Second hour.*** 3. Access to the root canals of the tooth 4.Endodontic instruments
Objective of the lesson	Inform students, give a full explanation of the morphology of the tooth, access to the cavity and root canals of the tooth. Endodontic instruments
Teaching methods	Conversation, lecture visuals
Activity type	common-collective
Visual aids on the	Study guide, lecture material, projector, computer

topic	
The setting for the lesson	Methodical equipped classroom
Monitoring and evaluation criteria	Oral survey

2.2 Technological map of lectures

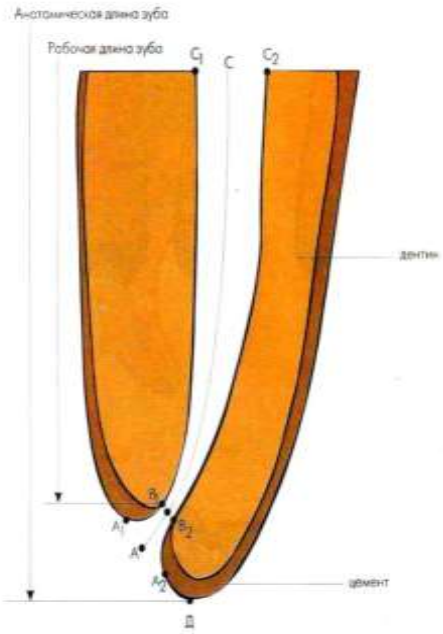
Stages of work	Teacher	Student
1.Preparation stages (10 minutes)	1.Objective of the lesson 2. Preparation of slides for the lecture material 3.Literature on the topic 1. Borovskiy E.V. "Therapeutic dentistry" M., 2006 2. Borovskiy E.V. va boshqalar "Therapeutic stomatology" .- M., 2004 3.Kamilov Kh.P., Mamedova F.M. "Davolash stomatologydan" recipe reference book. - 1995. 4. Borovskiy E.V., Barisheva Yu.D., Maksimovskiy Yu.M. "Therapeutic stomatology" .- M .: Medicine, 1998.	Listens and records
2.Introduction (15 minutes)	***1. Purpose and objectives of the lecture material:*** **Target:** To highlight the morphology of the tooth, access to the cavity and root canals of the tooth. Endodontic instruments **Task:** Inform students, give a full explanation of the morphology of the tooth, access to the cavity and root canals of the tooth. Endodontic instruments **Questions by topic** 1.Physiological apical foramen... 2.X-ray apex 3.Access to the cavity and root canals of the tooth. 4.Endodontic instruments	Listen Answers students' questions
3.main stage (45 minutes)	1. Introduction to the topic with slide show	Listen and record

4. Final stage (10 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listens and records

Lecture text

Knowledge of the topography of the tooth cavity, the principles of preparation of the tooth cavity and root canals using modern tools and techniques, materials for filling root canals is the key to successful endodontic treatment and expands the possibilities for preserving teeth. Tooth cavity (cavum dentis). Its crown part (cavum coronale) in its structure repeats the anatomical shape of the crown of the tooth, and the shape of the root canals - the shape of the roots of the teeth. The tooth cavity communicates with the periodontium through the main root canal and additional root canals. Additional canals are opened mainly in the area of the root apex or in the middle third of the root, as well as in the area of bifurcation (in molars). In addition to knowledge of the anatomy of various groups of teeth, it is necessary to take into account age-related changes in the structure of the tooth cavity, as well as the influence of pathological processes on her condition. The cavity of the tooth in the temporary teeth of children is distinguished by its large size, wide canals and apical foramina. During a person's life, the shape and size of the cavity change due to the plastic activity of odontoblasts - dentin builders. Often, in older people, the coronal part of the tooth cavity decreases in size, and sometimes completely disappears. The mouths of the canals and the canals themselves become narrowed. The root canal is divided into equine, middle and apical (apical) parts. The root part, usually the widest, is adjacent to the canal mouths. In the apical part, various variants of the canal structure are observed: its narrowing, apical bend, branching (ramification), lateral positions of the apical foramen, fusion of several canals, unclosed apical foramina, physiological or pathological root resorption. In the apical part, at the dentin-cement border, the canal ends with a narrowing (Fig. 1) (physiological apical foramen), usually located at a distance of 0.5-1.0 mm from the X-ray apex. The extreme point of endodontic intervention should be precisely this physiological narrowing, since here the pulp tissue passes into the periodontal tissue. With age, it moves further from the radiographic apex due to the deposition of secondary cement. Some authors distinguish separately the anatomical apical foramen - foramen apicale - the place of transition of dentin to cement. Sometimes the apical foramen is located laterally, vestibular or lingually - on the root wall, and not at its apex. In this case, the physiological apical foramen can be located much further from the radiographic apex (up to 5 mm), which is not recorded on a conventional radiograph. This location of the apical foramen can be determined using X-ray examination either in different

projections, or after the introduction of a pre-curved endodontic instrument into the canal. Variants of the ratio of the radiological and working length of the teeth are shown in Fig. 1.



Picture 1

In fig. 2 shows the most common classification of canals in the root of the tooth (Weine, 1976).

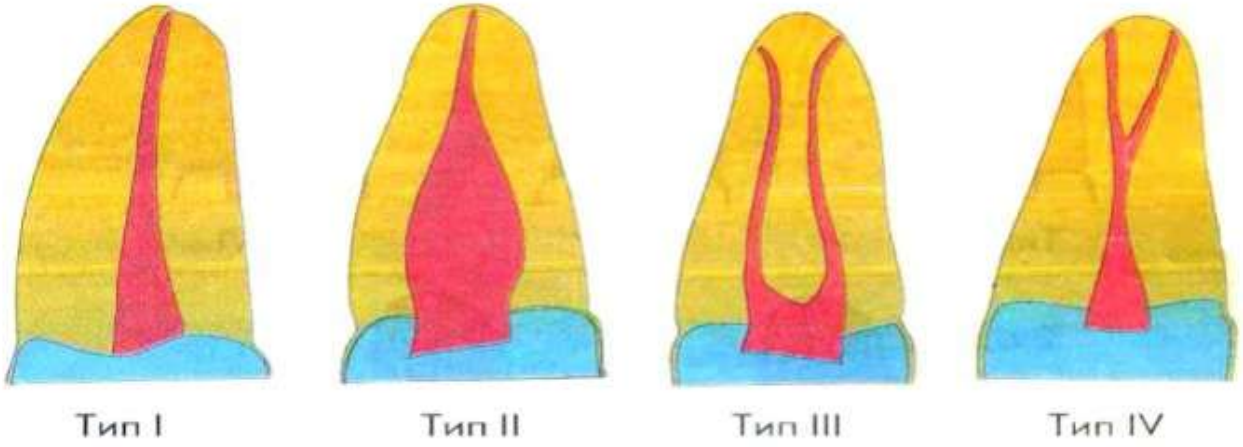


Figure 2.

Each of the proposed varieties assumes certain features of endodontic treatment. The easiest way to work with type I channels. Type II canals require special attention during obturation: one canal is obturated to the apex, the second to the confluence with the first. Type III channels are often narrower and less accessible. When instrumental processing of type IV canals, it is usually necessary to work separately in each canal with curved instruments, positioning them in accordance with the bend

of the canal. During obturation, first one canal is filled, then the obturating material is removed to the site of the bifurcation of the canal, after which the remaining canal is obturated.

ANATOMY AND TOPOGRAPHY OF THE TEETH

Doctors performing manipulations in the root canals, even before starting treatment, should be aware of the possible options for their number, shape and length. Regrettably, it should be noted that insufficient attention is paid to the anatomy of the teeth, including the practically important section, the topography of the tooth cavity and the number of root canals. As a result of the prevailing stereotype, it is believed that incisors, canines and premolars, with the exception of the first premolar of the upper jaw, have one root canal, the first premolar has two, and molars have three root canals. In practical dentistry, the possibility of the existence of additional channels is almost completely ignored. The search for additional root canals is also not paid attention to because the root canals in molars, the existence of which is beyond doubt, in a significant percentage of cases, they are not sealed. We provide a table of data from mqJ, Bekland (1994) on the frequency of occurrence of additional canals, depending on the group of the tooth.

Table 1

The frequency of occurrence of additional canals, depending on the group of the tooth

4 channels	3c hannels	2c hannels	1c hannels	Tooth formula	4 channels	3 channels	2c hannels	1 channel
Lower jaw					**Upper jaw**			
-	**-**	**thirty**	**70**	**1**	**100**	**-**	**-**	**-**
-	**-**	**44**	**56**	**2**	**100**	**-**	**-**	**-**
-	**-**	**6**	**94**	**3**	**100**	**-**	**-**	**-**
-	**-**	**26.5**	**73.5**	**4**	**nine**	**85**	**6**	**-**
-	**-**	**13.5**	**85.5**	**5**	**75**	**24**	**1**	**-**
28.9	**64.4**	**6,7**	**-**	**6**	**-**	**-**	**56.5**	**43.5**
7	**77**	**13**	**3**	**7**	**1**	**2**	**57**	**40**

As follows from the presented data in the table, only the incisors of the upper jaw and the canine always have one canal. All other teeth have different variations in their number. You should always remember this and be prepared for emergency situations during endodontic treatment. These indicators indicate the need for an

extremely careful search for root canals, taking into account the maximum possible number of them and all options for location. This applies primarily to the first upper painters, in most cases with bifurcations of the mesio-buccal canal, lower incisors, quite often two-channel, lower first molars, often having more than three canals. But, as can be seen from the table, deviations from the clinical topographic anatomy of the pulp cavities are found in most teeth. Quite often, such deviations cannot be detected with a conventional X-ray examination in one projection. It should be noted that the cross-section of the root canal almost never has a regular round shape. Only with age, due to the deposition of replacement dentin, the cross-section of the canal decreases in diameter and becomes more round.

ANATOMO-TOPOGRAPHIC STRUCTURE OF TEETH CAVITIES

Insufficiently clear orientation in the topography of the tooth cavity is a common cause of poor-quality treatment.

The anatomical formula of the tooth cavity of the 1st and 2nd lower molars has a significant size and a rounded quadrangular shape, and the mouths of the canals are located so that when they join, an equilateral triangle is formed, and the fourth canal (if any) is located in the posterior (distal) root ... The cavity of the tooth of the molars of the upper jaw has a slit-like shape, squeezed in the anteroposterior direction, and the mouths of the canals are located, as it were, at the apex of an obtuse triangle. Moreover, the mouths of the anterior and posterior cervical canals are located side by side, the additional canal is usually located in the antero-cheek root. The mouths of the canals in the molars of the upper jaw form an obtuse triangle. Opening (trepanning) of the tooth cavity of the incisors and canines

produced from the lingual surface, closer to the cutting edge. The direction of the bur should correspond to the axis of the tooth and, as it were, intersect the cavity of the tooth in its center. Otherwise, the crown may be perforated. After trepanation of the tooth cavity, the hole is widened with a spherical or fissure bur, creating good access to the canal. In this case, the trepanation hole should not violate the integrity of the incisal edge. When preparing premolars, the opening of the tooth cavity should be made from the occlusal surface, parallel to the axis of the tooth. It should be remembered that in premolars of the upper jaw, the crown at the neck of the tooth is compressed in the anteroposterior direction, and the cavity of the tooth is located in the direction (from tubercle to tubercle).

For clarity, we present pictures of each group of teeth.

LETTER DESIGNATIONS:

B - vestibular.

D - distal,

M - mesial,

I-lingual surface.

The drawing of each tooth of the left half of the lower jaw is presented by the most common variant in 5 projections. In Fig. 3, these projections are numbered.

1. Longitudinal section of the tooth in the mesiodistal direction, view of the tooth from the lingual side; This projection shows the natural inclination of the tooth in relation to the vertical (horizontal) plane.

2. Longitudinal section of the tooth in the vestibulo-lingual

direction, view of the tooth from the mesial side; this projection represents the natural inclination of the tooth in relation to the vertical (horizontal) plane.

3. Top view of the tooth (crown).

4. Horizontal cut of the tooth at the level of its neck: the shape of the pulp chamber and the mouth of the root canals.

5. Horizontal section of the root (s) at a level of 3 mm from the apex.

6. Sometimes any one projection of another variant of the structure of a given tooth in endodontic aspect is presented.

The central incisor of the upper jaw.(Fig. 3). The coronal part of the tooth cavity is formed by the labial, palatal and two lateral walls. It looks like a triangular slit compressed in the vestibular-palatal direction. The arch of the cavity is defined at the level of the middle third of the crown of the tooth with three indentations directed towards the incisal edge. Towards the root, the coronal cavity narrows and becomes a single root canal. The canal of the central incisor of the upper jaw is wide, rounded in cross section. Average tooth length 25mm (23.5-25.5mm).

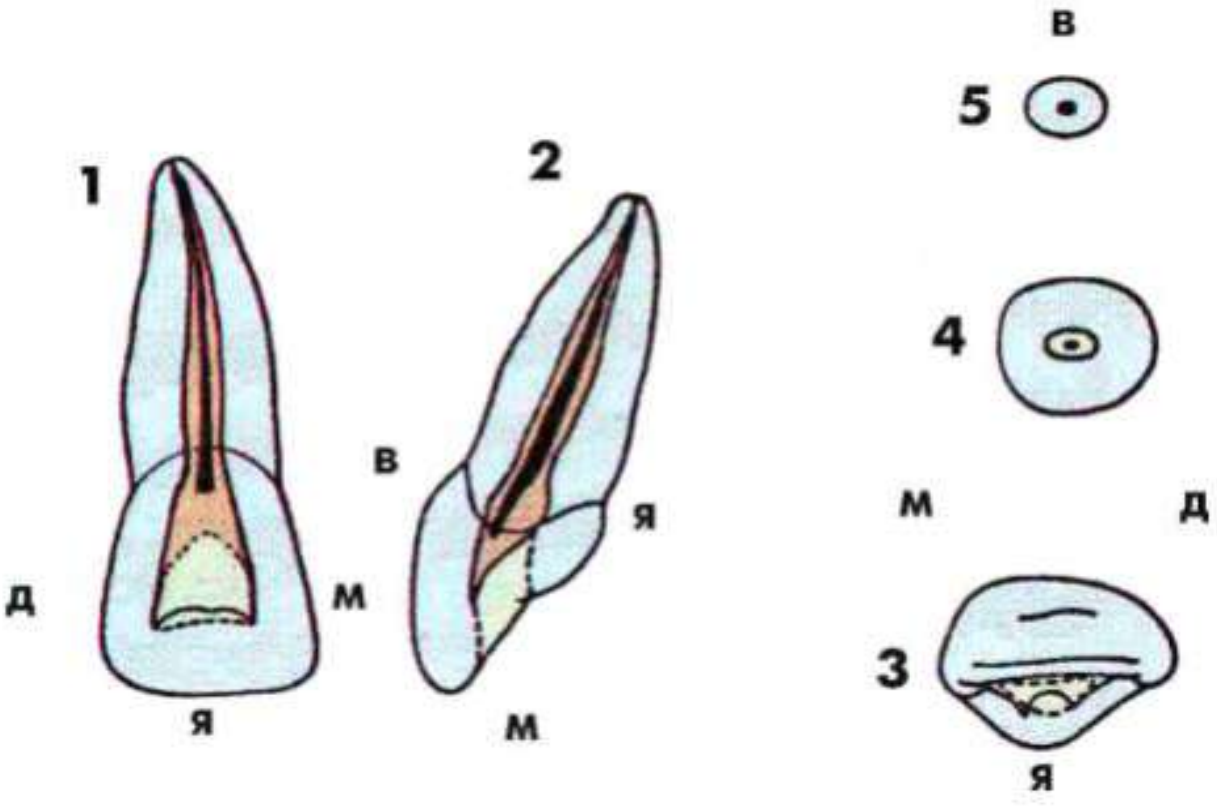


Figure 3 UPPER CENTER CUTTER (left) - VL1

Tooth length, - average - 24 mm, span 18-29 mm Number of canals 1 - 100% Lateral canals 24%

Apical deltoid ramifications 1% Apical foramen 0-1 mm from the apex 80% 1-2 mm from the apex 20%

It has 1 root and 1 canal in 100% of cases. Note: The channel is 75% straight. If it deviates, then more often in the vestibular or distal direction. There is orifice constriction that is often difficult

find. Lateral incisor of the upper jaw. (Fig. 4). The coronal part of the tooth cavity has the form of a triangle, its widest part is in the area of the tooth neck. The arch of the tooth cavity is determined along the line of the middle third of the crown, has three recesses directed to the cutting edge, respectively, its tubercles. The canal is compressed from the sides, somewhat narrower than in the central

incisors. On the transverse section, the canal is elongated in the vestibular-palatal direction and has an oval shape. Often the apex of the root and root canal is slightly curved in the palatal direction. An additional channel occurs in 1% of cases. Average tooth length 23mm (21-25mm), 1 root, mainly 1 canal in 99% of cases. Note: the channel is only 30% straight. At 50%, the canal deviates distally. There is a pronounced mouth narrowing.

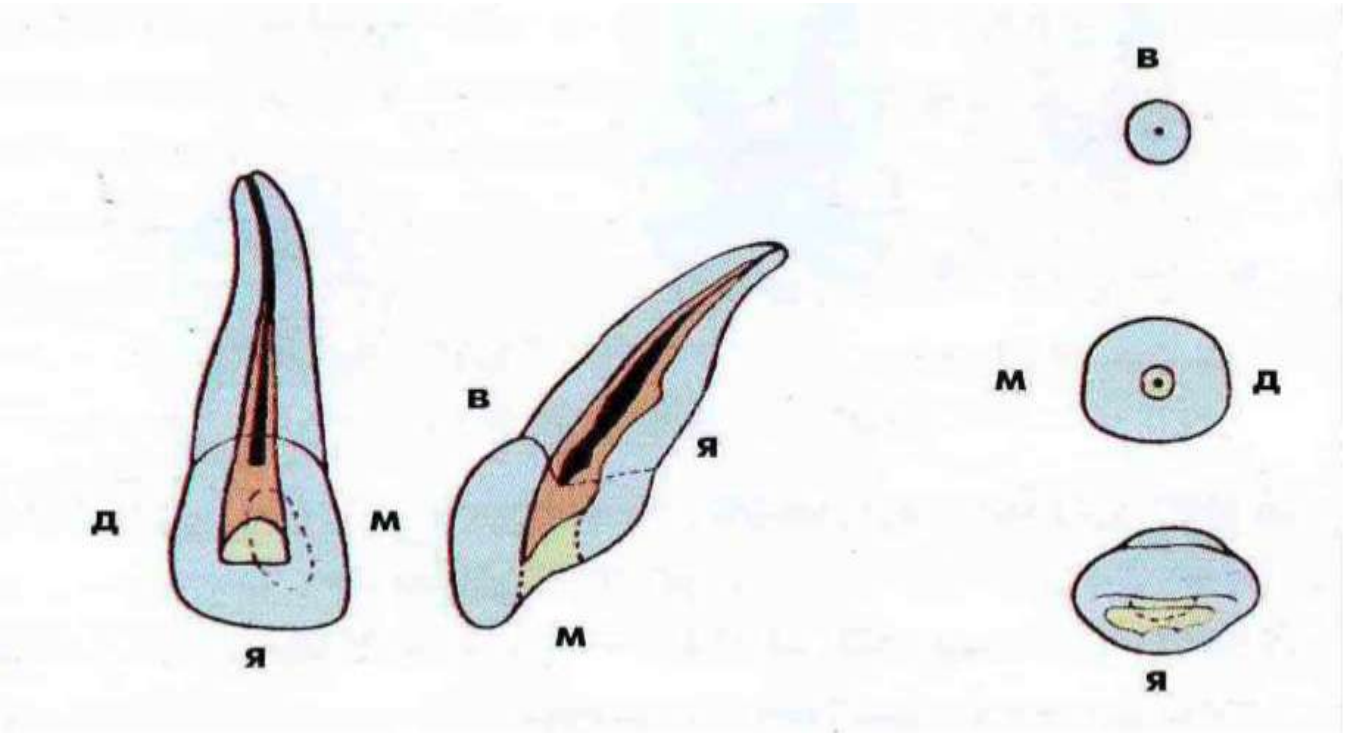


Figure 4. Tooth length: average 23 mm, span 17-29 mm Number of canals 1-100% Lateral canals 26% Apical deltoid ramifications 3% Apical foramen 0-1 mm from the apex 90%

1-2 mm from the apex 10%

Canine of the upper jaw. Rice. 5. The cavity of the tooth has a retented shape. At the level of the middle of the crown, the cavity expands, and at the level of the neck it is small. Then the cavity of the tooth, without visible boundaries, passes into a wide root canal. On a cross section, it looks like an oval, extended in the buccal-palatal direction. Often, the root and root canal in the apex area is curved in the lateral or palatal direction. The longest teeth are on average 27mm (24-29.7mm), always 1 root and 1 canal. Note: a straight root canal occurs in 40% of cases, its distal deviation - in 32% and vestibular - in 13%.

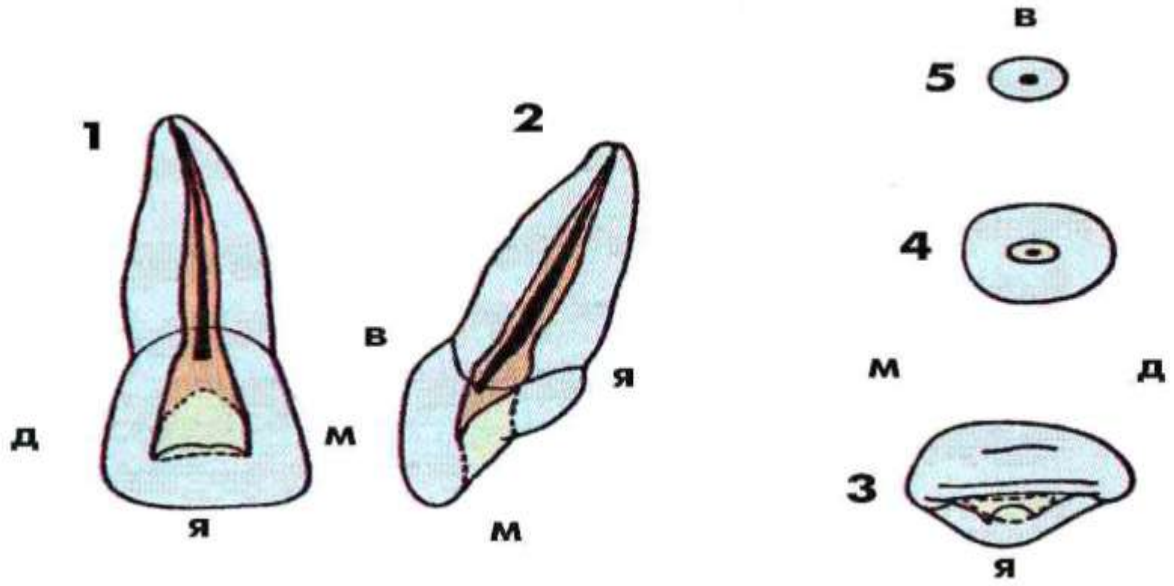


Figure 5 Tooth length: average - 27 mm, span 20-38 mm Number of canals 1-100% Lateral canals 30%

Apical deltoid ramifications - 3% Apical foramen 0-1 mm from the apex 70% 1-2 mm from the apex 30%

The central incisor of the lower jaw. Rice. 6. The cavity of the tooth resembles a triangle. The arch of the tooth cavity is located close to the incisal edge. The coronal part of the cavity smoothly passes into the root canal. Since the root of the tooth is compressed in the medio-lateral direction, the cavity of the tooth on the cross-cut has an oval or slit-like shape. The channel is narrow, often poorly passable. Average length 21mm (19-23mm), 1 root and 1 canal in 70% of cases, 1 root and 2 canals in 30% of cases.

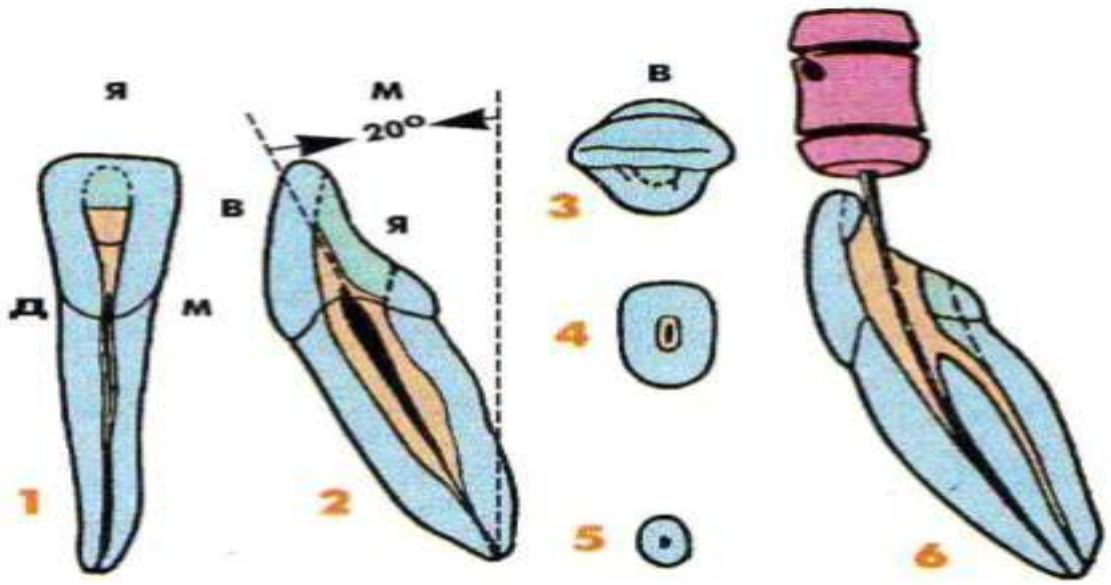


Figure 6 BOTTOM CENTER CUTTER (LEFT)

Tooth length in mm: average - 21, span - 17-25 Number and names of channels 1 channel - 65%

Lateral canals - 20% Apical deltoid I ramifications - 5% Apical foramen 0-1 mm from the apex - 90% 1-2 mm from the apex -10% 2 canals - 35%, labial, lingual 2 canals 1 hole - 27% 2 canals 2 holes - 8%

Notes: two canals located in the vesetibulo-oral direction are not uncommon in the lower incisors. A well-sealed one canal on the roentgenogram masks the one that was not found with a clear progression of periapical pathology. It should be borne in mind that the lingual canal is located quite close to the lingual surface. Therefore, the access cavity, in order to capture the lingual canal, must descend to the neck of the tooth. If there is one canal, its shape in the apical third is slit-like; if there are two, it is rounded.

Lateral incisor of the lower jaw. (Fig. 7.) The tooth cavity is slightly larger than the tooth cavity of the central incisor. The canal is oval, extended in the vestibular-lingual direction. The main difference from the central incisor is that the lateral incisor has a wider canal, often two canals are found - the vestibular and the lingual.

The average size is 22mm (20-24mm), in 67% of cases 1 root and 1 canal, in 20% - 2 roots and 2 canals, in 13% - 2 roots converging at the apex.

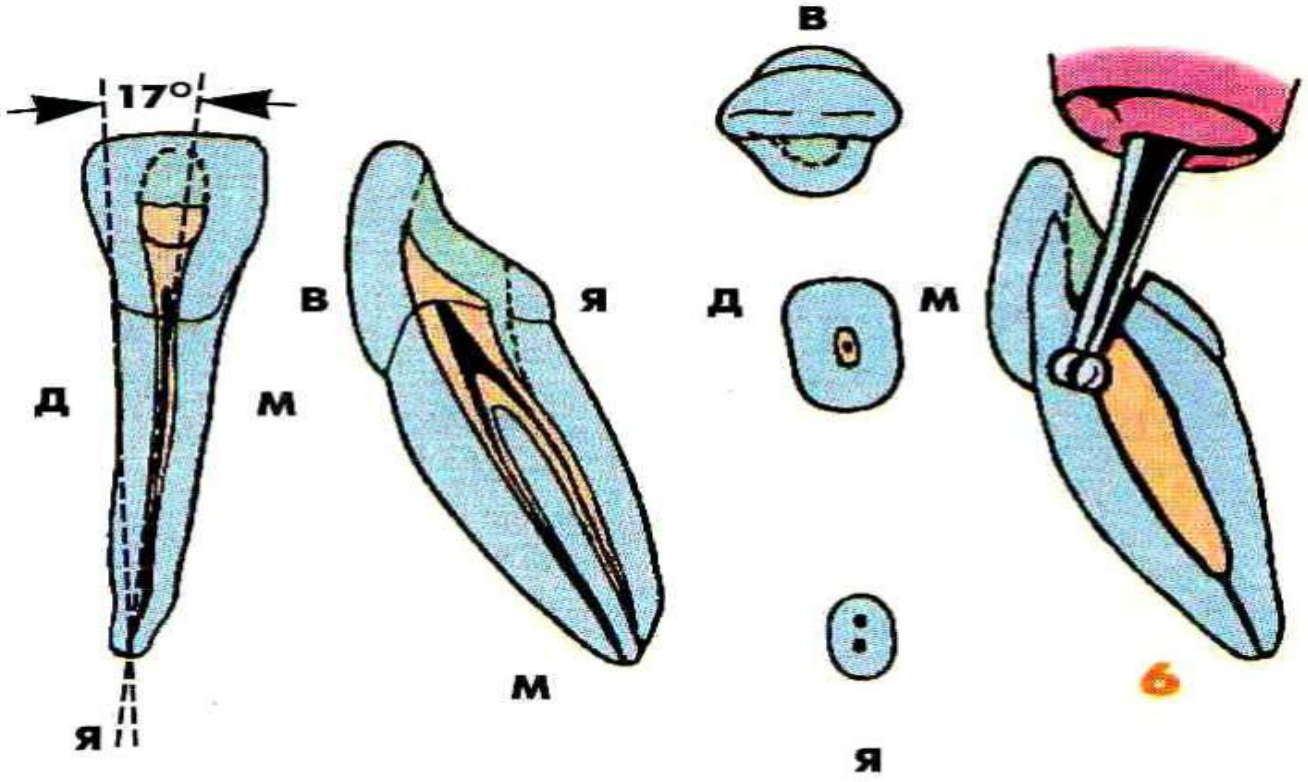


Figure 7 LOWER SECOND CUTTOR (LEFT)

Tooth length in mm average -22, span -17-27 Number and names of canals 1 canal - 57% Lateral canals - 18% Apical deltoid ramifications - 6% Apical foramen 0-1 mm from the apex - 90% 1-2 mm from the apex - 10% 2 canals -43%, labial, lingual 2 rope 1 hole - 14% 2 canals 2 holes - 29%

Notes: when developing the access cavity, it is necessary to take into account the vestibular-axial tilt of the first, second, third and mesio-axial tilt of the second and third lower teeth. Vestibulo-axial tilt and pronounced curvature of the vestibular surface can lead to the inclusion of the incisal edge of the lower anterior teeth in the access cavity.

Canine of the lower jaw. (Fig. 8.) The cavity of the tooth, like the tooth itself, has a fusiform shape. The vault has a depression corresponding to the cutting tubercle. At the level of the middle of the crown, the cavity expands. It reaches its largest size in the area of the neck of the tooth, smoothly passing into the root canal. On the cross section, the canal has an oval shape and is compressed in the mediolateral direction. Often there are two canals - buccal and lingual. Average length 26mm (23.3-28.5mm), 1 root and 1 canal in 94% of cases and 1 root and 2 canals in 6%.

Notes: the root canal is straight and may bend in the apical part laterally by 20% and / or labially by 7%. The canal in the mouth and middle third is oval and

compressed in the mesiodistal direction. The canal axis, like that of the lower incisors, passes through the incisal edge, especially in the elderly, which may require its inclusion in the access cavity. The outlines of the access cavity are elongated in the gingival-incisor direction.

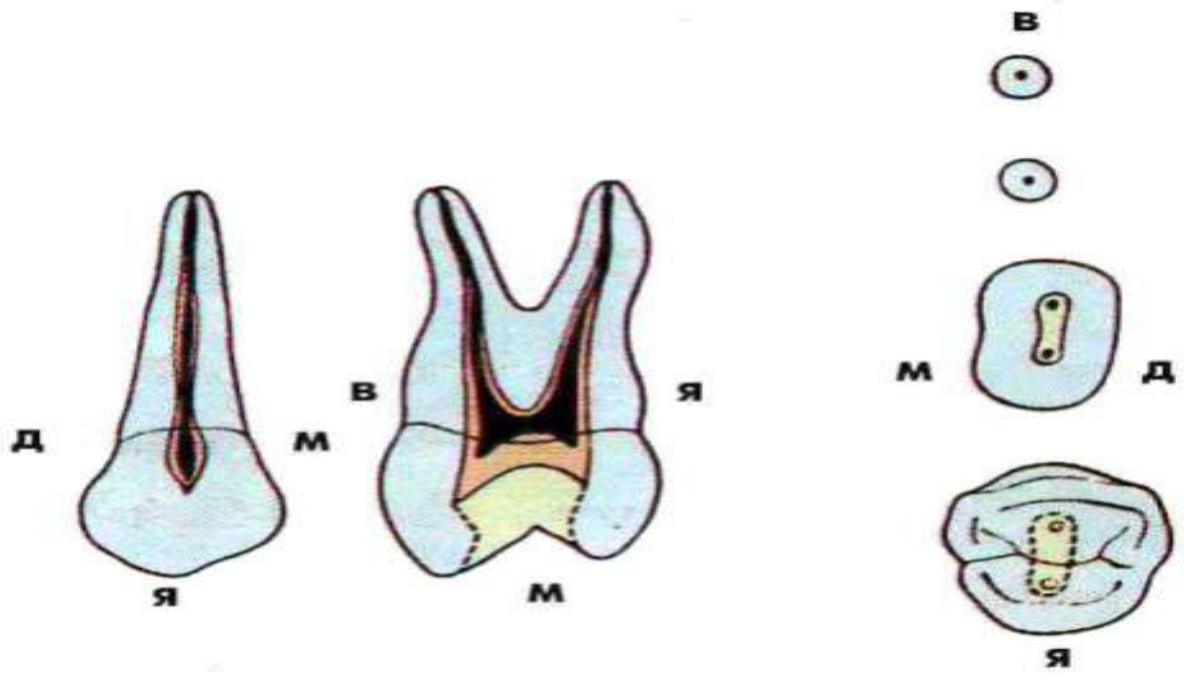
Maxillary first premolar... (Fig. 9.) The coronal cavity of the tooth is compressed in the anteroposterior direction, has the shape of a slit, elongated in the buccal-palatal direction. It distinguishes a vault

tooth cavities, bottom and four walls. The arch of the cavity is located at the level of the neck of the tooth, has two protrusions, respectively, the buccal and palatine tubercles. The cheek protrusion is more pronounced. The bottom of the tooth cavity has a saddle shape and is located much higher than the neck of the tooth, under the gum. Along the edges of the bottom of the tooth cavity, the mouths of the buccal and palatal canals are funnel-shaped. The canals are difficult to pass, but the palatine canal is wider, straight, and the buccal canal is narrower and curved.

In 2-6% of cases, there are three channels: two buccal (anterior and posterior) and

one palatine. The average length is 21mm (19-23mm), has 2 roots and 2 canals in 79% of cases, 1 root and canals in 18%, 3 roots and 3 canals in 3%.

Note: the most common variant of the tooth occurs with two divergent roots up to 60%. A single-root version with one or two canals ending in one apical foramen occurs in 18%. The bottom of the tooth cavity is often significantly lower than the neck. This position does not change with age due to the deposition of secondary dentin.



UPPER FIRST PREMOLAR (left) - VL4

Tooth length: average - 21 mm span 17-26 mm Number of canals 1 -12%, 2-86%, 3-2% Lateral canals 49% Apical deltoid ramifications 3% Apical foramen 0-1 mm from the apex 95% 1-2 mm from apex 55%

The second premolar of the upper jaw. (Fig. 10.) The coronal cavity of this tooth resembles the cavity of the first premolar, is compressed in the anteroposterior direction, has the shape of a slit, elongated in the bucopalatine direction. The arch of the cavity is located at the level of the neck of the tooth. The coronal cavity without a sharp border turns into a straight, well-passable root canal, the mouth of which is located in the center of the cavity. In 24% of cases, the second maxillary premolar often has two canals (buccal and palatal), which can be connected and opened by one or two apical foramina. Average length 22mm in 56% has 1 canal and 1 root, 42% has 2 roots and 2 canals, 2% has 3 roots and 3 canals.

Note: in all manuals, the basic version L5 is presented as a single-rooted and single-canal tooth. However, channel 2 is observed in almost half of the cases. This fact is underestimated and is the cause of serious complications that do not fit into the X-ray picture. According to Ingle et al. (1985) one or two canals terminating in one apical foramen occur in 75% of cases. in other cases, there are separate canals in the tooth. The canal curvature according to the bayonet type is observed in 21%, the distal deviation of the corpus - in 27%, as well as in B4 - a low position.

sensation of the bottom of the pulp chamber.

The first premolar of the lower jaw.(Fig. 11). The coronal cavity of the tooth is oval, narrowed in the anteroposterior direction. There are two depressions in the fornix of the cavity, the larger one corresponds to the larger buccal tubercle, the smaller the lingual one. The largest cavity size is observed below the tooth neck. Gradually narrowing, the tooth cavity turns into one passable canal. There may be two canals (buccal and lingual), which can connect and open with one or two apical foramina. The average length is 22mm (20-24mm), has 1 root and 1 canal in 74% of cases, or 1 root and 2 canals converging at the apex in 26% of cases.

Note: the occlusal surface is sharply inclined lingually due to the weakly expressed lingual tubercle. which can lead to perforation of the buccal surface of the root with a difficult search for the pulp chamber. The buccal horn is well defined. The pulp chamber and the oval canal are compressed in the mesio-distal direction. Curvature of the apical part is most often distal (57%). It should be borne in mind that channels of the IV class according to Weine are quite common. According to Valued (1978), this occurs in 24% of cases. The second premolar of the lower jaw. (Fig. 12.) The coronal cavity of the tooth is rounded. In the vault of the cavity, there are two uniform depressions, respectively, the buccal and lingual tubercles. Gradually narrowing, the cavity of the tooth crown passes into one well-passable canal.

The average length is 22mm (20-24mm), in 97% of cases it has 1 root and 1 canal, in 3% - 1 root and 2 canals.

Note: the pulp chamber and oval root canal are compressed in the mesio-distal direction. The canal is straight, cannot have a 40% bend in the apical third, and / or 10% vestibularly. Apical foramen incl. may be 3 mm from the apex. Given the slight distal inclination of the tooth and the frequent distal curvature of the root, it is necessary to form access cavities with mesial displacement. And in the cavity of the tooth, mouth narrowing is expressed.

Maxillary first molar... (Fig. 13). In the coronal part of the tooth cavity, which repeats the shape of the crown, the arch, the bottom of the cavity and four walls (buccal, palatal, anterior and posterior) are distinguished. On a cross-section, the tooth cavity has the shape of a rhombus. The vault of the cavity is located on the border of the upper and middle third of the crown of the tooth, has depressions corresponding to the masticatory tubercles. The larger depression corresponds to the larger anterior buccal cusp. The bottom of the tooth cavity is slightly convex and is located at the level of the tooth neck or slightly above it, under the gum. At the bottom of the tooth cavity there are three mouths of the root canals of the anterior buccal, posterior buccal and palatal, which, when connected, form a triangle. The base of the latter is formed by a line connecting the mouths of the buccal canals, and the apex is formed by the palatine. The longest palatine canal is usually straight, well-passable, oval in shape. The buccal canals are narrow curved, usually difficult to tool. Often there is a fourth canal in the anterior buccal root. It usually has a narrow mouth that is difficult to access for instrumentation. In some cases, it is isolated, and sometimes in the area of the tooth apex it merges with the main canal and ends with one apical foramen. Average length 22mm (20-24mm), has 3 roots and 3 canals in 56.5% of cases, 3 roots and 4 canals in 42.5%, 4 roots and 5 canals in 2%. As a rule, the mouth of the fourth canal is located on the line connecting the mouth of the buccal and palatal canals at a distance of 1.5-2 mm from the buccal. Note: The pulp chamber is triangular rather than rectangular, with the corners forming the canal orifices. The bottom is convex. If there is a fourth canal, it is located in the bucco-mesial (AM) root. In 70% of cases, these channels are connected to the apex. The longest palatal canal is straight, but in 55% of cases in the apical third it deviates to the buccal side. The buccal-distal canal (SD) is the shortest and has a distal direction. In the area of trifurcation, additional canals are observed in 18% of cases. The access cavity should be formed in the mesial half of the crown.

The second molar of the upper jaw.(Fig. 14). There are 4 variants of the structure of the tooth cavity, respectively, 4 variants of the anatomical shape of its crown. The most common are the 1st and 4th variants of the structure of the tooth

cavity. The 1st variant of the structure of the cavity repeats the shape of the cavity of the first molar of the upper jaw.

The 2nd and 3rd options are more rare. The cavity of the teeth in these cases has the shape of a rhombus, elongated in the anteroposterior direction. The canal mouths approach each other and are located almost on one straight line. The arch of the tooth cavity in the 2nd version has four depressions, respectively, four cusps.

The anterior buccal cavity is more pronounced. The arch of the cavity in the 3rd version has three depressions, corresponding to three tubercles, the anterior cheek depression is also the most pronounced. The 4th variant of the structure of the tooth cavity has a triangular shape, corresponding to the three-tubercle of the chewing surface. The arch of the cavity is projected at the level of the neck of the tooth and has three indentations corresponding to the cusps. The anterior buccal cavity is more pronounced. The bottom of the cavity of the tooth of the second molar of the upper jaw is located above the level of the neck of the tooth. There are three root canals: two buccal (anterior and posterior), one palatine. The palatine canal is wide, well passable, the cheeks are narrow, curved, often have lateral openings. Average length 21mm (19-23mm). Typically, a tooth has 3 roots and 3 canals in 65% of cases, 3 roots and 4 canals in 35% of cases.

Note: the cavity of the tooth repeats the above patterns for the first upper molar in a slightly different quantitative ratio. If at the bottom of B6 the canal mouths form an almost isosceles triangle with an apex near the palatine, then at B7 an obtuse triangle is formed. Sometimes in molars with a narrow crown in the mesodistal direction, the canal mouths are located on the same line. There is a uniform curvature of all channels.

The third molar of the upper jaw. The coronal cavity of the tooth is variable in structure, like the tooth itself. Often resembles the shape of the cavity of the tooth of the first or second molar of the upper jaw with three canals (two buccal and one lingual). More than three root canals are possible. Often, the channels merge into one. Due to the structural features and poor access, the third molar presents particular difficulties in endodontic treatment. Average length 18mm (16-20mm). The sizes and shapes of roots and canals are not constant, their number can vary from 1 to 4-6.

The first molar of the lower jaw.(Fig 15). The coronal cavity of this tooth has a vault, a bottom and four walls (buccal, lingual, anterior and posterior). The arch of the cavity is located on the border of the middle and lower third of the crown of the tooth and has five depressions, respectively, five tubercles of the chewing surface. The anterior cheek depression is most pronounced. The bottom of the tooth cavity has the shape of a rectangle, elongated in the anteroposterior direction, with a convex surface. Located at the level of the cervix or slightly below. There are three root canal orifices at the bottom of the tooth cavity. There are two canals in the anterior root,

and one in the posterior root. The entrance to the anterior buccal canal is located directly under the tubercle of the same name. The entrances to the anterior lingual and posterior canals are located under the longitudinal fissure separating the buccal and lingual tubercles. The mouths of the canals form a triangle with the apex at the mouth of the posterior canal. The anterior canals are narrow, especially the anterior buccal. The posterior canal is wide, well passable. Often a tooth has four canals, two of which are located in the anterior root, and the other two are located in the posterior root. The mouths of the channels in this case form a quadrangle. Average length

22mm (20-24mm), usually has 2 roots and 3 canals in 65% of cases, in 29% - 4 canals, in 6% - 2

channel.

Note: the pulp chamber is located in the mesial 2/3 of the crown, has a trapezoidal shape with a wider mesial than distal part. The bottom of the chamber is convex and located below the neck of the tooth. The mouth of the mesio-buccal canal is located under the apex of the corresponding tubercle. The mouth of the mesial-lingual canal is located between the corresponding tubercle and the central occlusal sulcus. The mouth of the distal canal is projected almost at the intersection of the ocunosional grooves. The square shape of the pulp chamber indicates the need to search for a second distal canal. The mesial canals often (84%) have a distal curvature. The mesio-lingual canal is slightly larger in diameter and straighter than the mesial-buccal canal.

The second molar of the lower jaw.(Fig. 16) The cavity of the tooth resembles the shape of the cavity of the tooth of the first molar of the lower jaw. However, the roof of the cavity has four depressions, corresponding to four bumps on the occlusal surface. Compared to the first molar of the lower jaw, the cavity of the tooth is smaller and the distance between the orifices of the root canals is smaller due to the convergence of the anterior and posterior roots. The average length is 21mm (19-23mm), in 13% of cases it has 2 roots and 2 canals, in 77% - 2 roots and 3 canals, in 10% - 2 roots and 4 canals.

Note: all the provisions presented in the notes to H6. also apply to H7. The mouths of the mesial canals H7 can begin from a common slit opening. Both lower molars have a significant lingual inclination with an almost horizontal position of the occlusal surfaces. This sometimes leads to lingual perforation of the tooth.

Mandibular third molar... The cavity of the tooth is variable in structure, repeats the shape of the tooth itself. It often resembles the structure of the tooth cavity of the first or second molar of the lower jaw. However, the number of canals is not constant due to the diversity of the number and location of roots. Roots often grow together to form one canal. Average length 18mm (16-20mm). In most cases, there

are 2 roots, but often they merge into one cone-shaped one. However, the size and shape of the roots are not constant.

OPENING AND EXPANDING THE CAVITY OF THE TOOTH

In endodontic treatment, the tooth cavity is opened and opened. Everyone knows about the need to open the tooth cavity, however, this is not always done. The opening of the cavity of the tooth should provide good access to the mouth of the canals and the absence of overhangs over them. In this case, the doctor is required to have a good knowledge of the topography of the tooth cavity, possible variations in the number of roots and canals.

The second place in terms of error rate belongs to the quality of the opening of the tooth cavity in molars, which is expressed in the preservation of canopies over the mouth of the canal. This is especially often observed in molars of the lower jaw, in which the buccal canal is significantly mixed towards the vestibular (buccal) surface. The presence of a canopy over the mouth of the canal makes it “impassable”, or conditions are created for the instrument to break off in the canal (due to its curvature) during the passage. Access to the orifices of the root canals is provided by a sufficiently wide opening of the tooth cavity. This stage involves:

1. Formation of the tooth cavity, taking into account its anatomical features - size, shape, quantity, location and curvature of root canals.

2. Ensuring the shape of the cavity necessary for the convenience of subsequent manipulations and providing for:

a) open access to the mouths of the canals;

b) if possible - a direct approach to the apical foramen;

c) formation for the applied filling technique;

d) the possibility of complete control over the direction of expanding instruments.

3. Removal of the remaining carious dentin and restorations.

4. Toilet cavity.

Trepanning of the tooth crown is carried out in accordance with the topographic anatomy known for this tooth and confirmed by a diagnostic radiograph. As a rule, trepanation of the upper anterior teeth begins from the oral surface. When opening the cavity of the lower incisors, often two-channel, to find the mouth of the vestibular canal, it is often necessary to partially remove the incisal edge. Trepanning of premolars is performed in the middle of the crown, molars - in the mesial part of the chewing surface. At this stage, conventional burs (fissure with a rounded tip or inverse taper) are used, fixed in a high-speed handpiece. Before trepanation and in its process, it is necessary to palpate the alveolar process in the area of the tooth root, in order to navigate the location of the root and the direction of its canal, it is

undesirable to use a round bur, when working with which it is difficult to clearly determine the direction of its movement. A tooth cavity is considered to be correctly opened and shaped if the walls of the carious cavity or trepanation hole are smoothly transitioned into it and free access to the orifices of all root canals is open.

For the toilet of the tooth cavity, endodontic excavators can be used, which differ from the usual ones in the large length of the working part. The search for the orifices is carried out using hand-held endodontic probes of various shapes. In case of difficulties in finding the mouths of the canals, you can use the methods of transillumination, staining, or the introduction of sodium hypochlorite. Transillumination is carried out from the side of the lingual or buccal wall of the tooth. With sufficient light transmission, the canal orifice bones can be contoured in the form of dark dots. When staining, special indicators are used

the mouths of root canals, or indicators of caries, similar to the first in chemical composition. In the absence of both, liquid plaque indicators can be used. After the dye is introduced into the tooth cavity and washed off, the indicator is retained in the canal orifices in the form of dots of the corresponding color. Sodium hypochlorite is slightly warmed up and injected into the tooth cavity. Within a few minutes, violent gas evolution occurs, after which the liquid becomes transparent and upon close examination, the formation of tiny bubbles at each mouth of the channel can be detected. If it is difficult to find the canal orifice even with very deep preparation (which happens when the cavity of the tooth and canal orifices are obliterated), X-rays can be taken to prevent perforation and confirm the correct direction of the bur. removing the bur from the handpiece and fixing it with cotton balls in the cavity in the position in which it was during preparation. Removal of soft tissues from the canal is performed using a pulpoextractor. The instrument should only be inserted in the straight part of the canal and no deeper than 2/3 of the canal length.

Open the tooth cavity- to create a point communication between the carious cavity and the tooth cavity, or to form an access to the tooth cavity at one point. The progression of the carious process can lead to the opening of the tooth cavity. The communication of the carious cavity with the tooth cavity can be determined by probing.

Open the tooth cavity- to remove the arch of the tooth cavity to create access to the root canals. In this case, the cavity of the tooth cannot be expanded and deformed, but the walls and the bottom of the cavity of the tooth should be sufficiently visible. Opening and opening of the cavity of the tooth of each group of teeth have their own characteristics. Most often, these manipulations are performed through the carious cavity. But sometimes it becomes necessary to trepan the crowns of intact teeth. The carious cavity is prepared according to all requirements. The cavity of the tooth is opened with a spherical bur No. 1 or a thin tip of a probe. At the same time, there is a

feeling of "sinking" into the cavity of the tooth. In the incisors and canines, in the presence of carious cavities on the contact surfaces (III and IV classes), they are transferred to the palatal or lingual surface, and then the tooth cavity is opened. In the presence of a carious cavity in the cervical region or in intact teeth, the tooth cavity is opened from the palatal or lingual surface. Trepanning of the tooth crown is performed using

a turbine drill with a diamond or carbide bur. The crown is trepanned in the center of the middle third of its surface. It is unacceptable to trephine the incisors from the incisal edge, which can lead to a break of the vestibular and lingual walls. Trepanation of the intact crowns of the lateral incisors of the upper jaw is performed from the palatal surface in the region of the blind fossa (fovea caecum). When opening the tooth cavity, the direction of the bur is perpendicular to the palatal or lingual surface. Then, when opening the cavity of the tooth, the direction of the bur is changed to a direction parallel to the axis of the tooth.

In the premolars of the upper jaw, the opening of the tooth cavity is performed in the area of the bottom of the carious cavity, located closer to the pulp. In this case, class II carious cavities are transferred to the chewing surface. In an intact tooth and in the presence of a class V carious cavity, the crown of the tooth is trepanned in the middle of the fissure, directing the bur to a more pronounced tubercle. The opening of the tooth cavity is performed in the buccal-palatal direction according to the location of the canal orifices. The location of the bottom of the tooth cavity, which is located above the neck of the tooth, under the gum, is also taken into account. Knowing this is important, since they often create two holes in the fornix of the tooth cavity and take them for the mouths of the canals. It is incorrect to open the tooth cavity in the anteroposterior direction. This often leads to perforation of the contact walls of the tooth. The second premolar of the upper jaw often has one canal. The opening of the tooth cavity is performed in the middle of the fissure, and the opening - in the buccal-palatal direction. Opening a tooth in the premolars of the lower jaw in the presence of carious cavities is performed by analogy with the premolars of the upper jaw. When opening the tooth cavity in the intact first premolar lower jaw, the structure of the occlusal surface is taken into account. On the occlusal surface of the first premolar, there are two cusps connected by a roller, on the sides of which there are two transverse fissures (anterior and posterior). Therefore, the opening of the tooth cavity is performed in the middle of the anterior fissure, directing the bur closer to the buccal tubercle. When opening the tooth cavity, the inclination of the crown to the lingual side with respect to the root is taken into account. Ignoring this point can contribute to the perforation of the lingual wall. The cavity of the tooth in the premolars of the lower jaw has a rounded shape. In the second premolars of the lower jaw, on the occlusal surface, there are two tubercles of the same height, separated by

a groove. Opening and opening of the tooth cavity is performed in the middle of the groove. The open tooth cavity has an oval, rounded shape. The principle of opening the tooth cavity in the molars of the upper and lower jaws in the presence of a carious cavity is the same as in the premolars. The opening of the tooth cavity of the first molar of the upper jaw of an intact tooth is performed in the anterior fissure towards the anterior buccal tubercle, possibly without affecting the ridge connecting the anterior palatine and posterior buccal tubercles. With a significant deposition of replacement dentin in the tooth cavity, it can be opened towards the widest palatine canal. The opening of the tooth cavity is performed in the buccal-palatal direction of the bur, respectively, to the buccal and palatal orifices of the canals. The greatest difficulties arise when opening and opening the tooth cavity of the second and third molars of the upper jaw. It should be remembered about four variants of the structure of the crowns of the second molars, which in some cases are extended in the anterior-posterior direction by analogy with the tubercles. Opening of the tooth cavity of intact lower molars is performed in the middle third of the longitudinal fissure towards the anterior buccal tubercle. When obliterating the tooth cavity, opening it can be performed in the direction of the posterior canal. The opening of the tooth cavity of the lower molars is performed in the anteroposterior direction. Opening the tooth cavity in the bucco-lingual direction is an error. which in some cases are extended in the anterior-posterior direction by analogy with tubercles. Opening of the tooth cavity of intact lower molars is performed in the middle third of the longitudinal fissure towards the anterior buccal tubercle. When obliterating the tooth cavity, opening it can be performed in the direction of the posterior canal. The opening of the tooth cavity of the lower molars is performed in the anteroposterior direction. Opening the tooth cavity in the bucco-lingual direction is an error. which in some cases are extended in the anterior-posterior direction by analogy with tubercles. Opening of the tooth cavity of intact lower molars is performed in the middle third of the longitudinal fissure towards the anterior buccal tubercle. When obliterating the tooth cavity, opening it can be performed in the direction of the posterior canal. The opening of the tooth cavity of the lower molars is performed in the anteroposterior direction. Opening the tooth cavity in the bucco-lingual direction is an error.

DETECTION OF CHANNEL ORHES

This stage is important not so much in terms of the effectiveness of treatment, as in creating convenience in work during the passage and filling of the canals. The buccal canals in the upper and anterior in the lower molars branch off in the form of thin branches, and their search presents significant difficulties. Once they have expanded into funnel-shaped depressions, entry into the canal is greatly facilitated. Expansion of the canal mouth can be done with a spherical bur, however, there are special tools of various diameters with a shortened working part - Gates Glidden and

an elongated working part Largo, with the help of which the canal openings are widened. The expansion of the channel mouths is carried out when operating at low machine speeds.

Lecture number 3

Topic: Preparation of the sick. Radiography in endodontics. Root canal treatment and shaping

3.1. Technological models for education

Lesson time 80min	**Number of students**
Activity type	**Introduce lecture news**
Lecture plan:	***First hour.*** 1.Root canal treatment and shaping 2.Microbiological composition of infected root canals ***Second hour.*** 3.Preparations for chemical expansion of root canals
Objective of the lesson	Inform students, give a full explanation of the treatment and formation of root canals, the microbiological composition of infected root canals., Antiseptics used in drug treatment of root canals
Teaching methods	Conversation, lecture visuals
Activity type	common-collective
Visual aids on the topic	Study guide, lecture material, projector, computer
The setting for the lesson	Methodical equipped classroom
Monitoring and evaluation criteria	Oral survey

3.2 Technological map of lectures

Stages of work	Teacher	Student
1.Preparation stages (10 minutes)	1.Objective of the lesson 2. Preparation of slides for the lecture material 3.Literature on the topic 1. Borovskiy E.V. "Therapeutic dentistry" M., 2006 2. Borovskiy E.V. va boshqalar "Therapeutic stomatology" .- M., 2004 3.Kamilov Kh.P., Mamedova F.M.	Listens and records

	"Davolash stomatologydan" recipe reference book. - 1995. 4. Borovskiy E.V., Barisheva Yu.D., Maksimovskiy Yu.M. "Therapeutic stomatology" .- M .: Medicine, 1998.	
2.Introduction (15 minutes)	***1. Purpose and objectives of the lecture material:*** **Target:** To highlight the treatment and formation of root canals, the microbiological composition of infected root canals., Antiseptics used in drug treatment of root canals **Task:** Inform students, give a full explanation of the treatment and formation of root canals, the microbiological composition of infected root canals., Antiseptics used in drug treatment of root canals **Questions by topic** 1.General instructions for root canal preparation 2.Objectives root canal treatment 3 rinsing the root canal 4.Antiseptics used for drug treatment of root canals	Listen Answers students' questions
3.main stage (45 minutes)	1. Introduction to the topic with slide show	Listen and record
4. Final stage (10 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listens and records

Lecture text

X-RAY DIAGNOSTIC METHODS

Radiography is an important part of endodontic diagnostics and is highly informative. X-ray examination includes intraoral and extraoral radiography, orthopantomography, electroradiography.

The most widely used in endodontic practice

intraoral contact radiographs in various projections, which show 2-3 teeth and the surrounding bone tissue. It is on them that the cortical plates of the hole are most clearly visible. A parallel X-ray technique is preferred, which provides an image with minimal distortion of the tooth size and shows all roots and approximately 2-3 mm of the periapical region.

Recently, digital radiography (radiovisiography) has been used as an alternative to traditional X-ray research, in which, thanks to a specially developed sensor, the use of X-ray film is excluded. The principle of X-ray image formation is based on the luminescence effect and the use of special sensors, recording equipment and a computer. Under the influence of radiation, the sensor transmits information to the computer, which reproduces the image on the screen. The quality of such an image is not inferior to that of a traditional radiograph.

Digital radiography significantly reduces radiation exposure, allows you to instantly decode and analyze the "digital" image, measure, store and transmit it electronically, and also allows the patient to see the image of his tooth on the monitor screen.

The most valuable additional feature of digital radiography is densitometry, if it is used in the dynamics of treatment in the same patient.

Digital radiography allows the creation of a database of complete endodontic reports.

When analyzing radiographs of teeth and periodontium, it is advisable to adhere to the following scheme:

• crown (shape, contours, intensity of the shadow of hard tissues, presence of defects);

• cavity of the crown (presence, absence, shape, size, contours);

• tooth root (number, size, shape, stage of formation, contours, state of the apex);

• root canal (presence, absence, width, features of location, shape, direction, curvature, localization of the apical foramen);

• periodontal gap (width, uniformity);

• compact plate of the alveoli (presence, absence, width, violation of integrity);

• surrounding bone tissue (osteoporosis, destruction, osteosclerosis);

• interalveolar septa (location, shape, safety of the endplate, structure).

When analyzing radiographs, the physician should pay special attention to the width of the periodontal gap, the integrity of the compact plate, and the degree of bone loss or destruction in the periapical region.

Pay attention to the shape, uniformity, clarity of the contours of the destruction focus and its localization relative to the tooth root. Be sure to analyze the nature of the communication between the endodontus and the periodontium.

The width of the periodontal gap at the formed root is uneven throughout from the neck of the tooth to the apex of the root and averages 0.15-0.25 mm.

X-ray examination reveals the intensity of secondary and tertiary dentin formation and the presence of calcification in the form of small discrete dense inclusions or denticles, which are displayed by intense shadows of various widths parallel to the walls of the crown cavity or root canal.

In chronic inflammation of the pulp, the internal resorption of the hard tissues of the tooth ("internal granuloma"), which has the appearance of a rounded, well-defined enlightenment, usually layered on the image of the tooth cavity, is radiographically revealed.

Attention should also be paid to the external resorption of the root apex.

X-ray changes in the cortical plate of the alveoli can be in the form of a small focus of resorption or in the form of its complete disappearance around the apex of the root.

The image of the cortical plates of the alveoli is not the same not only in different persons, but also in the same patient. The thickness of the cortical plates, especially in the periapical region, sometimes slightly differs in different teeth of the same patient.

In assessing the state of the cortical plate of the alveoli, a study of previously performed radiographs of the same tooth can provide significant assistance.

The detection of pathological changes in bone tissue is influenced by the course of X-rays; Knowledge of the peculiarities of their direction and repetition of X-ray patterns with a changed course of the central X-ray beam allow us to resolve the difficulties arising in the diagnosis. The angle formed by the X-ray in relation to the tooth is an important prerequisite for a correct diagnosis.

Anatomical formations such as the chin, incisor, lingual openings, the intermaxillary suture, large bone cells, the mandibular canal and the maxillary sinus can simulate the presence of pathological changes in the bone tissue.

The ability of a dentist to identify and analyze X-ray criteria influencing the outcome of endodontic treatment determines the rationality of the choice of treatment method.

General guidelines for root canal preparation

The term "treatment" includes the expansion, cleaning and shaping of the root canal. When instrumental processing is carried out with the simultaneous use of rinsing solutions, "biomechanical processing" is meant.

Depending on the state of the pulp, pulpectomy of the vital and devital pulp is distinguished.At the same time, the state of the pulp does not significantly affect the appearance and method of treatment of the canal.

Goals root canal treatment

- complete removal of vital and non-vital pulp,
- mechanical removal of microorganisms from the walls of the root canal,
- enhancing the aseptic effect of solutions for washing by expanding the lumen of the root canal,
- giving the root canal the shape necessary for the complete obturation of the root canals Expansion, cleaning and shaping of the root canal is usually carried out simultaneously Cleaning is of the greatest importance, since the remaining organic matter can promote the growth of microorganisms

Root canal treatment begins after determining its working length and appropriate preparation of the working field.Usually, regardless of the state of the pulp (vital or non-vital), the working length of the root canal is 1 mm less than the length of the tooth.The final shape of the root canal depends on the method of further filling of the root canals. When shaping a root canal, it is necessary to adhere to these requirements.

- it is necessary to preserve the apical constriction,
- an apical support must be created in the apex of the root canal,
- from the crown to the apex, the root canal must have a conical shape.For mechanical removal of the infected contents from the canal walls, the canal expansion (regardless of the applied method of treatment) should be performed with an instrument 3-5 sizes larger than the size of the first one, tightly adjacent to the canal walls

When processing the walls of the root of the canal To avoid excessive weakening of the dentinal wall or lateral root perforation, the anatomical features of the root must be taken into account

In the presence of significantly curved roots, the coiled wall should be treated more intensively than the convex one.Even following this recommendation, as a result of the alignment of the canal, the working length often decreases by 0.5 mm or more To avoid damage to the canal wall, the working length is reduced

Cleaning the canal is carried out with endodontic instruments in a humid environment, which necessitates frequent rinsing of the canal with appropriate solutions

Root canal washing

In order to completely remove the remains of tissue, detritus and microorganisms remaining in the dentinal tubules, lateral canals or other inaccessible places, it is necessary to flush the canal with appropriate solutions.

For this purpose, it is recommended to use such agents as a solution of sodium chloride, hydrogen peroxide, sodium hypochlorite, ethylenediaminetetraacetic acid

(EDTA), organic acids orethyl alcohol channel The canal flushing agent must have the following properties

- low toxicity,
- bactericidal action,
- the ability to dissolve the vital and non-vital pulp,
- low level of surface tension

The only agent that adequately meets these requirements is sodium hypochlorite (NaOCI), containing undissociated HOC1 groups, which have an oxidizing and chlorinating effect.

Usually sodium hypochlorite is used in the form of 0.5-5.0% aqueous solutions.The antibacterial effect of this concentration range is approximately the same

Sodium hypochlorite dissolves tissues well.With its excess, almost complete dissolution of both vital and non-vital pulp occurs

Using only sodium hypochlorite, it is impossible to remove the lubricated layer covering the dentin For this, chelates such as EDTA or citric acid are used.However, the advisability of removing the lubricated layer before filling the root canal has not been completely clarified

Also, the positive effect of periodic flushing of the channel with hydrogen peroxide in order to release active oxygen and perform bleaching has not been proven.

Efficiency washing with sodium hypochlorite depends on the depth of its penetration into the root canal, therefore, on the size of the canal lumen, the amount of hypochlorite solution, and the duration of its exposure.

The canal is washed using an endodontic syringe equipped with a blunt, slightly bent cannula The solution is injected in such a way as to ensure deep penetration of the drug into the root canal and at the same time to exclude it from getting behind the apex

To eliminate irritation of the oral mucosa or swallowing the solution when rinsing, use a rubber dam

Root canal treatment methods using hand instruments

Root canal preparation with hand instruments depends on the instruments used or on the desired final canal shape.

Depending on the processing method, due to the final shape of the root canal, distinguish between step-back- (step back) and step-down-technique (step down) It is difficult to clearly distinguish between them, since various combinations of these methods are often used

It should be noted that traditional methods, in which drills are used, are predominantly used for "processing straight canals with a circular cross-section, astep-back and step-down techniques using K-files for processing curved canals."

Traditional ways

Traditionally, the root canal is treated with tools of increasing size throughout the entire working length.The treatment is carried out using both drills and Hedstrom drills and drills alternately

A small drill is inserted into the canal, turning it by a quarter or a half turn.Then the drill is removed from the canal and cleaned This operation is carried out until a channel of the required diameter is obtained.The operation is repeated using instruments of a gradually increasing size

Using this method, it is recommended to alternately use drillers and Headstrom drills of the same size.As a result of using only drills, sawdust can accumulate in the upper third of the canal and block the apical opening.To avoid this, recapitulation is carried out, in which, to remove sawdust, a smaller one or two sizes of drill is introduced into the canal

An advantage of traditional canal treatments is that the prepared canal has a circular cross-section. Thanks to this, filling is possible using standard gutta-percha pins

However, traditional processing methods also have significant disadvantages.

In canals with an oval and dumbbell-shaped section, it is difficult to prepare some sections of the canal walls.In the process of giving the canal walls a rounded shape, there is a high probability of lateral perforation

Using traditional methods of processing curved root canals, already at the initial stage of instrumental processing, one should take into account the possibility of damage to the canal walls or deviations from the initial direction of the canal in the apical third (Figures 13-14 and 13-15)

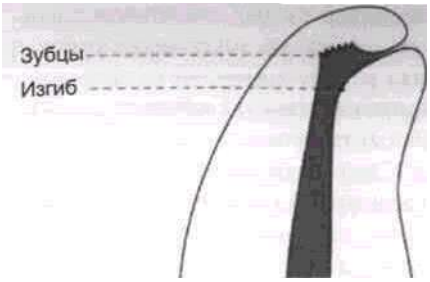
During the treatment of the root canal, due to the slipping of the tip of the instrument during rotation, the so-called "funnel-teeth" effect can be formed, which makes it difficult to fill the root canal correctly. (Figure 13-16)

If, when processing the canal, mainly drills are used, after a smooth, without jerking input of which, the walls of the canal are scraped off, then this method is called the "drill method". First, a small drill is inserted into the canal, which should freely enter the entire working length.The walls of the canal are processed until the next larger drill enters the canal freely, along the entire working length.The walls of the incorrectly formed canal are cleaned by circular processing (Fig. 13-17 and 13-18)

The size of the instruments for final processing depends on the anatomical features of the canal and the proposed method of filling

The advantages of this method are the thoroughness of the cleaning of the root canals and the possibility of processing malformed ^. channels

The disadvantage of this method is that in order to prevent blockage of the apical opening by the scraped content of the canal, it is necessary to frequently recapitulate.With an incorrectly formed root canal, more labor-intensive filling methods should be used



Rice.13-16. Funnel-teeth effect when processing curved canals The use of insufficiently flexible or non-curved instruments anteriorly leads to the formation of teeth near the apex, followed by narrowing (funnel)

Disadvantages of traditional methods of processing In case of an insufficiently round shape of the canal section, some of its sections are untreated, and in other sections of the canal, an excessive amount of healthy dentin is removed

Rice. 13-18. Circular processing Using this method, you can effectively process all areas of an incorrectly formed canal

Step-back and step-down technique

Using traditional methods of treatment, in most cases it is impossible to fulfill the necessary requirements for the correct formation of the root canal.

The channel of the original conical shape must be formed using only the step-back technique.

After finishing the processing of the apical opening of the canal with a tool 3-5 sizes larger than the first tool inserted over the entire working length and fixed by the

canal walls, the introduction of subsequent, increasing in size instruments (depending on the width

rins of the canal) is carried out with a gradual decrease in the working length. In straight canals, the working length of the instrument is gradually reduced by 0.5 mm, in curved canals by 1 mm (Fig. 13-19).

Advantage step-back-technique, in comparison with traditional methods, is that instruments, the degree of flexibility of which decreases with increasing size, do not enter into the area of the greatest bend of the canal, preventing excessive removal of the substance from one side of the canal walls and the formation of the "funnel- teeth ".

An improvement in the step-back technique can be considered the expansion of the coronal third of the canal after the completion of the apical foramen processing with hand instruments. This improves access to the root canal, thus avoiding unnecessary use of large instruments.

Significantly curved canals are advisable to process from top to bottom, that is, with the step-down or crown-down technique (“down from the crown”). Using this method, after finishing the treatment of the upper two-thirds of the canal with Gates-Glidden burs or gradually decreasing drills, the lower third of the canal is treated with a step-back technique. Further, for processing the lower third of the canal, K-files are used, which are inserted into the canal by light pressure, gradually reducing their size until the working length is reached.

Using this technique, canals with a bend angle of more than 60 ° can be processed. This complex method is only recommended for endodontics.

Along with the above-mentioned methods of processing the root canal with hand instruments, there are others in which both mechanical instruments and various combinations of mechanical processing, ultrasonic or sound systems are used.

As an aid to endodontic treatment, it is advisable to use ultrasound systems in combination with various hand instruments.

The use of the laser as an aid in root canal cleaning is currently not well researched, so its use in daily dental practice is premature.

As an example of root canal treatment, methods for shaping a conical root canal with hand instruments are described below.

Rice. 13-19. Tapered root canal preparation step-back technique

Lecture number 4

Topic: Microbiological composition of the infected root canal system. Antiseptics used in the medical treatment of the root canal system.

4.1. Technological models for education

Lesson time 80min	**Number of students**
Activity type	**Introduce lecture news**
Lecture plan:	***First hour***... **1.** Microsurgery in endodontics. Preparation of the sick. Indications and contraindications. ***Second hour***... **2.** Dentist tactics when working with poorly passable canals. Errors and complications in endodontics
Objective of the lesson	Inform students, give a full explanation of the materials for microsurgery in endodontics, patient preparation, etc.provision and contraindications
Teaching methods	Conversation, lecture visuals
Activity type	common-collective
Visual aids on the topic	Study guide, lecture material, projector, computer
The setting for the lesson	Methodical equipped classroom
Monitoring and evaluation criteria	Oral survey

4.2 Technological map of lectures

Stages of work	Teacher	Student
1.Preparation stages (10 minutes)	1.Objective of the lesson 2. Preparation of slides for the lecture material 3.Literature on the topic 1. Borovskiy E.V. "Therapeutic dentistry" M., 2006 2. Borovskiy E.V. va boshqalar	Listens and records

	"Therapeutic stomatology" .- M., 2004 3.Kamilov Kh.P., Mamedova F.M. "Davolash stomatologydan" recipe reference book. - 1995. 4. Borovskiy E.V., Barisheva Yu.D., Maksimovskiy Yu.M. "Therapeutic stomatology" .- M .: Medicine, 1998.	
2.Introduction (15 minutes)	***1. Purpose and objectives of the lecture material:*** **Target:** Illuminate materials for microsurgery in endodontics, patient preparation, pprovision and contraindications **Task:** Inform students, give a full explanation of the materials for microsurgery in endodontics, patient preparation, etc.provision and contraindications **Questions on the topic**	Listen Answers students' questions
3.main stage (45 minutes)	1. Introduction to the topic with slide show	Listen and record
4. Final stage (10 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listens and records

Of the fluids in endodontics, the most commonly used drugs arebased on ethylenediaminetetraacetic acid (EDTA). This group also includes Trilon B - disodium salt. EDTA and tetacin calcium disodium EDTA.

1. *Methodology*chemical expansion is as follows. After drying the tooth cavity with a pipette or a pair of tweezersa small amount of the drug solution is added to the canal orifices. Then the mechanical expansion of the canals is started with endodontic instruments. Chemical and mechanical action is alternated until the desired result is obtained.
2. With strong calcification of dentin in the tooth cavity of the resta cotton swab moistened with a decalcifying agent under a bandage is applied for up to 7 days, after which the canals are mechanically dilated.
3. Another group of drugs used for the chemical expansion of root canals is gels. They contain EDTA,viscous substances to facilitate the movement of instruments in the canal, and flotation agents to help remove dentin

particles.

4. *Method of work:*a small amount of gel is applied to the endodontic instrument and inserted into the canal. Immediately after thisth start machining. The procedure is repeated several times. After the canal is widened, it is thoroughly rinsed with sodium hypochlorite solution or distilled water, medically treated and sealed in the usual way. Please also note that you should not leave the gel in the canal until your next visit.

Preparations for chemical expansion of root canals

Active substance	Preparation, manufacturer
EDTA solution	"Largat ultra" (Septodont) "Edetat solution" (Pierre Rolland) "Root Canal Enlarger" (Produits Dentaires SA) "Chela-Jen Liguid" (Alpha-Beta Medical Supply inc.) "Endofree" (Dencare) "MD-Cleanser" (Meta Biomed Co., Ltd) "Liquid for chemical expansion root canals "(Omega)" Channel E " (Rainbow-R)
Lemon solution and propionic acids	**"Verifix" (Spad)**
Gels based on EDTA	"SapaG" (Septodont) "HPU15" (Spad) "File-Eze "(Ultradent)" Glyde "(Maillefer / Dentsply) Chela-JenGel (Alpha-Beta Medical Supply inc.) "RC-prep" (Premier) "Kanal-Dent. Gel for processing channels "(VladMiVa)" Ka-nal-Glide "(Rainbow-R)

MEDICAL PROCESSING LIQUIDSKI (FLUSHING) ROOT CANALS

In endodontics, for medical treatment and washing Strong antiseptics are usually used for root canals.

Substances used for drug treatmentroot canals must meet the following requirements:

1) have a bactericidal effect on the associations of microorganisms in root canals;

2) be harmless to periapical tissues;

3) do not have a sensitizing effect on the microorganism;

4) not to cause the appearance of resistant forms of organisms;

5) have a quick action and penetrate deeply into the den- muddy channels;

6) do not lose its effectiveness in the presence of organicchemical substances;

7) not have an unpleasant smell and taste;

8) clean the lumen of the canal from organic residues, facilitate their evacuation from the canal;

9) be chemically resistant and remain active during prolonged storage.

There are several ways of medicinal canal treatment:

1) antiseptic treatment with a cotton turunda wound on a root needle and soaked in solution medicinal substance;

2) antiseptic treatment with paper pins soaked in a solution of medicinal drug;

3) rinsing the root canal with a solution of medicinalsubstances from a syringe through a special endodontic needle. The last method is the most effective. Flushing

channel from the syringe through the eAn ndodontic needle is produced as follows:

1. The tooth to be processed is covered with rollers, a saliva ejector or vacuum cleaner is placed next to it, which will quickly remove the wash solution along with the decay product.

2. The canal is flushed through a special endodontic needle. Endodontic needles - thin, longThey have a blunt tip and lateral openings so that the fluid supplied under pressure does not fall into the periapical region, but comes out into the wider sections of the canal. To reduce the risk of solution excretion beyond the apex, the tip of the needle should be located 3-5mm from the apical foramen. Before inserting the needle into the canal, it is bent at the desired angle and a stop disk is put on to control the depth of immersion into the canal.

3. The antiseptic solution is injected into the canal with a syringe at low pressure. Total for washingi root canal in the process of endodontic treatment, 10-20 ml of antiseptic solution is required. At the same time, the antiseptic has a bactericidal effect, washing out of the canal necrotic tissues, decay products, dentin sawdust, including from areas inaccessible for mechanical processing.

4. Before filling to remove antisep residuesit is recommended to rinse the channel with distilled water and then dry it with paper points.

Next, we will consider the groups of drugs that are most often used fordrug treatment of root canals.

Classification of medicinal products for processingki root canals

I. Nonspecific.

1. Oxygenated. 3% hydrogen peroxide solution, etc.

2. Halogenated preparations.

A. Chlorine.

1-2% chloramine solution, 0.2% chlorhexidine bigluconate solution, 3-5% sodium hypochlorite solution (dissolvesnecrotic tissue, has a bactericidal effect on gram-

positive and gram-negative bacteria, fungi and viruses).

B. Iodine-containing.

1% solution of iodinol is a complex compound of iodine with a

livinyl alcohol (has a bactericidal, fungicidalaction, accelerates tissue regeneration).

3. Preparations of the nitrofuran series

0.5% furacilin solution (has a wide spectrum of action, has an anti-exudative effect). 4. Quaternary ammonium compounds

0.1% decamine solution (has a bactericidal effecton spore-forming microorganisms, yeast-like fungi).

5. 20% DMSO solution (dimexide, dimethyl sulfoxide). Provides antiseptic, anti-inflammatory, analgesic, bacteriostatic, fungicidal action.

6. Proteolytic enzymes. Chymopsin, trypsin, chymotrypsin. Possess anti-inflammatory, decongestant

action, break down necrotizimasses, liquefy viscous secretions, especially immobilized proteolytic forms that remain active for 3 to 6 days.

7. Protein enzyme.

0.1% lysozyme solution. Contained in body tissues.

Anti-inflammatory, non-toxic, stisimulates the nonspecific reactivity of the body.

8. Ortofen.

It has a strong anti-inflammatory effect.

II.Specific

Antibiotics and their combinations with proteolytic enzymes, antibacterial agents (trichopolum).

III.Special

Complex solutions, hemin, DDTA, citric and propionic acids.

For the chemical expansion of channels according to the data of A.N. Nikolaev and L.M. Tsepova (2004) use two types of drugs: liquids and gels

Preparations for chemical expansion of root canals

Of the fluids in endodontics, the most commonly used drugs arebased on ethylenediaminetetraacetic acid (EDTA). This group also includes Trilon B - disodium salt. EDTA and tetacin calcium disodium EDTA.

*Methodology*chemical expansion is as follows. After drying the tooth cavity with a pipette or a pair of tweezersa small amount of the drug solution is added to the canal orifices. Then proceed to the mechanical expansion of the canals with endodontic instruments. Chemical and mechanical action is alternated until the desired result is obtained.

With strong calcification of dentin in the tooth cavity,they put a cotton swab moistened with a decalcifying agent under a bandage for up to 7 days, after which a mechanical expansion of the canals is performed.

Another group of drugs used for the chemical expansion of root canals is gels. They contain EDTA, smaViscous agents to facilitate the movement of instruments in the canal and flotation agents to help remove dentin particles.

*Method of work:*a small amount of gel is applied to the endodontic instrument and injected into the canal. Immediately after thisth start machining. The procedure is repeated several times. After the canal is widened, it is thoroughly rinsed with sodium hypochlorite solution or distilled water, medically treated and sealed in the usual way. Please also note that you should not leave the gel in the canal until your next visit.

So, 0.01 - 0.03% chlorhexidine solution has an active effect on the microflora of the root canalsv. A 2-3% hydrogen peroxide solution is successfully used.

Sodium hydrochloride has proven itself well and has received wide distribution, a 2.5-3% solution of which haseternal bactericidal action. In addition, sodium hydrochloride dissolves the organic content of the canals and the dentin base, which promotes canal expansion.

The canal is processed before filling. ForThis solution is drawn into an endodontic syringe, the needle is inserted to the entire depth of the canal and washed without much pressure. Then the canal is washed with distilled water, after which it is dried with paper points and the canal is ready for filling.

Sodium hydrochloride solution produced by a number of companies,may have special names. Thus, the Septodont company produces a stabilized solution with a 3% content of purified sodium hydrochloride called "parkan".

For antiseptic treatment of root canals, solutions are widely used: Kresofen, Endontin, Pulperil Kresodent and channel des AO Vlad Mi Va gel Grinazol, Endocal, iodoform resorbing paste - Tempopor, etc.

Lecture number 5

Topic: Pulpitis. Classification. Etiology. Pathogenesis.

5.1 Flow chart of lectures

Lesson time 80 min	**Number of students**
Activity type	**Introduce lecture news**
Lecture plan:	***First hour.*** 1The anatomical structure of the pulp. The histological structure of the pulp. Pulp physiology. Pulp functions. 2. Changes in the pulp in various diseases. ***Second hour.*** 3.Pulpitis. Etiology, pathogenesis and classification of pulpitis.

	4.Changes in the pulp in diseases of the dentition and general diseases of the body
Objective of the lesson	Inform students, give a full explanation the structure and functions of the pulp for variousdental pain, etiology, pathogenesis and classification of pulpitis
Teaching methods	Conversation, lecture visuals
Activity type	common-collective
Visual aids on the topic	Study guide, lecture material, projector, computer
The setting for the lesson	Methodical equipped classroom
Monitoring and evaluation criteria	Oral survey

1.1. Technological models for education

Stages of work	Teacher	Student
1.Preparation stages (10 minutes)	1.Objective of the lesson 2. Preparation of slides for the lecture material 3.Literature on the topic 1. Borovskiy E.V. "Therapeutic dentistry" M., 2006 2. Borovskiy E.V. va boshqalar "Therapeutic stomatology" .- M., 2004 3.Kamilov Kh.P., Mamedova F.M. "Davolash stomatologydan" recipe reference book. - 1995. 4. Borovskiy E.V., Barisheva Yu.D., Maksimovskiy Yu.M. "Therapeutic stomatology" .- M .: Medicine, 1998.	Listens and records
2.Introduction (15 minutes)	***1. Purpose and objectives of the lecture material:*** **Target:** To illuminate the structure and functions of the pulp at various timesdental pain, etiology, pathogenesis and classification of pulpitis **Task:** Inform students, give a full explanation the structure and functions of the pulp for variousdental pain, etiology, pathogenesis and classification of pulpitis **Questions by topic**	Listen Answers students' questions

	1. The anatomical structure of the pulp. 2. Physiology of the pulp. Pulp functions 3. Etiology of pulpitis. 4.Classification of pulpitis	
3.main stage (45 minutes)	1. Introduction to the topic with slide show	Listen and record
4. Final stage (10 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listens and records

Lecture text

Pulpitis is a response of the pulp to the action of any etiological factors, which are characterized by the destruction of pulp tissue (alteration), a vascular reaction (exudation and immigration), the proliferation of new cellular elements (proliferation).

Etiology and pathogenesis:

There are 4 main etiological factors for the occurrence of pulpitis:

I. Biological - the action of microbes, toxins. Microflora in various associations: streptostaphylococcal. Routes of infection:

1. Direct path, i.e. directly from the carious cavity through the dentinal tubules, the infection penetrates into the tooth cavity, causing an infectious inflammation.

2. Retrograde path, i.e. with local inflammatory processes (parodantitis, abscesses, phlegmon, osteomyelitis, furunculosis, etc.), infectious inflammation occurs in intact teeth.

II. Chemical - the action of acids, alkalis, the imposition of toxic seals without gaskets.

III. Physical - action temperature, radiation, electric current, improper preparation of the tooth.

IV. Mechanical-trauma, bruises, opening of the pulp-tooth horn.

The last 3 factors cause aseptic inflammation.

PATHOGENESIS

In the transition of the pulp from a normal state to inflammation, 3 stages can be conventionally distinguished:

I. The stage of functional and chemical changes that

can be detected by biochemical and histochemical methods. There is a decrease in the activity of respiratory enzymes, an increase in the activity of alkaline phosphatases.

II. The stage of pronounced morphological changes is characterized by a qualitative restructuring of all components of the pulp, which is manifested by a

change in protein formation, transcapillary metabolism, phagocytosis, and the energy potential of pulp cells. Quantitative restructuring is associated with an increase in the number of macrophages, plasma cells, neutrophilic granulocytes. If there is a different effect of protective mechanisms and factors of adverse effects against the background of a healthy organism, then the inflammation of the pulp may not develop. The factors that reduce the body's defenses include age, heredity, malnutrition, past and concomitant diseases, hormonal activity disorders, sensitization, the state of periodontal tissues, the intensity of caries development, the degree of functional chewing load.

If the irritating factors are not eliminated and the pulp does not cope with the action of the damaging agent, the process goes into the 3rd stage - inflammation itself.

III. Acute pulpitis develops as a typical inflammatory reaction of connective tissue with edema and hyperemia, with the formation of focal or diffuse small-cell infiltration and the formation of serous and then purulent exudate.

The development of chronic pulpitis is facilitated by impaired blood flow, stasis, vascular thrombosis and various degrees of destruction of the pulp. Chronic pulpitis usually develops as an outcome of acute, but primary chronic pulp inflammation may develop.

Long-term action of damaging agents of relatively low intensity may result in pulp necrosis.

CLASSIFICATION OF PULPITES

In endodontics, there are several dozen systematization of pulp diseases. Their abundance can be explained by the variety of types of pulp lesions, the difference in the principles of their creation: by etiology, clinic, pathomorphological signs, etc.

The review shows that the most complete list of pulp lesions contains the classification proposed by BM Mogilnitsky and AI Evdokimov (1925), which indicates four categories of pulp diseases with an indication of the nature of the pathological process.

Vascular disorders: 1) hemorrhage; 2) hyperemia.

Inflammation.

Exudative inflammation: 1) superficial pulpitis; 2) partial pulpitis simple (serous); 3) general purulent pulpitis (abscess, pulp phlegmon).

Proliferative inflammation: 1) fibrous pulpitis; 2) granulomatous pulpitis.

III '. Regressive processes: 1) pulp atrophy; 2) pulp necrosis;

3) gangrene of the pulp (partial, general); dry and wet.

IV. Progressive processes: 1) denticles.

The most popular classification of E.M. Hofung (1927) is based on the idea that different clinical manifestations of pulpitis are based on a single pathological process:

inflammation of the pulp with the transition in acute from the serous stage to purulent, in the chronic course - to proliferation and then to necrosis (pulp gangrene).

I. Acute pulpitis: 1) partial; 2) general; 3) general purulent.

II. Chronic pulpitis: 1) simple; 2) hypertrophic; 3) gangrenous.

V Creating the classification of pulpitis, E.E. Platonov (1968) took into account the errors of the previous one, highlighting the following forms of pulpitis:

Acute pulpitis: 1) focal; 2) diffuse.

Chronic pulpitis: 1) fibrous; 2) gangrenous; 3) hypertrophic.

III. Exacerbation of chronic pulpitis.

The clinical manifestations of pulp inflammation are diverse, due to both the general condition of the body and local conditions in the oral cavity.

The analysis of patients' referrals to the polyclinic for pulpitis showed that 38% of cases are for acute forms of pulpitis, and 62X for chronic forms. Clarification of the diagnosis of pulp disease is of great importance in the clinic "as it determines the choice of the method and the effectiveness of the treatment.

Making the correct diagnosis largely depends on the thoroughness and adherence to the sequence of the patient's examination; upon questioning, you can find out if the patient has concomitant diseases that may be accompanied by irradiation of pain in the teeth and jaw: nervous system disorders (neuralgia, neuritis of the second and third branches of the trigeminal nerve, gangliolitis, dental plexayagia, angina pectoris, hypothyroidism 9 hyperthyroidism).

An exacerbation of chronic pulpitis may be preceded by an increase in functional load, tooth trauma, filling the carious cavity of the tooth with compressed food, hypothermia, overwork, emotional and nervous tension, surgery, viral and bacterial diseases.

Lecture number 6

Theme: Clinic, diagnostics and differential diagnostics of various types of pulpitis.

2.1 Technological map of lectures

Lesson time 80 minutes	**Number of students**
Activity type	**Introduce lecture news**
Lecture plan:	***First hour.*** 1 Diagnostics of various types of pulpitis ***Second hour.***

	DIF diagnostics of various types of pulpitis.
Objective of the lesson	Inform students, give a full explanation Toline, diagnostics and differential diagnostics of various types of pulpitis.
Teaching methods	Conversation, lecture visuals
Activity type	common-collective
Visual aids on the topic	Study guide, lecture material, projector, computer
The setting for the lesson	Methodical equipped classroom
Monitoring and evaluation criteria	Oral survey

2.1. Technological models for education

Stages of work	Teacher	Student
1.Preparation stages (10 minutes)	1.Objective of the lesson 2. Preparation of slides for the lecture material 3.Literature on the topic 1. Borovskiy E.V. "Therapeutic dentistry" M., 2006 2. Borovskiy E.V. va boshqalar "Therapeutic stomatology" .- M., 2004 3.Kamilov Kh.P., Mamedova F.M. "Davolash stomatologydan" recipe reference book. - 1995. 4. Borovskiy E.V., Barisheva Yu.D., Maksimovskiy Yu.M. "Therapeutic stomatology" .- M .: Medicine, 1998.	Listens and records
2.Introduction (15 minutes)	***1. Purpose and objectives of the lecture material:*** **Target:** Illuminate Toline, diagnostics and differential diagnostics of various types of pulpitis **Task:** Inform students, give complete knowledgeline, diagnostics and differential diagnostics of various types of pulpitis **Questions by topic**	Listen Answers students' questions

3.main stage (45 minutes)	1. Introduction to the topic with slide show	Listen and record
4. Final stage (10 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listens and records

Acute forms of pulpitis.

For the acute form of pulpitis, the following four symptoms are characteristic:

1) "spontaneous" pain that occurs without exposure to external stimuli. The intensity of the pain attack, its frequency depend on the severity of the clinical course of the inflammatory process: the action of stimuli - mechanical, chemical and temperature - leads to a prolonged pain attack. It is known that in case of caries, these stimuli cause short-term pain, which disappears immediately after the stimulus stops acting. With pulpitis, on the contrary, the painful attack continues for some time even after the removal of the stimulus. A painful reaction with pulpitis usually arises from exposure to very weak stimuli. So, if a healthy pulp perceives heat at a temperature of 50 -60 ° C and feels cold at 15-20 ° C, then the range of temperature fluctuations to which the inflamed pulp responds is significantly narrows and irrigation of the tooth with water at a temperature of 28-EO ° C already causes pain; increased pain at night is characteristic of acute pulpitis and exacerbation of chronic pulpitis. It is known that the symptom of pain that accompanies any disease is perceived more strongly at night than during the day. This is due to the predominance of the activity of the parasympathetic nervous system over the sympathetic at night, the paroxysmal nature of pain with painless intervals is characteristic of acute pulpitis and exacerbation of chronic pulpitis. This alternation is probably related to the adaptive ability of the body to perceive prolonged pain, unrestrained nervous system, periodic compressed nerve receptors as a result of edema and pulp. increased pain at night is characteristic of acute pulpitis and exacerbation of chronic pulpitis. It is known that the symptom of pain that accompanies any disease is perceived more strongly at night than during the day. This is due to the predominance of the activity of the parasympathetic nervous system over the sympathetic at night, the paroxysmal nature of pain with painless intervals is characteristic of acute pulpitis and exacerbation of chronic pulpitis. This alternation is probably due to the adaptive ability of the body to perceive prolonged pain, loss of exhaustion of the nervous system, periodic compressed nerve receptors as a result of edema and pulp. increased pain at night is characteristic of acute pulpitis and exacerbation of chronic pulpitis. It is known that the symptom of pain that accompanies any disease is perceived more strongly at night than during the day. This is due to the predominance of the activity of the parasympathetic nervous system

over the sympathetic at night, the paroxysmal nature of pain with painless intervals is characteristic of acute pulpitis and exacerbation of chronic pulpitis. This alternation is probably due to the adaptive ability of the body to perceive prolonged pain, loss of exhaustion of the nervous system, periodic compressed nerve receptors as a result of edema and pulp. This is due to the predominance of the activity of the parasympathetic nervous system over the sympathetic at night, the paroxysmal nature of pain with painless intervals is characteristic of acute pulpitis and exacerbation of chronic pulpitis. This alternation is probably due to the adaptive ability of the body to perceive prolonged pain, loss of exhaustion of the nervous system, periodic compressed nerve receptors as a result of edema and pulp. This is due to the predominance of the activity of the parasympathetic nervous system over the sympathetic at night, the paroxysmal nature of pain with painless intervals is characteristic of acute pulpitis and exacerbation of chronic pulpitis. This alternation is probably related to the adaptive ability of the body to perceive prolonged pain, unrestrained nervous system, periodic compressed nerve receptors as a result of edema and pulp.

Acute focal pulpitis(filpitis acu1a focalis). Acute focal pulpitis is the initial stage of pulp inflammation, and its focus is usually localized in the area closest to the carious cavity. The duration of this stage does not exceed 2 days.

The patient complains of the occurrence of intense pains about all types of stimuli, in contrast to dental caries, which is also characterized by the appearance of pain from external stimuli of lesser strength and does not disappear after the removal of the stimulus. Pain can occur spontaneously - without the influence of an apparent cause. The frequency and duration of pain attacks are variable: they can last 10-30 minutes, but in most cases no more than an hour. An attack of pain is replaced by a painless period lasting several hours. The patient usually correctly points out the tooth that is bothering him, which indicates the absence of pain irradiation. At night, the pain is "as a rule" more intense.

On examination, there are usually no external changes on the face. Percussion is usually painless.

Differential diagnosis. Acute focal pulpitis must be differentiated from deep caries, acute diffuse and chronic fibrous pulpitis, and papillitis.

Acute diffuse pulpitis(filpitis acu1a cdiffusa). Acute focal pulpitis with its characteristic symptoms lasts 1-2 days, after which the inflammatory process spreads to the coronal and root pulp and is regarded as acute diffuse pulpitis.

The patient complains of prolonged painful attacks with small painless intervals - intermissions, lasting no more than 30-40 minutes. Sometimes the pain does not disappear, but only subsides. Typical persistent night pain, as well as prolonged pain from irritants, sometimes cold soothes the pain. The duration of the pain is from 2 to

14 days. The pain is not localized, but radiates along the branches of the trigeminal nerve: in case of pulpitis of the teeth of the upper jaw - in the temple, superciliary, zygomatic regions "in the teeth of the lower jaw.

All types of irritants cause increased pain. When an abscess forms, the cold soothes the pain. The same effect in this case is given by perforation of the fornix, the cavity of the tooth, accompanied by the release of exudate.

According to X-ray data, a carious cavity is often determined, there are no changes in the periodocte.

The electrical excitation of the pulp is reduced along the entire bottom of the carious cavity and from all tubercles to 30-40 μA and even 50-60 μA.

Differential diagnosis. Acute diffuse pulpitis must be differentiated from acute focal and exacerbated chronic pulpitis, acute apical and exacerbated chronic periodontitis, trigeminal neuralgia, sinusitis and alveolar pain.

Chronic forms of pulpitis...

For chronic forms of pulpitis, certain clinical signs are characteristic,

Common to all forms is a significant duration - from several weeks to several months and even years. A combination and inconsistency of the weak severity of subjective signs (for example, pain) and a significant degree of destruction of the hard tissues of the tooth is characteristic. In the presence of a cavity that is difficult to access for the action of stimuli, the pain symptom may be practically invisible.

Chronic fibrous pulpitis(rilpitis chronica fibrosa) The patient is worried about paroxysmal pain in the tooth from various stimuli: temperature, mechanical and chemical. From the anamnesis it turns out that the tooth previously hurt.

In some . cases of chronic fibrous pulpitis can proceed without communication between the carious cavity and the tooth cavity. Differential diagnosis. Chronic fibrous pulpitis must be differentiated from deep caries, chronic gangrenous pulpitis.

Chronic gangrenous pulpitis(rilpitis chronica gangraenosa). The patient complains of aching pains from various kinds of stimuli, mainly from hot ones, which do not stop after the action of these stimuli is eliminated. Sometimes pain can arise from a change in air temperature - when going outside or back. Sometimes bad breath worries. The patient indicates severe pain in the past, which then diminished or completely disappeared.

In the initial stages of gangrenous lesions, by probing, the pulp is painful and bleeding. With long-term gangrenous pulpitis, the coronal pulp can completely disintegrate, has a gray color, only part or all of the root pulp is preserved. In such cases, probing of the pulp is painless and only in the mouth of the canal is bleeding and soreness determined.

The electrical excitability of the tooth is significantly reduced (50-80 μA).

Differential diagnosis... Chronic gangrenous pulpitis must be differentiated from chronic fibrous pulpitis, chronic apical periodontitis.

Chronic hypertrophic pulpitis(rilpitis chronica hypertrophica). The patient complains of aching pain, which arises from various stimuli. The patient often complains of overgrowth of "wild meat" which bleeds easily. In some cases of coins there is only one bleeding in the complete absence of pain. Pain may only be observed when chewing violently.

On examination, a carious cavity is found, filled with overgrown tissue. The latter can be denser or of the granulation type, bleeding easily even with the slightest touch. Sometimes it causes minor pain.

Differentiated diagnostics... It is carried out with the growth of the gingival papilla or granulation tissue from periodontitis, bifurcation (trifucation) of the roots. The growth of the gingival papilla occurs as a result of trauma by its sharp edges of the carious cavity. I use to clarify the diagnosis? the probe with which the overgrown papilla 5 is pushed back along the outer edge of the carious cavity. If the periolont was the source of the proliferation of granulation tissue, then deep insertion of the probe is painless. There may be severe bleeding and perforation of the bottom of the coronal cavity of the tooth. On the roentgenogram, the rarefaction of bone tissue in the bifurcation area is determined.

Exacerbation of chronic pulpitis(rilpitis chronica exacerdata). For exacerbation of chronic pulpitis, paroxysmal pain in the tooth of a "spontaneous" nature is characteristic. There may be prolonged severe pain from external stimuli irradiating along the branches of the trigeminal nerve or aching prolonged pain, aggravated by biting on the tooth.

The electrical excitability of the pulp is reduced and corresponds to either chronic fibrous or chronic gangrenous pulpitis. On the roentgenogram, either the expansion of the periodontal gap or the rarefaction of bone tissue in the area of the apex of the tooth is determined.

Differential diagnosis. Exacerbation of chronic pulpitis is differentiated from acute forms of pulpitis, acute and exacerbated apical periodontitis. Acute and chronic exacerbated periodontitis is characterized by constant pain without light gaps, no complaints of pain from temperature and chemical stimuli.

Lecture number 7

Topic: Control of pain and fear. Anesthesia methods used in dental treatment. Methods for maintaining the viability of the pulp.

1.1 Technological map of lectures

Lesson time 80 min	Number of students
Activity type	**Introduce lecture news**
Lecture plan:	***First hour.*** 1 Pain and fear control. 2. Methods of anesthesia used in dental treatment. ***Second hour.*** 3. Methods for maintaining the viability of the pulp.
Objective of the lesson	Inform students, give a full explanation of the methods of pain relief used in dental treatment and methods of maintaining the viability of the pulp.
Teaching methods	Conversation, lecture visuals
Activity type	common-collective
Visual aids on the topic	Study guide, lecture material, projector, computer
The setting for the lesson	Methodical equipped classroom
Monitoring and evaluation criteria	Oral survey

1.1. Technological models for education

Stages of work	Teacher	Student
1.Preparation stages (10 minutes)	1.Objective of the lesson 2. Preparation of slides for the lecture material 3.Literature on the topic 1. Borovskiy E.V. "Therapeutic dentistry" M., 2006 2. Borovskiy E.V. va boshqalar "Therapeutic stomatology" .- M., 2004 3.Kamilov Kh.P., Mamedova F.M. "Davolash stomatologydan" recipe reference book. - 1995. 4. Borovskiy E.V., Barisheva Yu.D., Maksimovskiy Yu.M. "Therapeutic stomatology" .- M .: Medicine, 1998.	Listens and records
2.Introduction (15 minutes)	***1. Purpose and objectives of the lecture material:*** **<u>Target:</u>** Illuminate control of pain and fear. Illuminate methods of anesthesia used in dental treatment and methods of maintaining the	Listen Answers students' questions

	viability of the pulp. **Task:** Inform students, give a full explanation methods of anesthesia used in dental treatment and methods of preserving the viability of the pulp **Questions by topic** 1. The technique of opening the dental cavity of the incisors. 2. Pulp amputation technique. 3. The technique of opening the canine tooth cavity.	
3.main stage (45 minutes)	1. Introduction to the topic with slide show	Listen and record
4. Final stage (10 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listens and records

Lecture text

Endodontic dental treatment requires appropriate anesthetic support: all manipulations must be painless. Adequate pain relief creates psychophysiological comfort, significantly reduces emotional stress and contributes to better contact between the dentist and the patient, as well as to improve the quality and shorten the time of endodontic treatment.

The choice of the optimal methods of pain relief for endodontic intervention is not an easy task. The use of general anesthesia in endodontic practice has limited indications. Therefore, the leading, most effective, relatively safe and technically available method of anesthesia in endodontic practice is local anesthesia. It is indicated in all cases when endodontic interventions are accompanied by a painful reaction.

Almost all methods of local injection anesthesia can be used for endodontic treatment: infiltration, conduction, intraseptal, intraligamentary, as well as intrapulpal anesthesia.

Local injection anesthesia is often painful, especially when the needle is inserted and advanced through the tissues. This causes the patient to feel discomfort and fear of subsequent manipulations. In such cases, a three-stage anesthesia is recommended. At the first stage, a local anesthetic gel is applied for 1-1.5 minutes at the site of the future needle injection. The second stage is submucous (submucous) administration of 0.2-0.3 ml of anesthetic solution. The third stage - in 1-2 minutes - intraseptal or intraligamentary administration of anesthetic solution. If you need to anesthetize a

large area, each subsequent portion of the anesthetic is injected into the already deposited area. This technique, although it takes a little more time than the traditional one, is more preferable,

An additional and rather reliable method of pulp anesthesia is intrapulpal anesthesia. The disadvantage is that the needle is painful, so a good quality needle should always be used.

But even with the use of the most effective means and methods of local anesthesia, it is not always possible to achieve the maximum analgesic effect. This is especially often observed during anesthesia on the lateral teeth of the lower jaw. In addition, psychoemotional and autonomic regulation is impaired in some patients, and there are also peculiarities in the pain response. In such cases, local anesthesia must be combined with appropriate adjuncts used during premedication or drug preparation. Prescribe drugs with a pronounced analgesic effect (for example, ketorolac tromethamine, etc.) in combination with tranquilizers. They contribute to the potentiation of the effect of local anesthetics.

The use of local anesthetics in combination with other drugs is a combination of anesthesia, in which the selection of additional funds ensures the correction of the patient's functional state.

Preservation of pulp vitality is one of the most important tasks of therapeutic dentistry.

In order to fully or partially preserve the viability of the pulp, the following endodontic measures are carried out:

- an indirect protective coating of the pulp;
- direct protective coating of the pulp;
- vital amputation.

Indirect pulp capping

The concept of "indirect protective pulp coating" is interpreted in different ways.

This means either a two-stage gradual treatment of caries, or a targeted coating of the peri-pulpal dentin after complete removal of carious dentin from the cavity with deep caries.

A prerequisite for the success of the above measures is the presence of viable pulp and the absence of pulpitis symptoms (see section 5.5).

Direct pulp capping

Direct protective coating of the pool involves the application of drugs to the open surface of the pulp

The pulp can be exposed after preparation of a carious cavity or due to trauma. A positive prognosis is possible in the presence of a minor perforation (up to the size of a pinhead) with a healthy pulp and no inflammation. This condition is possible if the pulp was exposed in healthy dentin and there are no clinical symptoms of

pulpitis.A typical example of this is accidental exposure of the pulp during preparation or a complex fracture of the crown.

When opening the pulp as a result of trauma, direct coating should be carried out as soon as possible, up to a maximum of two days after trauma, as the pulp tissue may become infected.

If the pulp is opened during removal of carious dentin, the prognosis is highly uncertain. With a thinned layer of peri-pulpal dentin, inflammation is possible, and the likelihood of pulpitis also increases.

To cover the pulp, in most cases, calcium hydroxide is used, which creates a concentrated alkaline environment (pH> 12) and releases hydroxyl ions.

After applying calcium hydroxide to the wound surface at the site of contact, tissue necrosis is limited. In the underlying tissue layer, slight inflammation is observed and, due to an increase in the activity of tissue metabolism, multiple capillary neoplasms arise.

The necrotic zone towards the pulp causes the differentiation of fibroblasts and mesenchymal cells into cells that form a solid substance and collagen fibers. These fibers are mineralized into fibrodentin.

Already after seven days, "barriers" of the solid are observed. Within one to two months, secondary tubular dentin forms, bordering towards the pulp with fibrodentin

The most effective is the direct application of a protective coating to the pulp tissue, which prevents the formation of blood clots at the site of the dissection. It is important that the pulp cavity is tightly closed

Despite the fact that the layer of tertiary dentin is not always formed, the proportion of successful direct pulp capping, determined clinically, is quite high (70-95%).

Clinical Steps for Direct Pulp Capping

- complete drying of the tooth, use of a rubber dam,
- cleaning and drying of the carious cavity;
- application of soft calcium hydroxide without pressure;
- application of the second layer of hardening calcium hydroxide,
- application of the gasket;
- application of a protective pad.

Vital amputation

Vital amputation, or pulpotomy, refers to the partial removal of a viable pulp.

Indications for vital amputation: limited serous pulpitis, opening of a large surface of the pulp due to dental measures or crown fracture.

In permanent teeth, vital amputation is used for incomplete root growth of the affected tooth, when there is no possibility of root canal treatment.That is, vital amputation can be considered as a partial intervention until the end of root formation

The root pulp is removed with a sterile excavator and a rosette-like bur at the mouth of the root canal or a few millimeters deep into the root canal. Bleeding is stopped with physiological sodium chloride solution, further care of the amputation wound is carried out during direct coating.

The prognosis of the postoperative state with vital amputation is less favorable than with endodontic measures. Therefore, it is advisable to conduct clinical and X-ray control studies after 3, 6 and 12 months.

Process clinic:

- ensuring absolute dryness of the tooth when using a rubber dam,
- aseptic processing of the working field;
- removal of coronal pulp with sterile instruments;
- stopping bleeding with saline sodium chloride solution;
- then the same measures as in the direct coating of the pulp.

Lecture number 8

Topic: Methods for maintaining the viability of the pulp.

2.1 Technological map of lectures

Lesson time 80 min	**Number of students**
Activity type	**Introduce lecture news**
Lecture plan:	***First hour.*** 1 Diagnostics and treatment plan for various types of pulpitis ***Second hour.*** 2. General medical aspects affecting endodontic treatment
Objective of the lesson	Inform students, give a full explanation diagnosis and treatment plan for various types of pulpitis, general medical aspects affecting endodontic treatment, methods of whitening depulped and discolored teeth, treatment of pulpitis by a combination method.
Teaching methods	Conversation, lecture visuals
Activity type	common-collective
Visual aids on the topic	Study guide, lecture material, projector, computer
The setting for the lesson	Methodical equipped classroom
Monitoring and evaluation criteria	Oral survey

2.1. Technological models for education

Stages of work	Teacher	Student
1.Preparation stages (10 minutes)	1.Objective of the lesson 2. Preparation of slides for the lecture material 3.Literature on the topic 1. Borovskiy E.V. "Therapeutic dentistry" M., 2006 2. Borovskiy E.V. va boshqalar "Therapeutic stomatology" .- M., 2004 3.Kamilov Kh.P., Mamedova F.M. "Davolash stomatologydan" recipe reference book. - 1995. 4. Borovskiy E.V., Barisheva Yu.D., Maksimovskiy Yu.M. "Therapeutic stomatology" .- M .: Medicine, 1998.	Listens and records
2.Introduction (15 minutes)	***1. Purpose and objectives of the lecture material:*** **Target:** Illuminate diagnosis and treatment plan for various types of pulpitis, general medical aspects affecting endodontic treatment. **Task:** Inform students, give a complete diagnosis and treatment plan for various types of pulpitis, general medical aspects affecting endodontic treatment. **Questions by topic** 1. Technique for evacuating decay from canals 2. Technique for extirpation of the pulp. 3. Technique for instrumental processing of canals.	Listen Answers students' questions
3.main stage (45 minutes)	1. Introduction to the topic with slide show	Listen and record
4. Final stage (10 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listens and records

Lecture text

Preservation of pulp vitality is one of the most important tasks of therapeutic dentistry.

In order to fully or partially preserve the viability of the pulp, the following endodontic measures are carried out:

- an indirect protective coating of the pulp;
- direct protective coating of the pulp;
- vital amputation.

Indirect pulp capping

The concept of "indirect protective pulp coating" is interpreted in different ways.

This means either a two-stage gradual treatment of caries, or a targeted coating of the peri-pulpal dentin after complete removal of carious dentin from the cavity with deep caries.

A prerequisite for the success of the above measures is the presence of viable pulp and the absence of pulpitis symptoms (see section 5.5).

Direct pulp capping

Direct protective coating of the pool involves the application of drugs to the open surface of the pulp

The pulp can be exposed after preparation of a carious cavity or due to trauma. A positive prognosis is possible in the presence of a minor perforation (up to the size of a pinhead) with a healthy pulp and no inflammation. This condition is possible if the pulp was exposed in healthy dentin and there are no clinical symptoms of pulpitis.A typical example of this is accidental exposure of the pulp during preparation or a complex fracture of the crown.

When opening the pulp as a result of trauma, direct coating should be carried out as soon as possible, up to a maximum of two days after trauma, as the pulp tissue may become infected.

If the pulp is opened during removal of carious dentin, the prognosis is highly uncertain. With a thinned layer of peri-pulpal dentin, inflammation is possible, and the likelihood of pulpitis also increases.

To cover the pulp, in most cases, calcium hydroxide is used, which creates a concentrated alkaline environment (pH> 12) and releases hydroxyl ions.

After applying calcium hydroxide to the wound surface at the site of contact, tissue necrosis is limited. In the underlying tissue layer, slight inflammation is observed and, due to an increase in the activity of tissue metabolism, multiple capillary neoplasms arise.

The necrotic zone towards the pulp causes the differentiation of fibroblasts and mesenchymal cells into cells that form a solid substance and collagen fibers. These fibers are mineralized into fibrodentin.

Already after seven days, "barriers" of the solid are observed. Within one to two months, secondary tubular dentin forms, bordering towards the pulp with fibrodentin

The most effective is the direct application of a protective coating to the pulp tissue, which prevents the formation of blood clots at the site of the dissection. It is important that the pulp cavity is tightly closed

Despite the fact that the layer of tertiary dentin is not always formed, the proportion of successful direct pulp capping, determined clinically, is quite high (70-95%).

Clinical Steps for Direct Pulp Capping

- complete drying of the tooth, use of a rubber dam,
- cleaning and drying of the carious cavity;
- application of soft calcium hydroxide without pressure;
- application of the second layer of hardening calcium hydroxide,
- application of the gasket;
- application of a protective pad.

Vital amputation

Vital amputation, or pulpotomy, refers to the partial removal of a viable pulp.

Indications for vital amputation: limited serous pulpitis, opening of a large surface of the pulp due to dental measures or crown fracture.

In permanent teeth, vital amputation is used for incomplete root growth of the affected tooth, when there is no possibility of root canal treatment.That is, vital amputation can be considered as a partial intervention until the end of root formation

The root pulp is removed with a sterile excavator and a rosette-like bur at the mouth of the root canal or a few millimeters deep into the root canal. Bleeding is stopped with physiological sodium chloride solution, further care of the amputation wound is carried out during direct coating.

The prognosis of the postoperative state with vital amputation is less favorable than with endodontic measures. Therefore, it is advisable to conduct clinical and X-ray control studies after 3, 6 and 12 months.

Process clinic:

- ensuring absolute dryness of the tooth when using a rubber dam,
- aseptic processing of the working field;
- removal of coronal pulp with sterile instruments;
- stopping bleeding with saline sodium chloride solution;
- then the same measures as in the direct coating of the pulp.

Lecture number 9

Topic: Plan for the diagnosis and treatment of various forms of pulpitis. Sealing the root canal system.

2.1 Technological map of lectures

Lesson time 80 min	**Number of students**
Activity type	**Introduce lecture news**
Lecture plan:	***First hour.*** 1 Diagnostics and treatment plan for various types of pulpitis ***Second hour.*** 2. General medical aspects affecting endodontic treatment
Objective of the lesson	Inform students, give a full explanation diagnosis and treatment plan for various types of pulpitis, general medical aspects affecting endodontic treatment, methods of whitening depulped and discolored teeth, treatment of pulpitis by a combination method.
Teaching methods	Conversation, lecture visuals
Activity type	common-collective
Visual aids on the topic	Study guide, lecture material, projector, computer
The setting for the lesson	Methodical equipped classroom
Monitoring and evaluation criteria	Oral survey

2.1. Technological models for education

Stages of work	**Teacher**	**Student**
1.Preparation stages (10 minutes)	1.Objective of the lesson 2. Preparation of slides for the lecture material 3.Literature on the topic 1. Borovskiy E.V. "Therapeutic dentistry" M., 2006 2. Borovskiy E.V. va boshqalar "Therapeutic stomatology" .- M., 2004 3.Kamilov Kh.P., Mamedova F.M.	Listens and records

	"Davolash stomatologydan" recipe reference book. - 1995. 4. Borovskiy E.V., Barisheva Yu.D., Maksimovskiy Yu.M. "Therapeutic stomatology" .- M .: Medicine, 1998.	
2.Introduction (15 minutes)	***1. Purpose and objectives of the lecture material:*** **Target:** Illuminate diagnosis and treatment plan for various types of pulpitis, general medical aspects affecting endodontic treatment. **Task:** Inform students, give a complete diagnosis and treatment plan for various types of pulpitis, general medical aspects affecting endodontic treatment. **Questions by topic** 1. Technique for evacuating decay from canals 2. Technique for extirpation of the pulp. 3. Technique for instrumental processing of canals.	Listen Answers students' questions
3.main stage (45 minutes)	1. Introduction to the topic with slide show	Listen and record
4. Final stage (10 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listens and records

Lecture text

Diagnosis of pulpitis is carried out by taking anamnesis, clinical examination, additional examination methods and is aimed at determining the state of the pulp and periapical tissues and indications for treatment, as well as identifying in the history of factors that prevent the immediate initiation of treatment. Such factors may be: - The presence of intolerance to drugs and materials used at this stage of treatment - Inadequate psycho-emotional state of the patient before treatment - Acute lesions of the oral mucosa and the red border of the lips - Acute inflammatory diseases of organs and tissues of the mouth 6 - Life-threatening acute condition / disease or exacerbation of a chronic disease (including myocardial infarction, acute cerebrovascular accident, etc.), developed less than 6 months before the date of applying for this dental care - Refusal of treatment. From clinical data, pain reaction is the most important criterion for assessing the state of the pulp, although there is no

direct relationship between the histological picture and clinical manifestations. Toothache can serve as an indicator of the irreversibility of changes in the pulp. X-ray examination helps to differentiate with other diseases with similar symptoms.

The principles of treatment of patients with pulpitis provide for the simultaneous solution of several problems: - prevention of further development of the pathological process; - preservation and restoration of the anatomical shape of the affected tooth and the functional ability of the entire dentoalveolar system; - prevention of the development of pathological processes and complications in the periapical tissues; - improving the quality of life of patients. Pulpitis treatment includes: - activities, aimed at preserving the viability of the pulp (if possible) - conducting local anesthesia (in the absence of general contraindications) - creating access to the tooth cavity - opening the tooth cavity - creating a rectilinear access to the root canals - removing the pulp - passing the root canal - determining the working length of the root canal - root canal treatment (mechanical and medication) - root canal filling - control using radiation imaging methods - application of physical methods (as required) - restoration of teeth after endodontic treatment. The working length of the canal is the length of the canal to the apical constriction. With the preserved coronal part, it is determined (with obligatory X-ray control) in 7 anterior teeth from the incisal edge, in the chewing teeth from the tubercle, with a destroyed coronal part from the mouth of the canal. The working length of the canal is necessary to control the penetration depth of instruments during processing and when filling the canal. In case of unsuccessful conservative treatment or its impossibility, the issue of tooth extraction is considered. The choice of treatment tactics is influenced by the following factors: the anatomical structure of the tooth (significantly curved or atypical inσ the structure of the roots is a significant problem) pathological conditions (pronounced obliteration of root canals,σ internal or external resorption of root canals, horizontal and vertical root fractures) the consequences of a previous intervention on this toothσ isolation, access and the ability to perform treatment (the ability toσto qualitatively isolate the working field, the degree of opening of the patient's mouth, concomitant pathology); functional value of the tooth;σ the possibility of subsequent restoration of the anatomical shapeσ the coronal part of the tooth is the state of the periodontium.σTreatment of pulpitis is currently mandatory (in the absence of contraindications) to be carried out under local anesthesia without the use of devitalizing drugs. The choice of a method for treating pulpitis depends on the clinical picture, manifestations and symptoms, diagnosis and can be different - from dynamic observation to tooth extraction. With initial and acute pulpitis and / or accidental opening of the tooth cavity, it is possible to use methods of preserving the pulp (complete or partial).

The aim of filling is to achieve obturation of the canal to the apical foramen or physiological narrowing of the root and to prevent re-infection of the canal by microorganisms. It is possible to fill the root canal if there are no pain symptoms, exudate, sensitivity to percussion. You must first isolate the tooth from saliva. The material for filling root canals should have the following properties: 1. easy to

manipulate for a sufficiently long working time; 2. have spatial stability, do not shrink and do not change shape after insertion into the canal; 3. fill the canal, repeating its contours; 4. do not irritate the periapical tissues; 5. be moisture resistant, non-porous; 6. be radiopaque, easy to identify in the images; 7. do not change the color of the tooth; eight. if necessary, it is easy to remove from the root canal. Quality criteria for root canal obturation: Uniform material density throughoutσ Tightness of obturationσ Maintaining the intact periodontalσObturation of the canal to physiological narrowing or apical foramen. To achieve these results, the methods of root canal filling are used using gutta-percha in the technique of lateral and vertical condensation, thermophiles, as well as pastes with a filling method with one (central) pin. Filling of root canals using only paste without gutta-percha pins is not recommended. It is possible to perform 22 root canal obturations without the use of pins in the case of using materials that are not intended for the above methods. See Appendix No. 3. After the obturation of the canal, it is necessary to carry out an X-ray control of the filling.

Lecture number 10

Theme: Emergency care in endodontics: diagnosis of odontogenic pain. Treatment tactics for patients with pain syndrome

4.1 Flow chart of lectures

Lesson time 80 min	**Number of students**
Activity type	**Introduce lecture news**
Lecture plan:	***First hour.*** 1The anatomical structure of the pulp. The histological structure of the pulp. Pulp physiology. Pulp functions. 2. Changes in the pulp in various diseases. ***Second hour.*** 3.Pulpitis. Etiology, pathogenesis and classification of pulpitis. 4.Changes in the pulp in diseases of the dentition and general diseases of the body
Objective of the lesson	Inform students, give a full explanation the structure and functions of the pulp for variousdental pain, etiology, pathogenesis and classification of pulpitis
Teaching methods	Conversation, lecture visuals
Activity type	common-collective
Visual aids on the topic	Study guide, lecture material, projector, computer
The setting for the	Methodical equipped classroom

lesson	
Monitoring and evaluation criteria	Oral survey

4.2. Technological models for education

Stages of work	Teacher	Student
1.Preparation stages (10 minutes)	1.Objective of the lesson 2. Preparation of slides for the lecture material 3.Literature on the topic 1. Borovskiy E.V. "Therapeutic dentistry" M., 2006 2. Borovskiy E.V. va boshqalar "Therapeutic stomatology" .- M., 2004 3.Kamilov Kh.P., Mamedova F.M. "Davolash stomatologydan" recipe reference book. - 1995. 4. Borovskiy E.V., Barisheva Yu.D., Maksimovskiy Yu.M. "Therapeutic stomatology" .- M .: Medicine, 1998.	Listens and records
2.Introduction (15 minutes)	***1. Purpose and objectives of the lecture material:*** **Target:** To illuminate the structure and functions of the pulp at various timesdental pain, etiology, pathogenesis and classification of pulpitis **Task:** Inform students, give a full explanation the structure and functions of the pulp for variousdental pain, etiology, pathogenesis and classification of pulpitis **Questions by topic** 1. The anatomical structure of the pulp. 2. Physiology of the pulp. Pulp functions 3. Etiology of pulpitis. 4.Classification of pulpitis	Listen Answers students' questions
3.main stage (45 minutes)	1. Introduction to the topic with slide show	Listen and record
4. Final stage (10 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listens and records

Lecture text

The painful reaction, being a signal of danger, in the process of evolution has acquired the importance of a powerful means of self-preservation of the organism from the destructive influences of the environment. However, the physiological significance of pain persists only as long as it performs a signaling function and ensures the mobilization of the body's defenses. Severe and prolonged pain turns into a damaging factor, can have a negative effect on many functions of the body, become an endogenous pathogenetic mechanism for the development of new pathological processes and pose a danger to the body, disrupting the regulation of homeostasis, the activity of the autonomic nervous system, depressing the psyche, causing stress, depression, being cause of immune deficiency. There are different classifications of pain depending on the location (somatic superficial and deep; visceral, neuropathic and central pain); causes of damage: (inflammation, trauma, ischemia, tissue strain, cancer); time parameters (acute and chronic).

Painful sensation is integrated at various levels of the central nervous system with the involvement of the structures of the nociceptive system of the spinal cord, subcortical formations and cerebral cortex involved in the perception, transmission and processing of information due to the effect of a damaging factor on the body [9, 10, 15, 16].

Nociceptors, non-encapsulated endings of afferent nerve fibers located in all tissues and internal organs, perceive the effect of a damaging agent. Nociceptors make up 25-40% of all receptor formations. The intensity of pain during dental interventions is due to the high content of nociceptors in the dental tissues. So, if there are about 200 receptors per 1 cm2 of the skin, then in dentin there are 15,000-30,000, and on the border of enamel and dentin there are 75,000 receptors.

Nociceptors can be activated both by exogenous (mechanical, chemical, thermal) stimuli, and by the action of endogenous algogens

(prostaglandins, bradykinin, kallidin, histamine, substance P, neurokinin A, K + and H + ions, amino acids - glutamate, aspartate, etc.). The impulse is transmitted along the nerve fibers of types A and C. Rapidly arising primary pain spreads along the fibers of type A, burning, which occurs after a latent period, along the fibers of group C. Localized pain irritation enters the central nervous system through fibers of type A, and diffuse - along fibers of type C. The impulse caused by irritation of the nociceptor, along the C and A-delta fibers enters the posterior horns of the spinal cord or their cranial analogs, from where it is conducted through the ascending afferent tracts to the reticular formation of the midbrain, hypothalamus, thalamus, limbic system and cerebral cortex ... Toothache from the nociceptor along the C and A-delta fibers enters the gasser ganglion, then into the caudal nucleus of the trigeminal nerve,

Damaging effects, causing pain, not only trigger the transmission mechanisms of pain impulses, but also activate the supraspinal antinociceptive system, which unites structures localized in the trunk, medulla oblongata, middle and spinal cord. This system monitors the transmission of nociceptive signals at various levels of the

central nervous system. The existence of the antinociceptive system, which provides pain suppression, helps the body adapt to the changing conditions of the external and internal environment. Downward inhibition is carried out by serotonergic, adrenergic and peptidergic or opioid (enkephalinergic, etc.) systems of the brain.

Pain perception is coordinated by the interaction of the nociceptive and antinociceptive systems, which determines its emotional assessment, autonomic and hormonal responses to pain. A decrease in the activity of the antinociceptive system leads to the development of hyperalgesia, and arousal leads to hypoalgesia. The highest integrative center that perceives nociceptive information is the cerebral cortex. Intense and prolonged pain can significantly affect respiration, cardiovascular, neuroendocrine systems and metabolism, provoke emergency conditions [3, 4, 9, 10, 16].

Pain of varying intensity is a constant companion of most pathological processes and interventions in the oral cavity, which is determined by the rich mixed (somatic and vegetative) innervation of this area, and the doctor's task is to prevent its occurrence [1, 2, 5, 6, 7, 8, 11, 12 , 13, 14].

Pain can occur spontaneously (spontaneously, for no reason, without external influence) or spontaneously (as a result of an obvious stimulus).

The irritants that cause pain are most often the following: - mechanical (pressing on the tooth, getting food into the carious cavity, closing the teeth, touching the trigger zones, etc.); - thermal (cold, heat, preparation of teeth without cooling, etc.); - chemical (sweet, sour, salty, the influence of certain medications or filling materials).

Determining the nature of the stimulus that leads to the appearance of pain, when questioning or objectively examining the patient, is very important for timely and correct diagnosis.

The presence of pain is the most common complaint with which patients go to the dentist.

To determine the picture of the pain symptom, specify: the cause (etiology), nature, localization, duration, strength and irradiation.

Toothache may be classified as follows: By etiology: - spontaneous (causeless, spontaneous) - spontaneous (causal).

By localization: -localized (local) -unlocalized (extensive) -surface -deep -irradiating.

By duration: - short-term - long - permanent - periodic - seizure-like.

By nature: - dull - sharp - stabbing - whining - pulsating, etc.

By strength: -strong -weak.

Each of these characterological varieties of a pain symptom or its combination is characteristic of a specific pathological process and facilitates its diagnosis.

Pain can be the first or only manifestation of the disease, so its identification facilitates the diagnosis of the problems that have arisen and the treatment of the patient.

In cases where pain is one of the symptoms of a disease, for example, herpetic gingivostomatitis, it only complements the picture of the pathological process and is, first of all, a therapeutic rather than a diagnostic problem.

On the contrary, pain is sometimes the main manifestation of the disease with insufficient results of an objective examination (pulpitis as a result of latent caries in a visually intact tooth, neuralgia, stomatodynia, glossodynia, etc.). One of the main differential diagnostic features of a pain symptom is the ability to determine its clear localization. If the patient is able to accurately localize pain sensations, then this, in most cases, indicates the presence of a cause that is easy to establish. The cause of pain in the oral cavity can be inflammation of the oral cavity or its traumatic injury, which the patient does not even know about. Inflammation of the interdental papillae is common in children due to the proximal-occlusal characteristic localization of the carious cavity. The painful sensation can be localized in one tooth or a group of teeth.
It is much more difficult to establish the cause of pain, which the patient cannot accurately localize. In some cases, the pain gradually or immediately acquires an indefinite diffuse character, and the patient is not able to determine which tooth hurts and often cannot even indicate which jaw: upper or lower.
Indistinct localization of pain accompanies the eruption of permanent teeth in children. Sometimes patients complain of pain in any area of the face: in the area of the teeth, eyes, ear, jaw. In such situations, it is important to establish a zone of increased pain or its constant irradiation. Acute pulpitis pain, for example, in most cases does not have a clear localization and patients indicate that the pain radiates to the ear and eye or only to the ear.
Short-term pains are more common with causative pains and occur immediately after the action of a specific causative factor.
Acute serous pulpitis - the pain is localized in the causative tooth, acute (the intensity of pain increases during the transition of partial inflammation to diffuse), intensifies from cold, spontaneous, paroxysmal (pain attacks are shorter than the painless interval), repeated repeatedly during the day (especially in the evening or at night). It can radiate along the branches of the trigeminal nerve.
Acute purulent pulpitis - the pain is non-localized, spontaneous, almost continuous, increases from hot and when biting, decreases from cold, significantly increases at night, bursting, pulsating, radiating along the branches of the trigeminal nerve.
Chronic fibrous pulpitis in the acute stage (chronic pulpitis, ICD-S, 1997) - the pain is localized in the causative tooth, arises from the action of the stimulus (change in ambient temperature, sucking movements from the tooth, etc.), slowly passes after the removal of the action of the stimulus, aching.
Chronic gangrenous pulpitis in the exacerbation stage (pulp gangrene, pulp necrosis, ICD-S, 1997) - the pain is localized in the causative tooth, pronounced, arises from the action of strong stimuli (especially hot), sometimes when biting, calms down from the cold, slowly grows and slowly passes, bursting.
Chronic hypertrophic pulpitis in the acute stage (hyperplastic pulp polyp, ICD-S, 1997) - the pain is localized in the causative tooth, weak, arises from the action of mechanical stimuli (food intake).

Lecture number 11

Theme: General medical aspects affecting endodontic treatment. Tooth restoration after endodontic intervention.

1.1 Technological map of lectures

Lesson time 80 min	**Number of students**
Activity type	**Introduce lecture news**
Lecture plan:	***First hour.*** 1Periodontium. Structure, functions. Age-related changes. 2.. Etiology, pathogenesis and diagnosis of periodontitis. ***Second hour.*** 3. Clinic of acute and chronic periodontitis 4. Diagnostics and differential diagnostics.
Objective of the lesson	Inform students, give a full explanation of the periodontium, structure, function, age-related changes, etiology, pathogenesis and diagnosis of periodontitis, the line of acute and chronic periodontitis, diagnosis and differential diagnosis.
Teaching methods	Conversation, lecture visuals
Activity type	common-collective
Visual aids on the topic	Study guide, lecture material, projector, computer
The setting for the lesson	Methodical equipped classroom
Monitoring and evaluation criteria	Oral survey

1.1. Technological models for education

Stages of work	**Teacher**	**Student**
1.Preparation stages (10 minutes)	1.Objective of the lesson 2. Preparation of slides for the lecture material 3.Literature on the topic 1. Borovskiy E.V. "Therapeutic dentistry" M., 2006 2. Borovskiy E.V. va boshqalar "Therapeutic stomatology" .- M., 2004 3.Kamilov Kh.P., Mamedova F.M.	Listens and records

	"Davolash stomatologydan" recipe reference book. - 1995. 4. Borovskiy E.V., Barisheva Yu.D., Maksimovskiy Yu.M. "Therapeutic stomatology" .- M .: Medicine, 1998.	
2.Introduction (15 minutes)	***1. Purpose and objectives of the lecture material:*** **Target:** Illuminate periodontium, structure, functions, age-related changes, etiology, pathogenesis and diagnosis of periodontitis, line of acute and chronic periodontitis, diagnosis and differential diagnosis **Task:** Inform students, give a full explanation periodontium, structure, functions, age-related changes, etiology, pathogenesis and diagnosis of periodontitis, line of acute and chronic periodontitis, diagnosis and differential diagnosis **Questions by topic** 1. Cellular composition of the periodontium 2. Innervation of the periodontium 3. Causes of inflammation in the periodontium 4.Classification of periodontitis	Listen Answers students' questions
3.main stage (45 minutes)	1. Introduction to the topic with slide show	Listen and record
4. Final stage (10 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listens and records

Lecture text

The final stage in achieving the effectiveness of endodontic treatment is the restoration of tooth function by including it in harmonious occlusal contacts.
Endodontic treatment is accompanied by deep destruction of the tooth structure. The loss of hard tissues of the crown of the tooth occurs as a result of the carious process and preparation. The mechanical resistance of the endodontically treated tooth to the chewing load is weakened, since the arch of the tooth cavity is removed, as a result of which an important cross-link is lost. The strength of the preserved tooth structures

directly depends on the volume of the remaining dentin, and the resistance to fractures increases with increasing tooth thickness.

It is well known that pulped teeth require a special approach in their restoration compared to living ones. First, they are more fragile due to a decrease in the content of internal water in enamel and dentin. Secondly, as a result of preparation, there is a significant loss of hard tissue, and first of all, loss of crown dentin and, to a lesser extent, root dentin. Third, the pulped teeth are often discolored.

As a rule, after endodontic treatment, there are several clinical situations: 1. The access cavity is located in the center of the chewing surface of the posterior teeth or the lingual (palatal) surface of the anterior teeth with completely preserved tooth walls. 2. The proximal walls of the posterior teeth are completely destroyed, and the lingual (palatal) and buccal surfaces of the crown are preserved, but significantly thinned. 3. The coronal part of the tooth is completely destroyed, and the root is stable and protrudes above the level of the gums. 4. The crown of the tooth is completely destroyed, and the root is partially destroyed. There are many clinical techniques for restoring endodontically treated teeth. In some respects they are similar, but each technique has certain advantages and specific applications. Modern techniques can be combined.

In each case, the dentist must individually and locally solve the main problem of restoration: the optimal ratio of restoration retention and dental tissue resistance.

The main clinical criteria for choosing the method and type of tooth restoration after endodontic treatment are: • the depth and shape of destruction of the crown part of the tooth; • condition of the remaining hard tissues of the root part of the tooth; • condition of the ligamentous apparatus of the tooth (periodontium); • condition of peri-apical tissues; , • time elapsed after depulpation; , • dentin color. Wait a few days before carrying out a complete restoration of an endodontically treated tooth. This will allow timely identification of complications after treatment and take the necessary measures.

The most rational approach to the final restoration has recently become a course of tooth whitening.

When restoring an endodontically treated tooth, it is necessary to distinguish the following types of restoration structures: filling, pin, stump, crown.

RECOVERY TOOTH WITH AID
SEALING MATERIAL

In a situation where a tooth has an intact crown with preserved crown dentin, a filling may become the only and simplest method of restoring an endodontically treated tooth. About half of the pulped teeth can be restored with fillings without resorting to other restoration methods.

The minimum condition for restoration of a tooth with a filling is the preservation of two enamel-dentin walls - buccal and lingual - taking into account their state after preparation.

The crown of the tooth is restored with composite materials or the "sandwich" technique is used. To obtain a cosmetic effect, the entire color range of the restoration material is used.

The inner layer of the dentin of the depulped tooth is restored with a composite material of opaque (opaque) shades. The peri-pulpal dentin should be lighter than the mantle. The base of the composite restoration is reinforced with fiberglass or carbon fiber ceramics for increased strength.

Amalgam fillings and metal inlays are not suitable for permanent filling of endodontically treated molars, since in the cavity of a tooth weakened by expansion, they act like a wedge and lead to the formation of vertical fractures within a few months after filling.

RESTORATION OF THE TOOTH WITH THE ASSISTANCE ROOT PIN

In case of excessive weakening of the tooth crown, a root post construction (Post-system) should be used to restore it. The main function of the root post is to provide sufficient retention of the restoration in the root of the remaining tooth. An absolute indication for a post construction is a loss of 50% or more of the coronal tissue of the tooth. If the decay is less pronounced, the tooth can be restored with a filling material.

Root posts are made from various materials: metal, ceramic, polymer. Metal pins are made from gold-platinum-palladium alloys, titanium and its alloys, stainless steel and brass.

Recently, metal-free fiberglass and carbon fiber adhesive root posts have entered the dental market. They have an elasticity close to that of dentin. Thanks to the metal-free adhesive pins, a single monolithic structure is created that can withstand both vertical and lateral loads without destroying the root system. They do not stain dentin and restorative material. These pins are similar in color to natural teeth.

In some cases, it is impossible to carry out a guaranteed restoration of a pulped tooth without a root post. The quality of the restoration performed is largely determined by the correct choice, placement and fixation of the root post. Therefore, the doctor, giving preference to one type of root post or another, should know the capabilities, advantages and disadvantages of each type. It is important to choose a post design that provides maximum retention while preserving the remaining tooth structure as much as possible. When choosing the type of root post, the condition of the root, the group belonging of the tooth and the effect of occlusal loads on it are taken into account. Factors that also affect the choice of the root post and the preparation of the tooth are the degree of tooth decay, the size of the root of the tooth and the anatomical features of its structure; root condition after endodontic treatment; the degree of thinning of the walls of the root canal.

The root post must be of such a diameter that, after preparing the landing bed for it, the root wall thickness is more than 1 mm on each side of the post. If the thickness of the root canal walls is less than 1 mm, the fixation of the nail in such canal when the occlusal forces act on the tooth may further lead to a root fracture. When choosing a root post, it is important to take into account not only the root width, but also its length. Regardless of the type of root post selected, its length must be selected so that the landing bed occupies at least half of the canal length.

In the process of endodontic treatment, it is often necessary to prepare the root canal for the post, which serves as a support for the formation of the tooth stump. The preparation of the root for the pins has its own characteristics. The first thing to remember is that the direction of the root post must match the direction of the tooth. Otherwise, the prerequisites for splitting the root are created. A 1: 2 ratio between the subgingival and supragingival part of the nail must be strictly observed. The thickness of the root post is selected taking into account the size of the root, since with a significant expansion of the canal, the strength of the root can be weakened, and it will not withstand the load after the construction is made. The preparation of the channel for the support pin is carried out in the process of its expansion, and during filling, only the apex is filled.

To prepare the canal for the posts, a set of reamers included in the set of root posts is used.

The stage is completed by fitting the root post in the canal and a control X-ray. The canal is then cleaned and the post is fixed in it using composite cement or other adhesive material.

After fixation of the root post, the crown part of the tooth is completely restored with any composite or a stump is formed for other restoration structures.

Recently (O. Khidirbegishvili, 2001) proposed a new type of root structure - pin-filler. The post-filler bed is prepared directly during the preparation of the root canal. The post filler is made of fiberglass and should be in the shape of the last instrument used for preparation, i.e. final file. The post filler can adhesively bond with the root dentin and the composite in the crown of the tooth, thereby not only improving the retention of the restoration material, but also strengthening the remaining tooth tissue. A harmonious complex of materials is formed (dentin, composite cement, fiberglass and composite) with compatible biomechanical characteristics.

Lecture number 12

Topic: Dentist tactics when working with poorly passable canals. Errors and complications in endodontics

1.1 Technological map of lectures

Lesson time 80 min	**Number of students**
Activity type	**Introduce lecture news**
Lecture plan:	***First hour.*** 1 Antiseptics in the treatment of periodontitis 2. Filling materials in the treatment of periodontitis ***Second hour.***

	3. Conservative methods of treatment of periodontitis.... 4. Tactics of the dentist in the treatment of periodontitis.
Objective of the lesson	Inform students, give a full explanation antiseptics and filling materials used in the treatment of periodontitis, conservative methods of treatment of periodontitis, the tactics of the dentist in the treatment of periodontitis.
Teaching methods	Conversation, lecture visuals
Activity type	common-collective
Visual aids on the topic	Study guide, lecture material, projector, computer
The setting for the lesson	Methodical equipped classroom
Monitoring and evaluation criteria	Oral survey

1.1. Technological models for education

Stages of work	Teacher	Student
1.Preparation stages (10 minutes)	1.Objective of the lesson 2. Preparation of slides for the lecture material 3.Literature on the topic 1. Borovskiy E.V. "Therapeutic dentistry" M., 2006 2. Borovskiy E.V. va boshqalar "Therapeutic stomatology" .- M., 2004 3.Kamilov Kh.P., Mamedova F.M. "Davolash stomatologydan" recipe reference book. - 1995. 4. Borovskiy E.V., Barisheva Yu.D., Maksimovskiy Yu.M. "Therapeutic stomatology" .- M .: Medicine, 1998.	Listens and records
2.Introduction (15 minutes)	***1. Purpose and objectives of the lecture material:*** **Target:** Illuminate antiseptics and filling materials used in the treatment of periodontitis, conservative methods of treatment of periodontitis, dentist tactics in the treatment of periodontitis **Task:**	Listen Answers students' questions

	Inform students, give a full explanation antiseptics and filling materials used in the treatment of periodontitis, conservative methods of treatment of periodontitis, dentist tactics in the treatment of periodontitis **Questions by topic** 1. How are root canal filling materials classified? 2.Conservative methods of treatment of periodontitis 3.Dentist tactics in the treatment of periodontitis	
3.main stage (45 minutes)	1. Introduction to the topic with slide show	Listen and record
4. Final stage (10 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listens and records

Lecture text

During and after endodontic treatment, various errors and complications may develop. They can be conditionally divided into two groups.

Errors and complications associated with the creation of endodontic access: • insufficient removal of the fornix of the tooth cavity; • perforation of the tooth crown at the neck level; • i perforation of the walls of the crown cavity; •; perforation of the bottom of the crown cavity; • perforation in the area of bifurcation; • breaking off the vestibular or lingual wall of the tooth; • staining of the crown of non-vital teeth. Errors and complications associated with chemomechanical preparation and root canal obturation: absence of the root canal mouth; skipping probable root canals; the formation of a ledge in the wall of the root canal; perforation of the root canal wall; breaking off the instrument in the root canal; longitudinal root fracture; formation of the channel in the form of an "hourglass"; formation of the lower curvature of the channel in the form of "saw teeth";

Conservative endodontics... 7 • pushing the decay products of the pulp through the top of the cervical opening into the periapical tissue; • foreign material in the periapical tissues; • blockade of the root canal; • apical perforation; • reaction to endodontic medications (materials); • damage to the growth zone of an unformed root of a permanent tooth; • trauma to the rudiment of a permanent tooth during the treatment of temporary teeth; • perforation of the walls of the maxillary sinus; • trauma to the neurovascular bundle in the canal of the lower jaw; • postendodontic 'compression neuropathy of the branches of the trigeminal nerve; • poor quality root canal filling: - incomplete filling of the root canal; - removal of the filling material for the apical opening; aspiration or swallowing of rod instruments; air embolism ^

Formation of subcutaneous emphysema of the face and neck; post-endodontic pain; root canal reinfection; persistent peri-root infections.

Let's consider some of the most severe and common complications in endodontic treatment and ways to eliminate them.

TOOTH PERFORATION

Perforation is defined as an artificial hole in the <tooth or its root, as a result of which the cavity of the tooth communicates with the periodontal tissues. There are the following tooth perforations: lateral (through the walls of the crown cavity); furcation (through its bottom); walls of the root canal and apical foramen.

Perforations result from poor orientation, viewing and rough preparation - without regard to the position of the tooth and its working length.

Perforation should be considered a significant limiting factor in endodontic treatment.

Perforation of the walls and bottom of the crown cavity is most often observed with poor knowledge of the topographic features of its structure and excessive expansion of the orifices of the root canals, sometimes as a result of an attempt to detect the mouth of the sclerosed canal.

The diagnosis of perforation of the bottom and walls of the crown cavity is not very difficult.

The perforation of the bottom of the crown cavity is easy to detect by probing. Indication of root canal orifices using dyes helps to avoid perforation of the bottom of the crown cavity of a multi-rooted tooth. Of course, it is important, as already mentioned, to know the topography of the root canals and their orifices.

Perforation of the bottom and walls of the crown cavity requires urgent measures. Perforation should be repaired immediately after it occurs, as delay can lead to the development of an inflammatory process at the site of perforation, which is difficult to treat and jeopardizes the possibility of tooth preservation.

Treatment of lateral perforations of the crown cavity is reduced to exposing the neck of the tooth by surgery and filling, similar to the treatment of class V cavities.

Furcation perforations are removed through the crown cavity using materials for retrograde canal filling (amalgam, glass ionomer cements, compomers, calcium phosphate cements, osteoplastic materials). The classic perforation filling for the bottom of the crown cavity is gold foil, on top of which the amalgam is laid.

The success of treatment will depend on the ability to fill the perforation without significant excess filling.

Conservative endodontics of periodontal material and prevention of infectious inflammation in it.

Narrow perforations are bbutured according to the principles of root canal filling. With wide perforation, preparations based on calcium hydroxide are preliminarily applied to the wound.

Perforation of the root canal wall can be the result of inaccurate use of endodontic instruments when their axis does not correspond to the direction of the root canal. In addition, perforation of the canal wall can occur when trying to prepare curved root canals. Depending on their location, root canal perforations are divided into apical, middle and coronal.

Perforation of the root canal wall is evidenced by acute pain that suddenly appeared during manipulation in the tooth cavity, as well as the appearance of blood in the lumen of the root canal. In this case, an X-ray examination is required with a root needle inserted into the canal. Most often, the root of the tooth is perforated in the places of its curvature. The resorbed root wall is particularly easily perforated.

To prevent perforation of the root canal wall, forced passage of narrow and obliterated root canals and irrational use of machine instruments should be avoided. In addition, it is advisable to periodically resort to X-ray control during the passage of the root canal. It may be useful to study the roentgenogram of the tooth root with the help of a 4 magnifying glass, which reveals the abrasions of the root canal wall, against which the instrument can rest and, when rotating, perforate the canal shade. 'When perforating the wall of the Root Canal, an instrument is used to treat the canal, which is then filled with oyeoplastic materials. Before filling, to eliminate the inflammatory process in the lateral periodontium associated with perforation, intracanal electrophoresis of tincture of iodine or potassium iodide is useful.

If perforation occurs in the apical third of the root, it is usually repaired by root apex resection.

Perforation of the peri-apical tissues (apical perforation) is caused by the withdrawal of the rod instruments from the apical foramen. In this case, the patient reacts painfully. However, the pain often subsides quickly. The instrument brought out for the apex of the root is easily detected radiographically. An intact instrument is usually easily retrieved from the root canal. After that, blood or bloody fluid can be found in the lumen of the root canal. After drying the root canal, dry cotton wool is left in its lumen. If the walls of the root canal were sufficiently processed before and the patient had no complaints, and no moisture was found in the lumen of the root canal, the treatment of the tooth is completed by filling the root canal. Inadequate root canal filling

In endodontic practice, there are cases when it is necessary to unseal previously obturated root canals. Common reasons for root canal retreatment are complaints of pain when biting (as a result of the removal of the filling material by the apex of the root); underfilling of the canal; the presence of signs of destruction of bone tissue on the roentgenogram, despite the fact that the canal is filled up to the apical foramen; the need for partial unsealing of the canal under the post or stump tab.

Before proceeding with retreatment, an X-ray should be taken, which will allow you to determine the difficulties possible during retreatment. Based on X-ray data on the location and direction of the canals, as well as clinical indicators for retreatment of the tooth, tactics, method, material and instrumentation are determined. It should be borne in mind that any retreatment of root canals not only increases the deformation of the tooth, but also increases

Conservative endodontics reduces its fragility due to mechanical stress associated directly with deobturation and re-preparation and obturation of the canals.

During root canal retreatment, a dentist is faced with a number of questions. First, the rationality of retreatment and the reality of tooth preservation should be determined. Then it is necessary to find the mouth of the canals, determine their direction, the

type of material with which the canal was sealed, etc. Pay attention to the color of the material at the mouth of the canal, as well as the color of the material particles on the working part of the instrument with which the canal was examined.
In dental practice, the following methods are used to remove filling material from root canals: • mechanical - using endodontic instruments; • physical - using ultrasound and heating; • chemical - using various solvents; The mechanical method of removing filling materials should be used for partial unsealing of the root canal under the stump or post, when it is necessary to unseal the canal to a certain depth. Use both hand and machine endodontic instruments or alternate between them. Endodontic instruments such as Largo, Peeso-Reamer, Kreamer are used.
Some firms produce special sets of tools for unsealing canals.
Substantial assistance is provided by ultrasonic instruments, which allow you to loosen the intra-root pins or destroy the material inside the root canal.
Instruments with a non-working tip are used to reduce the risk of incorrect passage of the canal.
The crown part of the tooth is unsealed to provide visual access to the root canals.
The opening of the channel for the first 2-3 mm is carried out using a small spherical steel bur. The first millimeters of the canal are usually unsealed very easily.
Difficulties begin when the canal narrows and the instrument gets stuck in its lumen. In this case, it is necessary to resort to drugs that soften and dissolve filling materials.
These preparations help to remove filling materials that contain eugenol (Endosolv E, "Septodont"), resorcinol-containing resin (Endosolv R), gutta-percha (halothane, eucalyptol, xylene, chloroform). They greatly facilitate the task of softening and removing the filling material from the canal. They also use drugs that allow you to expand the lumen of the canal due to the chelating action.
Before proceeding with the chemical removal of the root filling, the crown filling must be removed. After removing the pad, it is necessary to free the root canal orifices, expand them and create a funnel-shaped depression - a reservoir for the solvent. After the introduction of the solvent into the orifice of the canal, the root filling layer softens. With the K-file, the solvent must be pushed a little deeper into the root canal opening.
The next step is to remove the softened material from the orifice of the root canal. Depending on the size of the mouth, select the appropriate K-file. After adding a fresh portion of K-file solvent of the corresponding diameter, the movements are made as when winding a watch, gradually deepening into the canal. As you get closer to the top of the root, apply a smaller K-file, following the "crown down" technique. In case of difficulties arising in the process of unsealing, the dissolving liquid can be left in the mouth or cavity of the canal with its partial passage for several days. Root apex must be confirmed radiographically or electrometrically.
If the root canal has passed through the root filling to the apex of the root, the parietal material can be removed. At the same time, it is convenient to use a tool with aggressive side surfaces - H-file. To remove the parietal material, H-file is introduced into the

Pressing the instrument against the wall of the root canal, the lateral edges are scraped off the filling material from the walls. By successively changing the H-iile to larger instruments, complete removal of the filling material is carried out.
The criterion for high-quality removal of filling material is the appearance of dentin sawdust.
In some cases, together with the filling material, it is necessary to remove metal or other intra-root retention structures - root posts and rods. They are exposed by carefully drilling the filling material around.

Breaking off tools in the root canal

Removing fragments of instruments from root canals is a complex and demanding procedure that requires a doctor's experience and considerable patience.
It is necessary to take into account a number of factors that are not always possible to fully and accurately assess: • type of instrument; • length of the tool fragment; • the degree of damage to the instrument in the root canal; • position of the tool fragment in relation to the channel axis; • the type of filling material that surrounds from breakage; • anatomy of the root canal; the technical means available to the doctor; • prognosis of treatment. In addition, the reasons for the breakage of the instrument are of significant importance: • lack of direct access to the root canal; violation of the sequence of the use of endodontic instruments; • • insufficient control over the condition of the instrument; • application of significant effort to the instrument during preparation;
• violation of the technology of using the tool; • work in a dry clumsy channel; • haste in work. The planning of the procedure for removing the fragment should begin with an analysis of the location and type of the broken instrument.
So, for example, H-She, which breaks when screwed into the root canal and gets stuck in its lumen, is more difficult to remove than K-reamer, which breaks when forced into the root canal. Canal fillers are also prone to fractures.
During the intervention, multiple correction of the applied methods and technical means is required.
The tactics of removing fragments of an endodontic instrument is determined in each case individually.
The prognosis of intervention is more favorable if the instrument is broken in the upper third of the canal, since: in this area there is enough space for approaching the fragment and grabbing it with the help of rotating instruments The fragment is surrounded by filling material, and the removal of this material leads to the simultaneous removal of the fragment of the instrument.
If the fragment is located in the coronal part of the canal or comes out with its end into the cavity of the crown, it is necessary to create space around it in order to grab it. For this, thin burs or circular burs are used. A conventional bur can accidentally cut off the end of a protruding tool. The grip of the opened instrument is carried out with a thin hemostatic clamp or special devices.
When the fragment occupies the middle part of the root canal, its extraction from the canal depends on the possibility of removing the filling material that surrounds it. The cavity of the approach to the fragment should be prepared very carefully, without

damaging or destroying part of the fragment protruding from the mouth of the root canal. With the help of the K-reamer, the position of the fragment and the possibility of access to it are determined. After the formation of the access cavity to the fragment, you can try to bypass it using the K-rearrier. Gradually, the fragment of the tool is loosened and removed with a tool of a larger diameter.

If the fragment has crashed into the wall of the root canal and is stuck, then it can be loosened either by acting on it with a tool of a larger diameter, or using a special tool (extractor), which allows you to hook the fragment of the instrument, clamp it and remove it from the canal.

Recently, a micro-welding method has been proposed, which consists in the fact that the fragment is removed by welding it to the in-channel instrument using a micro-discharge. The following technology has been developed. Two intracanal instruments are used as electrodes. They try to insert the first instrument (electrode) between the fragment and the canal wall. The second electrode is brought directly to the fragment under close visual control. After the contact of the second electrode with the fragment, a discharge occurs, as a result of which the electrode is welded to the fragment. Removal of the fragment is carried out by pulling movements. During rotation, the strength of the weld is not sufficient to remove the fragment.

This method is used when all other traditional methods are ineffective. The main condition for using this method is to provide direct access to the fragment.

If the fragment cannot be removed, then the root canal passes and expands next to the fragment.

The use of ultrasonic devices is justified if the fragment is accessible and the ultrasound can effectively act on it.

If the fragment of the instrument is in the apical part of the canal, the prognosis of its extraction is much worse. It is necessary to avoid pushing the fragment beyond the apical foramen.

The exit of a foreign body beyond the root apex into the periapical space makes it difficult to extract it from the root canal.

In cases where attempts to remove a fragment of the instrument from the root canal were unsuccessful, apical surgery and dissection of the apical part are indicated.

Often the compromise and the only real result of all manipulations is the preservation of the fragment with its inclusion in the filling material of the root canal.

When a partial effect of treatment is achieved, the forced removal of a fragment can create new difficulties, which are expressed in additional breakage of instruments, the creation of ledges, perforations, weakening of the tooth root, and expansion of the physiological opening.

Removing instrument fragments from a root canal is a laborious and complex process, often requiring several hours and sometimes several visits.

CHANGE IN TOOTH COLOR AFTER ENDODONTIC TREATMENT

Teeth discoloration is most often due to improper endodontic treatment. Discoloration (discoloration) of hard tissues of an endodontically treated tooth occurs as a result of a number of reasons, including: • tooth depulpation; • filling the root canal with materials that change the color of the tooth (resorcinol-formalin, zinc-

eugenol and other pastes); • imposition of gaskets and filling materials containing silver; • pins made of base metals, fragments of endodontic instruments. Most often, the color change is caused by pulp necrosis when hemolysis of erythrocytes occurs and the products of hemolysis penetrate into the dentinal tubules, being in essence iron compounds. The latter interact with hydrogen sulfide, forming black iron sulfide. The degree of tooth discoloration varies from strong dark discoloration to slight discoloration.

When restoring teeth that have retained their full-fledged structure, but have changed color, whitening, instead of covering them with crowns and veneers, becomes a full-fledged method of choice.

In the case of devital discoloration, teeth are whitened using professional intracoronal and combined whitening (a combination of external and intracoronal). Professional whitening is usually combined with exposure to physical factors - heat, ultrasound, ultraviolet, halogen and laser radiation.

There is a whole list of compositions for whitening devitalized teeth: ether-peroxide, perhydrol, sodium perborate, sodium peroxide, carbamide peroxide, sodium hypophosphate; patented drugs - Pyrozone ("Me Kesson & Robbins"), Superoxol ("Merk"), Endopezox ("Septodont"), Hi Lite ("Shofu").

The use of bleaching compositions containing peroxide compounds gives very good cosmetic results in intracoronal bleaching.

Peroxide compounds freely penetrate through enamel and dentin, which is due to their low molecular weight, oxidation of tooth pigments by peroxide and denaturation of protein compounds contained in pigments.

Regardless of the teeth whitening technology used, the fundamental factors are: the cause of the discoloration; original tooth color; the concentration of the whitening agent; temperature; whitening time; hygienic condition of the oral cavity.

The color of the teeth requiring the whitening procedure should be assessed using the "Vita" scale.

You need to know that the whitening process cannot go indefinitely. As a rule, it is really possible to lighten the teeth by 1-2 tones on the "Vita" scale.

The whitening procedure begins with a professional cleaning of the surface of the teeth. Before the procedure, it is necessary to remove the old restorations in order to improve the diffusion of the whitening agent into the tooth and to maximize its contact with the enamel and dentin.

The technique of whitening depulpated teeth is based on filling the crown cavity with a paste-like mixture of bleaching compounds. To achieve the maximum cosmetic effect in depulpated teeth, the whitening composition should be in contact not only with enamel, but, most importantly, with dentin.

High whitening efficiency is achieved using a laser, the energy of which activates the peroxide compounds of the bleaching composition.

The teeth are whitened until a satisfactory aesthetic result is obtained, or until the so-called whitening threshold is reached, when no further noticeable discoloration of the teeth occurs.

After the whitening procedure, devitalized teeth are restored with light-cured composite materials. It should be borne in mind that whitening substances weaken the adhesion of composite materials to the hard tissues of the teeth if the restoration is carried out immediately after the whitening procedure. It is recommended to wait 1-1.5 weeks for the complete release of the enamel and dentin from the whitening agents retained in the enamel and dentin, then carry out the restoration; in such a case, the adhesion is clinically acceptable.

POSTANDODONTIC COMPRESSION

Neuropathy of the trigeminal nerve

The severe and dangerous consequences of endodontic treatment include neuropathy of the branches of the trigeminal nerve, which arises as a complication due to excessive removal of instruments and filling material into the periapical tissues or adjacent anatomical zones (mandible canal, chin foramen, maxillary sinus, choanae).

A common cause of these complications is serious errors in the technique of preparation and filling of root canals:

Conservative endodontics + 129 • errors in determining the working length of the tooth; • violation of the rules of apical preparation; • excessive opening of the apical support or its absence; • violation of the technique of root canal obturation; • ignoring diagnostic X-ray examination or erroneous interpretation of its results; • use of medicinal and filling materials containing chemical toxic components. Clinical manifestations of neurological complications during the removal of the filling material outside the root canal depend primarily on the group belonging of the affected teeth, which is explained by the peculiarities of the anatomical and histological structure of the jaw bone tissue and its innervation.

In the development of neurological complications during endodontic interventions, the initial state of the periapical tissues is of no small importance. It is impossible not to take into account the damaging effect of the filling material on healthy bone tissue. An excessive amount of filling material, which has a mechanical, chemical-toxic, allergenic effect, contributes to the development of an inflammatory and destructive process in bone tissue.

The most common complication is acute compression-toxic neuropathy of the lower alveolar nerve - a severe consequence of excessive removal of filling material into the periapical tissues, the canal of the mandible or the chin foramen.

The penetration of the filling material into the cells of the cancellous substance of the bone of the upper jaw due to the compression-toxic effect leads to necrosis and, as a consequence, the occurrence of pain syndrome.

During endodontic treatment of premolars and molars of the upper jaw, it is possible for filling material to get into the cavity of the upper jaw or into nearby tissues; in this case, the development of the process along the length is observed.

Removal of the filling material behind the root apex in the treatment of incisors and canines of the upper jaw leads to the development of infraorbital nerve neuropathy, which is also accompanied by a pronounced autonomic reaction.

Treatment of patients in such cases should be started as early as possible with intensive care, treating this disease as an emergency.

V- semester.

1- Practical lesson

Topic: Sterilization of endodontic instruments. Endodontic instruments. Classification...

Training lesson technology (practical lesson)

Time: 120 minutes	*Number of students: 10-12*
Type and form of training session	Practical lesson
Structure of the lesson	1. Introduction. 2. Theoretical part 3.Analytical part: - organizer Cascade and diagram VENNA -Test and Situational Task 4.Practical part
The purpose of the lesson:	- have the concept of sterilization of endodontic instruments, types of endodontic instruments.
The student should know:	- the concepts of specific methods of sterilization of endodontic instruments, types of endodontic instruments, classification of endodontic instruments
The student should be able to:	-distinguish endodontic instruments - way of sterilization of endodontic instruments
Tasks of the teacher: - have an idea of the way to sterilize endodontic instruments, types of endodontic instruments, classification of endodontic instruments - explain the	*Learning outcomes*: - has the concept of a specialty of sterilization of endodontic instruments, types of endodontic instruments, classification of endodontic instruments - will master the classification of endodontic instruments

way to sterilize endodontic instruments - show endodontic instruments	
Teaching methods	Lecture, brainstorming, story, video method, practical lesson, work with a book, dialogue, educational games, pinboard. organizer.
Forms of education	Group work ("Learning Together", "Work Together-Change Ideas"), single
Teaching aids	Board-stand, flipchart, video films, writing board, model, dummies, graph, diagrams, diagram, notes, control sheet, texts.
Study conditions	Specially equipped rooms.
Monitoring evaluation	Oral survey: express test, written survey: test

Questions on the topic:

1. How are the instruments styled?
2. What solutions are used for sterilization.
3.How long does it take to sterilize with AIDS.

Tests:

Determine the composition of the "triple solution" and which is used to sterilize dental instruments:

10 g sodium bicarbonate 20 g formalin, 3 gphenol, 1000 ml dist. Water

15 g sodium bicarbonate, 15 g formalin, 2 gphenol, 1000 ml dist. Water

15 g sodium bicarbonate, 12 g formalin, 12 gphenol, 1000 ml dist. Water

10 g sodium bicarbonate, 0.5 g formalin, 3 gphenol, 1000 ml dist. Water

Sterilization application:

All answers are correct

For neutralization of cutting tools

For neutralizing dental mirrors

For neutralization of metal tools

Using physical parameters to disarm instruments.
All answers are correct
Ultraviolet ray
High to, ultraviolet ray
Ultrasonic sterilization
Physical methods of sterilization include:
All answers are correct
Steam room
Dry air
Infrared radiation
Determine the correct size of the dental room height:
3.3 m
4 m
2m
2,5m
UTE rate for dentists working 6 days a week:
21.0
18.0
24.5
27.0
How much m2 is allocated for one armchair?
14 m2
12 m2
13 m2
26 m2
How much m2 is allocated for an additional chair?
7 m2
5 m2
9 m2
6 m2
At what height can the walls be painted with oil paint:
2.5 m
3.5 m
3m
2 m
A dental mirror is sterilized on a triple solution:
40-45 minutes
30-35 minutes
20-25 minutes
10-15 minutes
Autoclave sterilizes:
Cotton wool, gauze
Probe

Tweezers
Ironer

The composition of the ternary solution:

Sodium bicarbonate, formalin, phenol
Iodine, chloramine, hydrogen perix
Alcohol, iodine, dist. Water
Glycerin, iodine, 3% hydrogen peroxide

A dental mirror is sterilized in a triple solution:

40-45 minutes
20-25 minutes
30-35 minutes
10-15 minutes

In dry steam it is sterilized:

All answers are correct
Corkscrew, trowel and probe
Tweezers, metal spatula
Excavator, double-sided trowel

Determine the physical factor:

All answers are correct
Ultraviolet ray
Heat
Ultrasound

identify chemical neutralizers

All answers are correct
Iodine
Chloramine
Alcohol

A doctor's office for one dental unit must occupy an area of at least

1) 10 m2
2) 12 m2
3) 14 m2

The height of the cabinet must be at least

1) 2 m
2) 3m
3) 4 m

Light coefficient (the ratio of the glazed surface of the windows to the floor area)

should be

1) 1: 1 - 1: 2
2) 1: 3 - 1: 4
3) 1: 4 - 1: 5

The illumination level of the cabinet when using fluorescent lamps should be

1) 200 lux
2) 300 lux
3) 500 lux

The illumination generated by the local source should not exceed the general illumination level by more than

1) 5 times
2) 10 times
3) 15 times

The modern dental unit includes

1) dry oven
2) automatic chair
3) reflector lamp
4) doctor's desk
5) compressor and devices for carrying out the necessary manipulations in the mouth

The workplace of the dentist, working without an assistant, is located in a position in relation to the patient

1) for 6 hours
2) for 9 o'clock
3) for 12 o'clock

Sterilization of dental instruments is carried out in sequence

1) dry heat sterilization
2) cleaning tools from mechanical, protein, grease contamination (manual, ultrasonic)
3) soaking instruments in a disinfectant solution

What research methods in clinical dentistry should be classified as the main ones?

A). Inquiry;
B). X-ray;
V). Electroexcitability of tooth pulp.

What methods of examining patients are considered additional?

A). Sounding;
B). Inspection;
V). Temperature test.

What information can be obtained by probing a carious cavity?

A). Determine the mobility of the tooth;
B). The presence of changes in the periodontium;
V). Determine the depth of the carious cavity.

Name the means used to disinfect carpool metal injectors by wiping with a sterile cotton ball:

A). 700 with alcohol;
B). 1% iodinol;

V). 2% lidocaine.

Specify the clinical signs of patients fainting during dental intervention:

A). Dizziness, tinnitus, cold sweat, shortness of breath, feeling of "lump in the throat".

B). Redness of the skin, itching;

V). Swelling of the soft tissues of the face, eyelids, lips.

List the dental instruments used for examining the oral cavity:

A). Ironer;

B). Mirror;

V). Stopper.

How is the dressing sterilized (cotton rolls, gauze swabs, napkins, and others)?

A). Autoclaving;

B). In a dry heat cabinet;

V). By boiling.

Specify the equipment of the therapeutic dental office?

A). Dental unit, chair, special set of instruments, sterilizer, etc .;

B). Operating table, anesthesia machine, phonendoscope, oxygen cylinder, etc .;

V). X-ray apparatus, orthopantomograph.

Which dental instruments can be cold sterilized?

A). Burs, endodontic instruments;

B). Probe, tweezers, trowels;

V). Mirrors, cutting tools.

Situational tasks:

1. Patient N. was admitted to the clinic with nocturnal pain. She was diagnosed with acute pulpitis diffusion and was treated. During treatment, the doctor began to suspect that the patient had an AIDS infection.

A) How are the instruments styled?

B) What solutions are used for sterilization.

C) How long does styrilization take?

Interactive method

USING THE HANDLE IN THE MIDDLE TABLE METHOD

All students of the group are divided by lot into 3 subgroups of 3 students each. Each subgroup sits down at a separate table, prepares a blank sheet of paper and a pen. The date, group number, last name and first name of the student are written on

the sheet. The task is offered, to answer one question for the whole subgroup. Each student writes down his last name and one answer option on a sheet and passes the sheet to a neighbor, and moves his pen to the middle of the table. The teacher supervises the work of the group and everyone's participation in it. The general correct version is written down in a notebook. Students who gave the correct answer options receive the maximum score - 100% of the theoretical part rating - 0.8b. Second place students - 85.9% of the rating. Third place - 70.9% of the rating. Those who did not answer or answered incorrectly 30% of the rating. The score received is taken into account when assigning marks for the current lesson. Student works are saved by the teacher

TEXT

ENDODONTIC INSTRUMENTATION

There are many criteria that allow the classification of tools: their length, flexibility, shape of the working part, method of actuation (manual, machine), etc. However, the main of them should be considered the purpose. On this basis, tools are divided into 5 groups:

1. To expand the mouth of the canals
2. For the passage of the root canal
3. To expand the root canal
4. To determine the size of the channel
5. For filling the root canal

It should be noted that this subdivision is rather arbitrary, since many tools can be used to perform various operations.

STERILIZATION OF ENDODONTIC INSTRUMENTS

The cycle of application of endodontic instruments recommended by the manufacturers:

1. Application

The tools should be used in strict accordance with the rules: the angle of rotation in the channel of the K-type tool is 45-180 °. H-files cannot be rotated in the channel. Profiles and GT files should only be used with a special lowering tip, etc.

2. Disinfection

Soaking in a solution of "Biolot" (5 g per liter of water) at a temperature of 50 ° C for 15-20 minutes; in a mixture of a 3% solution of hydrogen peroxide and 10% ammonia in a 1: 1 ratio with the addition of detergents "Lotos", "Astra", etc. at room temperature, soaking time - 1 hour. Do not leave instruments in disinfectant solution overnight or on weekends. Chloroform, sodium hypochlorite and phenol-containing disinfectants (carbolic acid, etc.) should not be used for treatment. After disinfection, the instruments are rinsed with running water.

3. Cleaning

It can be done manually with a brush, but it is more preferable to use ultrasonic cleaning devices ("Earring", "Sona-Rex"), the processing time in such an apparatus is 15 minutes. After cleaning, the instruments are washed again with running water, then with distilled water and dried.

4 and 5. Visual inspection and rejection

Criteria for rejection of endodontic instruments.

- plastic deformation of the tool;
- pre-curved tools;
- untwisted tools;
- damage to the cutting edge of the tool;
- dull blade of the working part, as evidenced by the shine of the cutting edge.

Bullet extractors and instruments smaller than ISO # 10 are disposable and must be discarded after a single use.

6. Sterilization:

1) Autoclaving: hot saturated sterilization

steam under a pressure of 2 atm., temperature - 120 °, time - 30 minutes.

2) Dry heat sterilization: temperature - 180 °, time - 1 hour:

3) Using a glassperlen sterilizer (device from the "Anti-AIDS" program): temperature 240-270 °, time -10 sec. With this method, only the working part of the instrument is sterilized, so it can be used only as an auxiliary tool for operative sterilization during operation.

4) Method of "cold" sterilization: carried out by immersing instruments in an antiseptic solution for a certain time.

- Chlorhexidine solution 0.1% - 45 min.
- Solution of hydrogen peroxide 6% - 45 min.
- Ethyl alcohol 70% - 30 min
- "Glutaral" - 15 min.
- "Sidex" - 15 min.

5) Burning the tool on a flame: this is how silver pins are sterilized before use.

STERILIZATION OF GUTTAPER PINS

Since gutta-percha is the material of choice for root canal filling, sterilization of gutta-percha points is of great importance for endodontic practice. Since during filling this material can directly contact the periapical tissues, it should not be a source of spread of pathogenic microorganisms. It was found that 8% of the sold gutta-pepper pins, when removed from the package, are contaminated with pathogenic microorganisms. Gutta-percha cannot be sterilized by heating and must be sterilized quickly and directly at the dentist's workplace. Soaking gutta-percha points in 5.25% sodium hypochlorite solution (undiluted household bleach) for 1 minute very effectively destroys vegetative forms of microorganisms and spores.

INFLUENCE OF REPEATED STERILIZATION ON INSTRUMENTS

Several studies by G.M. Barer, I.A. Ovchinikova, V.A. Zavyalova, V.G. Masliy, 2003) studied the effect of resterilization on the physical properties of endodontic files. Resterilizing stainless steel files using any of the heating methods described in this chapter will not corrode, reduce strength, or increase damage during operation.

Evaluation Criteria for Monitoring

	Progress in%	Grade	Student knowledge level

o.	and points		
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully

			versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfy tally "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine .	55-60	Satisfy tally "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

2- Practical lesson

Topic: Tools for expanding root canals. Instruments used to remove the pulp.

Training lesson technology (practical lesson)

Time: 120 minutes	*Number of students: 10-12*
Type and form of training session	Practical lesson
Structure of the lesson	1. Introduction. 2. Theoretical part 3.Analytical part:

	- organizer -Test and Situational Task 4.Practical part
The purpose of the lesson:	- have the concept of types of instruments for expanding root canals and instruments used for removing the pulp.
The student should know:	- concepts of types of instruments for expanding root canals and instruments used for pulp extraction
The student should be able to:	-distinguish between instruments for expanding root canals and instruments used for removing the pulp
Tasks of the teacher: -to have an idea of tools for expanding root canals and tools used for pulp extraction - explain the instruments for widening the root canals and the instruments used for pulp extraction - instruments for widening root canals and instruments used for pulp extraction	*Learning outcomes*: - has the concept of tools for expanding root canals and tools used for pulp extraction
Teaching methods	Lecture, brainstorming, story, video method, practical lesson, work with a book, dialogue, educational games, pinboard. organizer.
Forms of education	Group work ("Learning Together", "Work Together-Change Ideas"), single
Teaching aids	Board-stand, flipchart, video films, writing board, model, dummies, graph, diagrams, diagram, notes, control sheet, texts.
Study conditions	Specially equipped rooms.
Monitoring evaluation	Oral survey: express test, written survey: test

Questions on the topic:

1. K-Fi1e nitifeex is used for ...

2 Properties "Endosonore file"

3.Profiles

.Preparations for drug treatment of root canals must meet the following requirements, except

have an odontotropic effect *

have a sensitizing effect *

have a bactericidal effect on microorganisms in the canal

have the ability to deeply diffuse into the dentinal canals

The criteria for creating correct root canal access include, except

partial removal of the roof of the pulp chamber *

diverging access walls *

localization corresponding to the topography of the pulp horns

shape corresponding to the topography of the pulp chamber

The reference points for straight-line access to the canal mouths are, in addition to

number of bumps *

pulp horn topography *

tubercle of a tooth

pulp horn

The purpose of root canal cleaning and irrigation is

maximum removal of bacteria from the canal system

excision of the most infected layers from the walls of the root canal

removal of bacteria only from lateral canals

toxic effect on periodontal canals

When instrumental processing of root canals, errors and complications occur, exclude unnecessary

uniform conical root canal expansion *

preserved spatial topography of the channel lumen *

channel wall perforation

change in the size of physiological constriction

What instrument is used to remove coronal pulp:

1) excavator*
2) trowel
3) corkscrew
4) probe
5) putty knife

.What instrument is used to remove coronal pulp:

1) spherical bur *
2) trowel
3) corkscrew
4) probe
5) putty knife

What tool are used to smoothen and expand the walls of the root canals

drill *

pulp extractor
excavator
drilbor

What is Taper Needle

sweep *
drilbor
rasp
drill

What instrument is used to measure the length of the root canal

depth gauge *
drilbor
rasp
drill

What tool simplifies the work of drilbor

rasp *
drill
drilbor
scan

Contra-angle tools

drilbor, drill *
drilbor
boers
rasp

Situational tasks:

1. Patient A., 27 years old, complained of caries and food debris in the hole. When examined, it was determined that the tooth on the right side of the upper fifth tooth has a hole. In order to make the diagnosis, you need to know:

A) What is the number of the tooth according to the WHO method:

1.11

2.14

3.20

4.15 *

5.17

B) select the method of additional verification with a rough diagnosis.

C) To determine the depth of caries, you need to know.

Interactive method

USING THE WEB METHOD

Steps:

1. In advance, students are given time to prepare questions for the lesson they have completed.
2. Participants sit in a circle.
3. One of the participants is given a skein of thread, and he asks his prepared question (to which he himself must know the full answer), holding the end of the thread and throwing the skein to any student.
4. The student who received the skein answers the question (at the same time, the person who asked him comments on the answer) and passes the baton on to

the question. Participants continue to ask and answer questions until everyone is on the web.

As soon as all students finish asking questions, the student holding the skein returns it to the participant from whom he received the question, at the same time asking his own question, etc., until the coil is completely "unwound"

Text:

ROOT CANAL EXPANSION TOOLS

K-Fi1e (Kerr drill) - (Fig. 23) is characterized by a small step of cutting edges, which distinguishes it from K-Reamer. In accordance with the accepted standard, a series of 21 sizes is produced, with a length of the working part of 21, 25, 28, 31 mm. K-FlexoFi1e GoldenMedium - (Fig. 25) a flexible channel-expander of intermediate size. The tool is used to smoothly transition from one tool size to the next. Available in 6 sizes: 0.12, 0.17, 0.22, 0.27, 0.32, 0.37 with the length of the working part 21, 25, 31 mm. Hedstroem file - Hedstrom's drill (Fig. 27.) is designed to align the walls of the root canal. Produced in accordance with ISO standard 20 sizes from 08 to 0140, lengths 21, 25, 28, 31 mm. Rotational movements cannot be done with the tool, only reciprocating movements are carried out.

Profile 04 Taper Series 29 Rotazy Instruments - (Fig. 28.) A type of rotary endodontic instrument developed by Tusla Dental Product, part of Dentsplay. According to the existing standard, which differs from the ISO standard, 13 sizes are produced (the JSO equivalent is given in brackets): 00 (060), 0 (077), 1 (100), 2 (129), 3 (167), 4 (216) , 5 (279), 6 (360), 7 (465), 8 (611), (775), 10 (1000), 11 (1293).

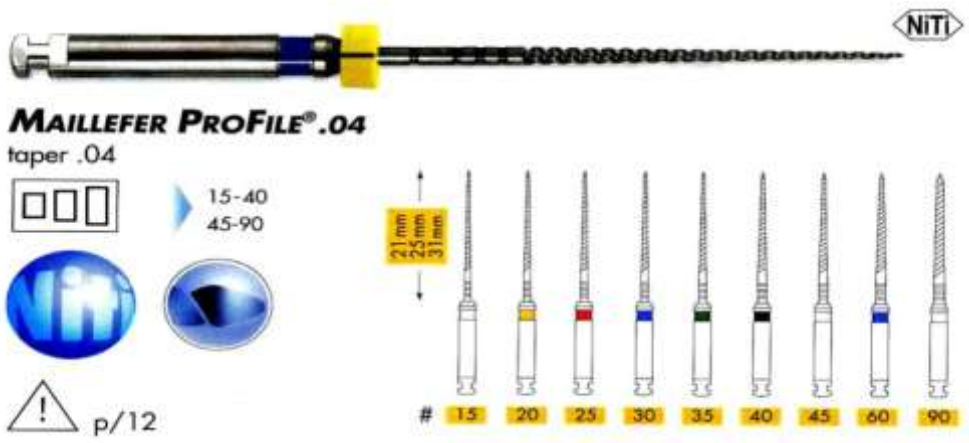


Figure 28

K-File nitifeex - (Fig. 26.) is used for the passage of very curved (up to 90º) and thin canals. This tool has a non-corrosive (blunt) tip and increased flexibility as it is made of a nickel-titanium alloy. In accordance with the standard, 10 sizes are produced: 015, 020, 025.030, 035, 040, 045, 050, 055, 060, the length of the working part is 21, 25, 31 m the previous one by 29%. This makes the effect of an even increase in the diameter of the root canal. The tools are made of nickel-titanium alloy,

which gives super flexibility and strength. The passive (blunt) shape of the tool tip keeps it in the direction of the channel even in places of greatest bending, which significantly reduces the likelihood of perforation and shoulder creation. The profiles are adapted to work with an endodontic handpiece. "S-File" (S - file, unifile, SET-H-File) - is made from a conical blank by milling and differs from the usual Headstrom file in that it has a double helical cutting edge and resembles the letter "S" on the cut. In addition, the spiral grooves on the tip of this tool are not so deep, so it is much stronger and more symmetrical. The cutting efficiency of this tool is higher than that of the H-file. The design of the S-file allows them to perform not only sawing, but also rotational movements in the canal, although, according to A.I. Nikolaev and L.M. Tsepov (2004), rotate it in the canal, like any other tool made by the method milling, should be extremely careful. Machine-made nickel-titanium analogs of S-files are also being produced, for example,

"Endosonore file" - a tool for ultrasonic expansion of the canal using special preparations. Endomatic file - files for endodontic handpieces. "GT Files" (files with maximum taper) is a development of Tulsa Dental Products (USA). They are made of nickel-titanium alloy, have a specially designed ergonomic handle and a very large taper - 3-6 times more than standard endodontic instruments. The travel of the spiral screws on the working part is the opposite, therefore, when rotating in the channel, the probability of jamming and breaking off of the tool is practically excluded. During operation, the "GT-file" moves into the canal without rotation until it stops, screwed into the canal by 0.5-5 turns counterclockwise until it gets jammed in the dentin. The file is then rotated with firm apical pressure clockwise 90 ° -180 °, a click is heard, indicating that the dentine has been cut. Then, the file is screwed back into the dentin and rotated clockwise again. Thus, the canal is processed along the entire length. The described channel processing method is called the “balanced force principle”. Another way to use "GT files" is as follows. The file is forcibly twisted into the canal clockwise. Periodically it is taken out to clean it of dentin sawdust. This channel processing method is implemented in the "GT Ro-tary Files" system. "GT files" allow complete machining of the canal with only one tool (usually 10-14 "standard" tools are required). A total of four manual "GT-files" with taper 06, 08, 10 and 12 are produced. The choice of instrument is made depending on the anatomical structure of the root and canals of the tooth.

Orifice Shapers are tools with a large taper from 5 ° to 8 ° and a short working length (19mm). Designed for safe preparation of a straight and slightly curved part of the canal, and the presence in the range of six instruments P 6,5,4,3,2,1 with apex diameter 0.80; 0.60; 0.50; 0.40; 0.30; 0.20mm accordingly will allow us to sequentially widen the canals from the orifice to the apical foramen using the Crow Down technique. The continuous improvement of endodontic instruments, taking place in recent years, is aimed at realizing the long-standing dream of endodontists around the world to create universal and ideal files for preparation with a minimum number of their varieties. The emergence and further evolution of nickel-titanium rotating files led to the creation of conceptually new Pro Tarer instruments.

These tools do not conflict with the concept of profiles 04, 06 JIT and others. They perfectly complement the previous assortment, having a special purpose - especially difficult for preparation with traditional instruments, highly calcified, curved and "S-shaped" canals (VB Johnson 2001).

Benefits of the ProTapers: The patented progressive tapered file shape offers improved flexibility and exceptional cutting efficiency, which is especially important when working in narrow or highly curved canals.

Only a few instruments are required to obtain a tapered preparation along the entire length of the canal.

During operation, the ProTapers capture a small portion of the dentin from the root canal walls, reducing torsional stress and file fatigue, thereby preventing the possibility of file breakage.

The triangular, convex cross-section of the instruments reduces contact between the file and the dentin of the root canal.

Specially designed guide tip.

DESIGN FEATURES PROVIDING BENEFITS

The advent of the new Pro Tare instruments has revolutionized the procedure for the preparation of root canals.anal. The basic series includes 3 instruments for shaping the coronal part of the root canal and 3 instruments for final preparation.

FORMING FILE X.

The auxiliary shaping file is introduced in the direction

canal and specify the direction of the root canal. Improving,thus, accessing the depth of the canal, passively insert the sx instrument into the depth until a feeling of slight resistance arises. Use a reciprocating motion to clean the waste materials from the apex to the crown, avoiding excessive resistance of the prepared dentin. Use the instrument until about two-thirds of the total length of the test piece is immersed in the orifice of the canal. Remember to flush the canal.

At the end of the preliminary expansion procedure and creation of good access on two thirds of the rootPlease use Pre-Curved K-File No. 10 to finalize the working length. After confirming the working length, lubricate the canal with glide lubricant and finally calibrate using the full working length S1 shaping file.

After using the S1 shaping file, rinsechannel and use the S2 shaping file with a white ring on the shank. Typically, this file is immediately entered over the entire working length. Flush the canal after using the instrument.

After the coronal two-thirds of the canal has been prepared, the final preparation can be started.the apical third. To do this, use the finishing file # 1 (f1) with a yellow ring (iso 020). Carefully insert the f1 instrument into the irrigant-filled canal to the working length and then withdraw immediately.

Determine the diameter of the apical constriction by placing in the canalmanual K-file No. 20. If the tool fits snugly along the entire working length, then

the diameter of the apical constriction corresponds to iso 020, and canal is ready for obturation. If the file is free for the entire working length, then use the file for finishing No. 2 (f2) with a red ring (iso 025). Rinse the canal and continue the

preparation with the f2 instrument to the working length. Then, determine the diameter of the apical constriction by placing the manual K-file No. 25 into the canal. If the instrument fits snugly along the entire working length, it means that the diameter of the apical constriction corresponds to iso 025 and the canal is ready for obturation. If the file is free for the entire working length, then use the file for finishing # 3 (f3) with a blue ring (iso 030). Carefully insert it to the working depth and carry out the same procedure for determining the diameter of the apical constriction with the manual c-file No. 30. Usually, the diameter of the apical constriction depends on how much you widen the calcified or curved canal.

V.N. Chilikin, A.V. Zoryan and A.P. Ovsepyan (2007)that with the growing popularity of the crown-down technique, steel instruments with a taper of 2% began to be used only for the initial passage of the root canal and the formation of the so-called carpet path, i.e. free path for nickel-titanium tools with increased taper.

At the stage of creating a "carpet path", the doctor also faces certain dangers: for example, whenBot with one of the most popular systems of nickel-titanium instruments today - Pro Tarer, manufacturers recommend preliminary expanding the root canal to iso 15, but many experts note that this is not enough for safe work. The thing is that the tip of instruments No. 15 has a size of 0.15 mm, and the tip of the first instrument of the Pro Tarer - S1 system is 0.185 mm, therefore, if the protocol for using the instruments recommended by the manufacturers is followed, the instrument may jam and break. In this regard, we consider it justified to use hand-held steel tools. at least up to No. 20 (and in some clinical cases - and up to No. 25) perunits getting started with the Pro Tare system. However, in clinically difficult situations, the passage of the root canal with the K-file No. 20 is not always possible. Dent-sply Maillefer in 2006. Introduced a new line of tools called "Senseus", which includes both the well-known Flexo File, Flexoreamer and Hedstroem to dentists, and the brand new Pro Finder tools. The hallmarks of all Senseus tools are large and comfortable silicone handle, increased the flexibility of the working part, the non-aggressive Batt guide tip and special calibration rings that allow you to accurately determine the depth of the instrument insertion. The ergonomic silicone grip improves tactile feedback and allows you to securely hold the instrument when working with gloves, and the modified tip allows you to safely work even in the most anatomically challenging canals. The main interest, especially among users of nickel-titanium files with increased taper, is aroused by the Pro Finder tools specially designed for the initial passage of the root canal and ensuring optimal conditions for its subsequent preparation. The Pro Finder does not have a 55 ° nib angle like all other senseus instruments, but 65 °, in addition, the profinder tip has a double taper at the tip, it is larger, than the rest. This reinforced tip area and high flexibility of the instrument reduce the resistance to insertion of the instrument into the root canal, prevent breakage and blockage in the root canal, and prevent root canal movement. Profinder instruments are available in three iso sizes - 10, 13 and 17, which facilitates the creation of a "carpet" in highly calcified canals, where the standard transition from instrument to instrument in the sequence No. 10 - 15-20, after root canal treatment is often quite problematic Pro Finder No. 17 the doctor can safely switch to

using the Pro Tarer system. and also prevent the movement of the root canal. Profinder instruments are available in three iso sizes - 10, 13 and 17, which facilitates the creation of a "carpet" in highly calcified canals, where the standard transition from instrument to instrument in the sequence No. 10 - 15-20, after root canal treatment is often quite problematic Pro Finder No. 17 the doctor can safely switch to using the Pro Tarer system. and also prevent the movement of the root canal. Profinder instruments are available in three iso sizes - 10, 13 and 17, which facilitates the creation of a "carpet" in highly calcified canals, where the standard transition from instrument to instrument in the sequence No. 10 - 15-20, after root canal treatment is often quite problematic Pro Finder No. 17 the doctor can safely switch to using the Pro Tarer system.

And the last thing. All recent publications onendodontic treatment, our foreign colleagues routinely recommend starting work in the root canal with manual file No. 10.

ENDODONTIC TIPS

To work with endodontic instruments, you need

special endodontic tips that can be of three types:

Endodontic handpieces of the first type have a reduction ratio (usually 4-10: 1) and provide rotation of the instrument alongclockwise at a speed of 100 - 300 rpm.

Type II endodontic handpieces provide reciprocating movements of the tool in the channel with an amplitude of 0.4 - 0.8 mm.

Type 3 endodontic handpieces provide

read rotational movements of the instrument in the channel forward - backward within 90 ° (reminiscent of the winding of a watch).

Endodontic instruments cannot be used with conventional dental handpieces. It is recommended to useendodontic handpieces for doctors with sufficient experience and good manual skills. To master the technique of carrying out endodontic manipulations, one should start with hand instruments, and first of all, with K-files.

From the messages of A. Mamedova and M. N. Podoinikova it is known that that the endodontic handpiece "canal leader" of the set company (germany) is a multifunctional lowering handpiece with which it is possible to carry out mechanical expansion of root canals without additional use of hand instruments. This handpiece has a vertical movement of 0.4 to 0.8mm and a rotational (rotary-return) movement within 30 ° (quarter turn). Both of these types of movement depend on the speed of the micromotor (in the range of 2000-6500 rpm) and the resistance inside the root canal; the higher the resistance of the canal, the more the movement in it is limited.

For the Canal Leader tip, SET has developed special tools with rounded tops, "k" - a file for narrow canals; universalThe hedstroem canal expander is designed to expand and remove old filling material from the canal and the more aggressive hedstroem file. These tools fit into the Canal Leader at various levels. In addition, the handpiece has a device (in the form of a flow-through system for irrigation), with the help of which the canal can be flushed with the necessary preparation, in particular, sodium hypochlorite solution.

Another type of endodontic handpiece is vibrating sonic handpiece Sonic Air (dream book air), developed in Switzerland in the 80s of the twentieth century. The dream book air is an air-powered handpiece that transmits acoustic waves (frequency from 1500 to 3000 Hz) along an endodontic instrument. These waves expand the canal by micro-cleavage of the hard dentin tissue, simultaneously open and clean the dentinal tubules, penetrating deeply into them. The circular movement of the file along the walls of the canal and the constant flushing of the canal with water promotes the expansion and removal of organic and inorganic waste from the canal.

The working part of the handpiece is flexible, easy to insert, intracanal sonic files with different configuration type Shaper (shaper), Rispisonic (rispisonik), Heli sonic (heli sonic). The files, having super-sharp cutting edges, allow you to expand and form the canal, including narrow and obliterated ones, as well as remove intra-apical obstructions, various pins and unseal the canal. The secure file tip completely eliminates the risk of perforation. As we have noticed, when the canals are widened, the sonic files almost never break, but they quickly become dull. It happens that a small file (No. 10) bends and may even break in the canal, but as the canal expands, the file is washed out of it and presents no problem for the dentist.

J. Tri Auto ZX automatic handpiece. Morita (Japanesei) expands the root canal and at the same time allows you to control the distance to the anatomical point of the apex. It is used in three different qualities or a combination of both: as an apex locator for measuring depth

channel bins and distances to apex (does not require an intermediate X-ray examination) and to determine the position of the instrument in the root canal of the tooth, while there is no need for preliminary calibration and you can work in a wet canal, since the ingress of blood, saliva or sodium hypochlorite is not an obstacle, as well as, as a mini - a drill for expanding the orifices of root canals and, finally, as a tool for the passage and expansion of root canals.

The device consists of the tip itself and the chargeone device. The latter ensures the operation of the handpiece in stand-alone mode. The Tri Auto ZX operates at 150 to 350 rpm. When the tooth canal is widened, Tri Auto ZX informs the doctor about the exact position of the instrument in the canal relative to the apex and automatically controls the number of revolutions. Tri Auto ZX has 3 automatic functions. With the help of "autostart and autostop" the device turns on when it enters the root canal and turns off when it is removed from it. "Car service" controls.

The point of autoreverse and turns on the reverse when it is reached (usually it is at a distance of 1-0.5mm from the apex). Besides thatth, you can automatically limit the torque in advance by defining its maximum available value (there are 8 load limits). For root canal preparation, the Tri Auto ZX handpiece uses flexible and ductile nickel-titanium profiles from Mailifer.

Evaluation Criteria for Monitoring

	Progress in%	Grade	Student knowledge level

	and points		
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows,

			speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactorily "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactory "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine .	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory 2 "	Has no exact idea. Does not know.

3- Practical lesson

Theme: Manual and rotary instruments used to expand root canals.

Training lesson technology (practical lesson)

Time: 120 minutes	*Number of students: 10-12*
Type and form of training session	Practical lesson
Structure of the lesson	1. Introduction. 2. Theoretical part 3.Analytical part: - organizer -Test and Situational Task 4.Practical part

The purpose of the lesson:	- have the concept of types of instruments and rotary instruments used to expand the root canals.
The student should know:	- concepts of species Instruments and rotary instruments used to expand root canals
The student should be able to:	-distinguish Instruments and rotary instruments used to expand root canals
Tasks of the teacher: - have an idea of the instruments and rotary instruments used to expand the root canals - explain the instruments and rotary instruments used to expand the root canals - will show Instruments and rotary instruments used to expand root canals	*Learning outcomes*: - has the concepts of Instruments and rotary instruments used to expand root canals
Teaching methods	Lecture, brainstorming, story, video method, practical lesson, work with a book, dialogue, educational games, pinboard. organizer.
Forms of education	Group work ("Learning Together", "Work Together-Change Ideas"), single
Teaching aids	Board-stand, flipchart, video films, writing board, model, dummies, graph, diagrams, diagram, notes, control sheet, texts.
Study conditions	Specially equipped rooms.
Monitoring evaluation	Oral survey: express test, written survey: test

Questions on the topic:

1. What are the endodontic instruments.
2.Types of rotary tools.

3. A common disadvantage of all types of machining tools

Tests:

Define the main part of the lighting boron machine

All answers are correct

Housing, electric motor

Hang up the lamp, fan, bald bowl

Button for speed control

What tools are used to grind teeth

burs, special discs, cutters, finishers

probe, trowel, tweezers

excavator, files

burs, slotted discs, files

what is the purpose of using ball-shaped burs

all answers are correct

for opening the carious cavity

forms supports for the tooth

opening the mouth of the root canals

what are the functions of a cylindrical bur

for opening and expanding the carious cavity

in depulpation

to fill the canal

to remove plaque

what is the purpose of the cylindrical bur

all answers are correct

to open a root canal

expansion of the carious cavity

to remove the filling

Using a reverse cone bur

All answers are correct

For opening the wall of the carious cavity

For smoothing the wall of the carious cavity

To remove the filling

Functions of cone burs

All answers are correct

for opening and expanding the carious cavity

unsealing

for cleaning carious areas

Used types of cutters in ostomy practice

spherical, cylindrical

conical, polish
back taper, oval
round

Indicate the tools for ironing the filling

Rubber fixture, carbarundum stones
Metals. cutters
cone and back cone burs
diamond burs

Specify tools grinding filling materials

finer, polish
ball-shaped burs
bur cylinder
bora cone

What burs are used to grind light-hardening fillings

Diamond burs
ball cutters, polisher
cone, cylinder boron
carborundum discs

Specify burs that open and expand carious cavities

cylinder, cone
reverse taper, spherical
ball fin
polish, finer

Determine the type of boron used for necrosectomy

ball-shaped burs
polish, finer
bora cone
boron cylinder

Specify the type of bur for filling the filling

finer bor
spherical boron
taper and back taper burs
carborundum stones

Situational tasks:

1.The patient is 18 years old. Complaints: 6 on the occurrence of acute pain during food intake, pain intensifies in the evening, especially at night. Objectively: 6 deep carious cavity, probing the bottom of the cavity is painful. During the study, the

cavity of the tooth was opened, a bleeding pulp was found. The rest of the teeth are healthy, the mucous membrane is pale pink.

1) Make a diagnosis.

2) Choose a treatment method.

3) Spend diff. diagnostics.

Interactive method

Using the Hot Potato Method

The instructor should formulate several questions. You need to make a ball out of cardboard paper. The teacher asks a question and throws hot potatoes into the student's hands, in turn, the student answers the question and throws the potatoes back into the teacher's hands. The teacher supervises the work of the group and everyone's participation in it. The general correct version is written down in a notebook. Students who gave the correct answer options receive the maximum score - 100% of the theoretical part rating - 0.8b. Second place students - 85.9% of the rating. Third place - 70.9% of the rating. Those who did not answer or answered incorrectly 30% of the rating. The resulting score is taken into account when assigning marks for the current lesson.

Text

Rotary instruments for widening canal entrances

Root canal preparation with hand instruments is often complemented by preparation using rotary instruments designed to widen the canal orifice or the coronal portion of the root canal.

The most commonly used rotary burs are Gates or Gates-glidden burs, which consist of a long shaft, a short, elongated oval head and a self-centering tip.

*Tools and systems****for mechanical treatment of the root canal***

Since the passage, expansion and formation of the root canal is laborious and time-consuming, mechanical devices are used to reduce the labor intensity and duration of treatment:

- endodontic contra-angle and straight handpieces;
- sound vibration and ultrasonic systems;

In legacy endodontic contra-angle handpieces such as the Giromatik, Endolift and Racer, the main working movements are bilateral rotational and / or return movements.

In more recent tools, such as the channel finder or Escalibur, work movements are more complex. In Escalibur, the drills move in multiple oscillatory movements (aleatory oscillations), in canapers, pulling movements are combined with free rotational movements arising from the friction of instruments. Compared to hand instruments, the use of obsolete endodontic contra-angle handpieces did not

significantly improve the quality of canal cleaning. There was also a high probability of irreversible damage to the canal walls and their perforation. The use of more modern systems made it possible to improve the quality of canal cleaning and reduce the likelihood of these complications.

A common disadvantage of all types of machining tools, in comparison with hand tools, is the loss of touch. The time savings allegedly resulting from machining have not been proven.

Ultrasound systems,designed for the expansion and cleaning of root canals, create high-frequency vibrations with a frequency range of 25,000 to 40,000 Hz. These systems are costly to use as a dedicated generator is required.

The effectiveness of the use of ultrasonic systems is based on the simultaneous action of mechanical vibrations, cavitation and chemical action of means for cleaning the channel.

The use of ultrasound systems to treat significantly curved canals increases the risk of damage to the canal walls. In such cases, it is recommended to use sound vibration systems that operate in the frequency range from 1500 to 6500 Hz and can be directly connected to the device or instrument being processed.

For the operation of both systems (ultrasonic and sound vibration), a continuous supply of water, saline sodium chloride solution or 0.5-3% sodium hypochlorite solution is required. The advantage of these systems is their high processing efficiency, especially with sodium hypochlorite solution. These systems are recommended to be used additionally when working with hand-held endodontic instruments.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly.

			Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
..	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactory "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.

ine.	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory 2 "	Has no exact idea. Does not know.

4- Practical lesson

Topic: Non-hardening and hardening products used for filling root canals. Solid materials

Training lesson technology (practical lesson)

Time: 120 minutes	*Number of students: 10-12*
Type and form of training session	Practical lesson
Structure of the lesson	1. Introduction. 2. Theoretical part 3.Analytical part: - organizer -Test and Situational Task 4.Practical part
The purpose of the lesson:	- have the concept of types of tools for filling canals
The student should know:	- concepts about the types of instruments for filling canals
The student should be able to:	-distinguish instruments for filling canals
Tasks of the teacher: - have an idea of the tools for filling the canals th -explain the tools for root canal filling - will show tools for filling canals for expanding root canals	*Learning outcomes*: - has the concept of tools for filling canals

Teaching methods	Lecture, brainstorming, story, video method, practical lesson, work with a book, dialogue, educational games, pinboard. organizer.
Forms of education	Group work ("Learning Together", "Work Together-Change Ideas"), single
Teaching aids	Board-stand, flipchart, video films, writing board, model, dummies, graph, diagrams, diagram, notes, control sheet, texts.
Study conditions	Specially equipped rooms.
Monitoring evaluation	Oral survey: express test, written survey: test

Questions on the topic:

1.Condenser-tool for….

2.Species instruments for root canal filling

3.Properties of the channel filler.

The materials for the insulating gaskets must

1) resist the force of pressure
2) increase dentin permeability
3) prevent fluid movement in the dentinal tubules and seal them tightly
4) be a temperature and chemical insulator
5) collapse under the influence of gingival and dentinal fluid

Materials for treatment pads should

1) provide anti-inflammatory, antimicrobial, odontotropic action
2) ensure a permanent seal of the underlying dentin, connection with tooth tissues, interlining and permanent filling materials
3) irritate tooth pulp
4) collapse under the influence of gingival and dentinal fluid

Classification of permanent filling materials

Group	Representatives
A) cements	1) amalgam silver
B) plastics	2) copper amalgam
B) metal	3) zinc phosphate cement
	4) silico-phosphate cement
	5) silicate cement
	6) polycarboxylate cement
	7) filled plastics
	eight) unfilled plastics
	nine) glass ionomer cement

The basis of modern composite materials is

1) methacrylic acid methyl ester
2) low molecular weight liquid epoxy resin
3) bisphenol glycidyl methacrylate (Bis-GMA)

What form of caries is the treatment pad used for?

A). Superficial caries;
B). Caries in the spot stage;
V). Deep caries.

What filling materials can be used as medical pads in the treatment of deep caries?

A). Artificial dentin;
B). Calcimol;
V). Visphat is cement.

To seal the fissures of permanent teeth, use

1) sealant and sealants
2) silidont
3) evicrol
4) silicin

For the treatment of deep caries, medicated pads are used

1) formaldehyde-containing pastes without resorcinol
2) formalin-resorcinol paste
3) calcium hydroxide preparations

Filling materials used with a gasket in permanent molars in children 6-8 years old

1) composite materials
2) silidont
3) silicin

Filling materials used without a gasket
for the treatment of permanent unformed incisors

1) phosphate cements
2) silidont
3) silicin
4) composite materials

Filling materials used with a gasket
for the treatment of permanent unformed incisors in children

1) evicrol
2) stomadent
3) acrylic plastics
4) silicin
5) silidont

In the initial forms of decay teeth caries is used

1) iodinol
2) rosehip oil
3) silver nitrate 20-30%
4) silver nitrate 0.5%
5) proteolytic enzymes

Situational tasks:

Patient A., 25 years old, the upper jaw of the right side of caries between two teeth (acute course) is diagnosed. In order to determine the correctness of the diagnosis, you need to know:

1) the formula of teeth according to WHO.
2) Spend diff. diagnostics.
3) Choose the correct diagnosis.

Interactive method

USING THE HANDLE IN THE MIDDLE TABLE METHOD

All students of the group are divided by lot into 3 subgroups of 3 students each. Each subgroup sits down at a separate table, prepares a blank sheet of paper and a pen. The date, group number, last name and first name of the student are written on the sheet. The task is offered, to answer one question for the whole subgroup. Each student writes down his last name and one answer option on a sheet and passes the sheet to a neighbor, and moves his pen to the middle of the table. The teacher supervises the work of the group and everyone's participation in it. The general correct version is written down in a notebook. Students who gave the correct answer options receive the maximum score - 100% of the theoretical part rating - 0.8b.

Second place students - 85.9% of the rating. Third place - 70.9% of the rating. Those who did not answer or answered incorrectly 30% of the rating. The resulting score is taken into account when assigning marks for the current lesson. The works of students are saved by the teacher.

Text:

Plastic non-hardening filling materials

Such material for filling root canals has a healing effect. It is assumed that when the desired result is achieved, it will be removed. The product is injected, closed with a sterile cotton ball and a temporary filling.

Types of compositions:

- On the basis of antibiotics (2-3 types), they are used to treat periodontitis. Another component is a corticosteroid that eliminates inflammation. Validity period - 3-7 days, for example - "Septomixin".
- Containing metronidazole ("Grinazol") - antimicrobial agents for the elimination of anaerobic flora. Used for periodontitis and pulpitis, require daily renewal.
- With antiseptics ("Tempopor"), they are used for filling the canals of deciduous teeth, as well as in adults for the treatment of pulpitis.
- With calcium hydroxide ("Enocal"), which have osteoplastic, bactericidal action. Prescribed in the presence of bone destruction. Replaced every six weeks until results are achieved....

*disadvantages*plastic non-hardening filling materials: do not harden in the canal, permeable to tissueliquids, dissolve in the canal, do not provide a hermetic isolation of the periodontal from the lumen of the root canal.

Fillers these materials can serve as: zinc oxide ka, white clay, petroleum jelly, glycerin, aromatic oils.

Non-hardening filling materials are used for temporary filling of canals for the treatment of periodontal diseaseit, as well as to prevent re-infection of the treated canal.

The action of the active ingredient (depending on the composition) can last from several days to 2 months.

Plastic hardening filling materials

Zinc Phosphate Cements (phosphate cement, unifas, etc.). They are used to a limited extent due to the short period of plasticity.

Zinc oxide eugenol based pastes **(**zinc oxide eugenol vaya, eodent, endometasone, estezon, tublisil).

Calcium and / or tricalcium hydroxide pastesphosphate, hydroxyapatite (bioalex, selapex, apexitis, vitapex).

Synthetic and epoxy resin based pastes (in- tradont, AN-26, AN-plus, topsil).

Resorcinol-formalin pastes(resodent, forfe- nan, foredent, neotriozinc). They are used only in multi-rooted teeth due to their staining properties.

Glass ionomer cements (Cetac-Endo, Endion, sti- odent). They are not widely used.

Plastic hardening filling materials for root canal filling.

Plastic hardening materials

Calcium hydroxide pastes: vitapex, metapex, metapasta, calasept, calsept, apexdent

Zinc oxide and eugenol based pastes - endometasone, endophilus, thiedent, eodent, zinc oxide-eugenol paste.

Resorcinol-formalin-based pastes - resorcinol-formalin paste, foredent, forfenan, rezodent, cresopast

*Plastic hardening materials include*zinc-phosphate cements, guaiacrylic cement, as well as hardening antiseptic pastes: resorcinol-formalin, paracin, c inc-eugenol, epoxy (endodent), etc.

Classification of plastic hardening materials for permanent root canal filling:

1. Zinc-phosphate cements.

2. Preparations based on zinc oxide and eugenol.

3. Materials based on epoxy resins.

4. Polymer materials containing calcium hydroxide.

5. Glass ionomer cements.

6. Preparations based on resorcinol-formalin resin.

7. Materials based on calcium phosphate.

1. Zinc Phosphate Cements

For a long time in domestic dentistry, liquid-mixed phosphate-cement was considered the most effective means for filling root canals.

The positive properties of this material included: ease of introduction into the canal, low solubility in tissue fluid, good adherence to the canal walls, radiopacity, antimicrobial activity in the first 2 days.

However, this material has very serious disadvantages:

• fast hardening (4-6 min) leads to impossibility of additional filling of the canal, if necessary;

• the material does not dissolve in case of accidental removal from the root apex;

• impossibility of unsealing the canal if necessary.

The listed negative properties negate the advantages of zinc-phosphate cements as preparations for filling canals, therefore, at present, they are practically not used for this purpose.

2. Preparations based on zinc oxide and eugenol - zinc oxide-eugenol cements (pastes)

The basis of materials in this group is liquid-mixed zinc oxide-eugenol paste. When zinc oxide is mixed with eugenol, a chemical reaction occurs to form an insoluble salt - zinc eugenolate. The paste hardens in the canal for 12-24 hours. The addition of various substances to the zinc oxide-eugenol paste allows the properties and therapeutic effect of the endo-sealant to be adjusted in the desired direction. Most often, short-term and long-acting antiseptics, corticosteroids, and radio-opaque substances are used as additives.

Zinc oxide-eugenol cements and especially ready-made combined preparations based on them (Endometasone, Cortisomol, Sialit Ultra, etc.) are highly effective endo-sealants. They can be used for canal filling both in combination with gutta-percha pins and independently.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently.

			Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells

			confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactory "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine .	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

5- Practical lesson

Topic: Features of the topographic anatomy of the tooth cavity.

Training lesson technology (practical lesson)

Time: 120 minutes	*Number of students: 10-12*
Type and form of training session	Practical lesson
Structure of the lesson	1. Introduction. 2. Theoretical part 3.Analytical part: - organizer -Test and Situational Task 4.Practical part
The purpose of the lesson:	- to have the concept of the features of the topographic anatomy of the tooth cavity.
The student should know:	- concepts about the features of the topographic anatomy of the tooth cavity.
The student must be able to	-distinguish hardening agents used for filling canals.

Tasks of the teacher: - have an idea of the structure of the cavity of the upper and lower teeth Explain the structure of the cavity of the upper and lower teeth	*Learning outcomes*: - has a concept of the structure of the cavity of the upper and lower teeth
Teaching methods	Lecture, brainstorming, story, video method, practical lesson, work with a book, dialogue, educational games, pinboard. organizer.
Forms of education	Group work ("Learning Together", "Work Together-Change Ideas"), single
Teaching aids	Board-stand, flipchart, video films, writing board, model, dummies, graph, diagrams, diagram, notes, control sheet, texts.
Study conditions	Specially equipped rooms.
Monitoring evaluation	Oral survey: express test, written survey: test

Questions on the topic:

1. Explain the structure of the cavity of the upper and lower central incisors?
2.Explain the structure of the cavity of the lower and upper canines?
3Explain the structure of the cavity of the upper and lower premolars?
4.Explain the structure of the cavity of the upper and lower first molars?

Interactive method

Using the Hot Potato Method

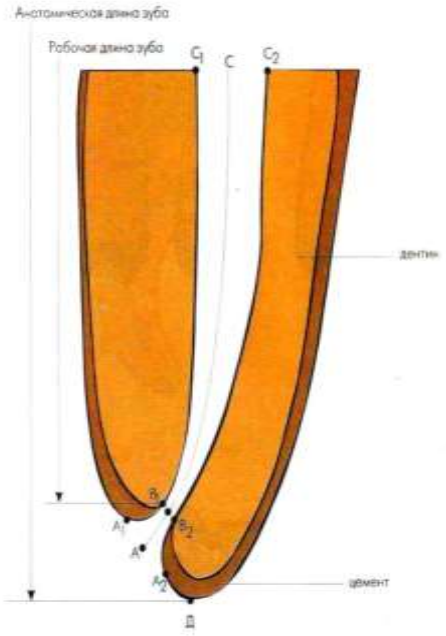
The instructor should formulate several questions. You need to make a ball out of cardboard paper. The teacher asks a question and throws hot potatoes into the student's hands, in turn, the student answers the question and throws the potatoes back into the teacher's hands. The teacher supervises the work of the group and everyone's participation in it. The general correct version is written down in a notebook. Students who gave the correct answer options receive the maximum score - 100% of the theoretical part rating - 0.8b. Second place students - 85.9% of the rating. Third place - 70.9% of the rating. Those who did not answer or answered incorrectly 30% of the rating. The resulting score is taken into account when assigning marks for the current lesson.

Text

Knowledge of the topography of the tooth cavity, the principles of preparation of the tooth cavity and root canals using modern tools and techniques, materials for filling root canals is the key to successful endodontic treatment and expands the possibilities for preserving teeth. Tooth cavity (cavum dentis). Its crown part (cavum coronale) in its structure repeats the anatomical shape of the crown of the tooth, and the shape of the root canals - the shape of the roots of the teeth. The tooth cavity communicates with the periodontium through the main root canal and additional root canals. Additional canals are opened mainly in the area of the root apex

or in the middle third of the root, as well as in the area of bifurcation (in molars). In addition to knowledge of the anatomy of various groups of teeth, it is necessary to take into account age-related changes in the structure of the tooth cavity, as well as the influence of pathological processes on its condition. The cavity of the tooth in the temporary teeth of children is distinguished by its large size, wide canals and apical foramina. During a person's life, the shape and size of the cavity change due to the plastic activity of odontoblasts - the builders of dentin. Often, in older people, the coronal part of the tooth cavity decreases in size, and sometimes completely disappears. The mouths of the canals and the canals themselves become narrowed. The root canal is divided into equine, middle and apical (apical) parts. The root part, usually the widest, is adjacent to the canal mouths. In the apical part, various variants of the canal structure are observed: its narrowing, apical bend, branching (ramification), lateral positions of the apical foramen, fusion of several canals, unclosed apical foramina, physiological or pathological root resorption. In the apical part, at the dentin-cement border, the canal ends with a narrowing (Fig. 1) (physiological apical foramen), usually located at a distance of 0.5-1.0 mm from the X-ray apex. The extreme point of endodontic intervention should be precisely this physiological narrowing, since here the pulp tissue passes into the periodontal tissue. With age, it moves further from the radiographic apex due to the deposition of secondary cement. Some authors distinguish separately the anatomical apical foramen - foramen apicale - the place of transition of dentin to cement. Sometimes the apical foramen is located laterally, vestibular or lingually - on the root wall, and not at its apex. In this case, the physiological apical foramen can be located much further from the radiographic apex (up to 5 mm), which is not recorded on a conventional radiograph. This location of the apical foramen can be determined using X-ray examination either in different projections, or after the introduction of a pre-curved endodontic instrument into the canal. Variants of the ratio of the radiological and working length of the teeth are shown in Fig. 1. In this case, the physiological apical foramen can be located much further from the radiographic apex (up to 5 mm),

which is not recorded on a conventional radiograph. This location of the apical foramen can be determined using X-ray examination either in different projections, or after the introduction of a pre-curved endodontic instrument into the canal. Variants of the ratio of the radiological and working length of the teeth are shown in Fig. 1. In this case, the physiological apical foramen can be located much further from the radiographic apex (up to 5 mm), which is not recorded on a conventional radiograph. This location of the apical foramen can be determined using X-ray examination either in different projections, or after the introduction of a pre-curved endodontic instrument into the canal. Variants of the ratio of the radiological and working length of the teeth are shown in Fig. 1.



Picture 1

In fig. 2 shows the most common classification of canals in the root of the tooth (Weine, 1976).

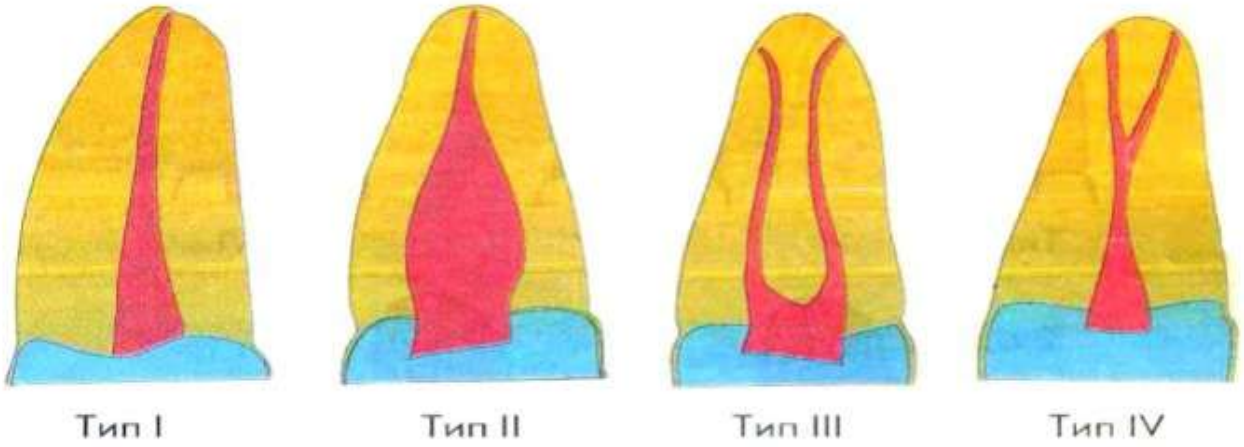


Figure 2.

Each of the proposed varieties assumes certain features of endodontic treatment. The easiest way to work with type I channels. Type II canals require special attention during obturation: one canal is obturated to the apex, the second to the confluence with the first. Type III channels are often narrower and less accessible. When instrumental processing of type IV canals, it is usually necessary to work separately in each canal with curved instruments, positioning them in accordance with the bend of the canal. During obturation, first one canal is filled, then the obturating material is removed to the site of the bifurcation of the canal, after which the remaining canal is obturated.

ANATOMY AND TOPOGRAPHY OF THE TEETH

Doctors performing manipulations in the root canals, even before starting treatment, should be aware of the possible options for their number, shape and length. Regrettably, it should be noted that insufficient attention is paid to the anatomy of the teeth, including the practically important section, the topography of the tooth cavity and the number of root canals. As a result of the prevailing stereotype, it is believed that incisors, canines and premolars, with the exception of the first premolar of the upper jaw, have one root canal, the first premolar has two, and molars have three root canals. In practical dentistry, the possibility of the existence of additional channels is almost completely ignored. The search for additional root canals is also not paid attention to because the root canals in molars, the existence of which is beyond doubt, in a significant percentage of cases, they are not sealed. We provide a table of data from mqJ, Bekland (1994) on the frequency of occurrence of additional canals, depending on the group of the tooth.

Table 1

The frequency of occurrence of additional canals, depending on the group of the tooth

4 channels	3channels	2channels	1channels	Tooth formula	4 channels	3 channels	2channels	1 channel
Lower jaw					**Upper jaw**			
-	**-**	**thirty**	**70**	**1**	**100**	**-**	**-**	**-**
-	**-**	**44**	**56**	**2**	**100**	**-**	**-**	**-**
-	**-**	**6**	**94**	**3**	**100**	**-**	**-**	**-**
-	**-**	**26.5**	**73.5**	**4**	**nine**	**85**	**6**	**-**
-	**-**	**13.5**	**85.5**	**5**	**75**	**24**	**1**	**-**
28.9	**64.4**	**6,7**	**-**	**6**	**-**	**-**	**56.5**	**43.5**
7	**77**	**13**	**3**	**7**	**1**	**2**	**57**	**40**

As follows from the presented data in the table, only the incisors of the upper jaw and the canine always have one canal. All other teeth have different variations in their number. It is always necessary to remember this and be prepared for emergency situations during endodontic treatment. These indicators indicate the need for an extremely careful search for root canals, taking into account the maximum possible number of them and all options for location. This applies primarily to the first upper painters, in most cases with bifurcations of the mesio-buccal canal, lower incisors, quite often two-channel, lower first molars, often having more than three canals. But, as can be seen from the table, deviations from the clinical topographic anatomy of the pulp cavities are found in most teeth. Quite often, such deviations cannot be detected with a conventional X-ray examination in one projection. It should be noted that the cross-section of the root canal almost never has a regular round shape. Only with age,

due to the deposition of replacement dentin, the cross-section of the canal decreases in diameter and becomes more round.

ANATOMO-TOPOGRAPHIC STRUCTURE OF TEETH CAVITIES

Insufficiently clear orientation in the topography of the tooth cavity is a common cause of poor-quality treatment.

The anatomical formula of the tooth cavity of the 1st and 2nd lower molars has a significant size and a rounded quadrangular shape, and the mouths of the canals are located so that when they join, an equilateral triangle is formed, and the fourth canal (if any) is located in the posterior (distal) root ... The cavity of the tooth of the molars of the upper jaw has a slit-like shape, squeezed in the anteroposterior direction, and the mouths of the canals are located, as it were, at the apex of an obtuse triangle. Moreover, the mouths of the anterior and posterior cervical canals are located side by side, the additional canal is usually located in the antero-cheek root. The mouths of the canals in the molars of the upper jaw form an obtuse triangle. Opening (trepanning) of the tooth cavity of the incisors and canines

produced from the lingual surface, closer to the cutting edge. The direction of the bur should correspond to the axis of the tooth and, as it were, intersect the cavity of the tooth in its center. Otherwise, the crown may be perforated. After trepanation of the tooth cavity, the hole is widened with a spherical or fissure bur, creating good access to the canal. In this case, the trepanation hole should not violate the integrity of the incisal edge. When preparing premolars, the opening of the tooth cavity should be made from the occlusal surface, parallel to the axis of the tooth. It should be remembered that in premolars of the upper jaw, the crown at the neck of the tooth is compressed in the anteroposterior direction, and the cavity of the tooth is located in the direction (from tubercle to tubercle).

For clarity, we present pictures of each group of teeth.

LETTER DESIGNATIONS:

B - vestibular.
D - distal,
M - mesial,
I-lingual surface.

The drawing of each tooth of the left half of the lower jaw is presented by the most common variant in 5 projections. In Fig. 3, these projections are numbered.

1. Longitudinal section of the tooth in the mesiodistal direction, view of the tooth from the lingual side; This projection shows the natural inclination of the tooth in relation to the vertical (horizontal) plane.

2. Longitudinal section of the tooth in the vestibulo-lingual

direction, view of the tooth from the mesial side; this projection represents the natural inclination of the tooth in relation to the vertical (horizontal) plane.

3. Top view of the tooth (crown).

4. Horizontal cut of the tooth at the level of its neck: the shape of the pulp chamber and the mouth of the root canals.

5. Horizontal section of the root (s) at a level of 3 mm from the apex.

6. Sometimes any one projection of another variant of the structure of a given tooth in endodontic aspect is presented.

The central incisor of the upper jaw.(Fig. 3). The coronal part of the tooth cavity is formed by the labial, palatal and two lateral walls. It looks like a triangular slit compressed in the vestibular-palatal direction. The arch of the cavity is defined at the level of the middle third of the crown of the tooth with three indentations directed towards the incisal edge. Towards the root, the coronal cavity narrows and becomes

single root canal. The canal of the central incisor of the upper jaw is wide, rounded in cross section. Average tooth length 25mm (23.5-25.5mm).

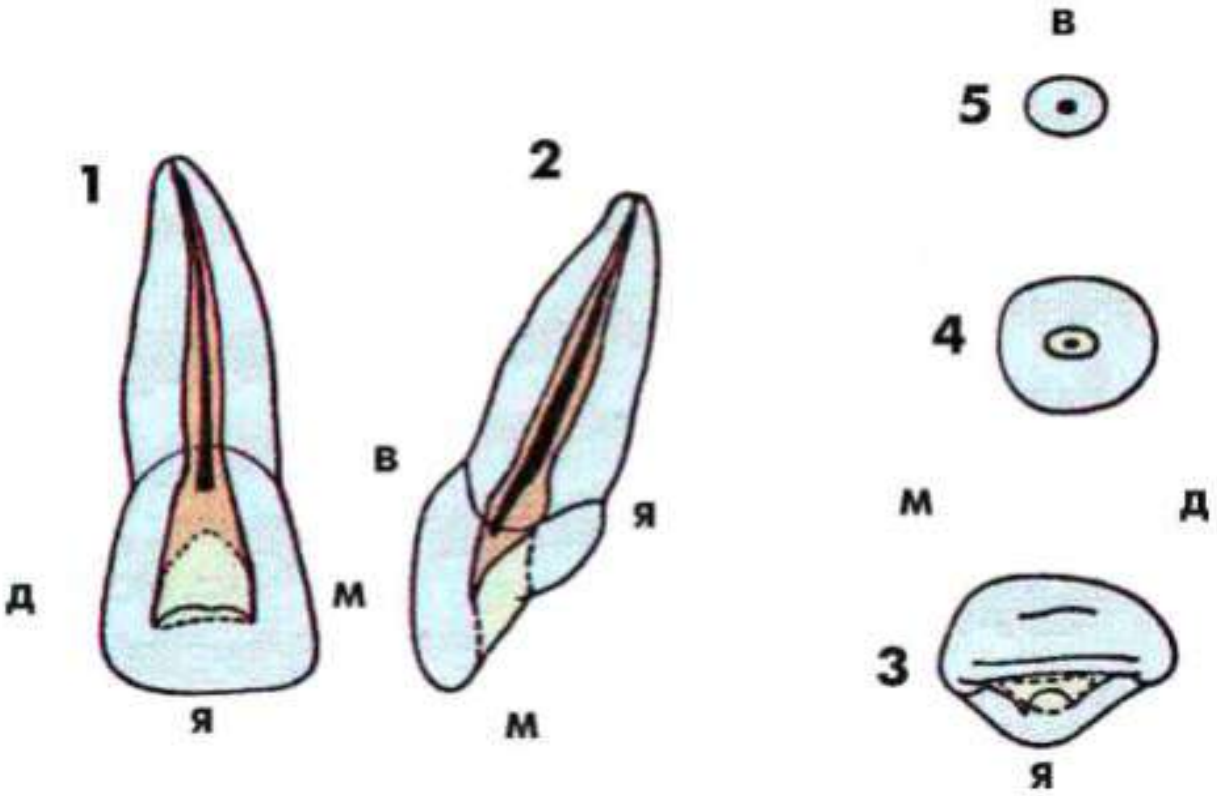


Figure 3 UPPER CENTER CUTTER (left) - VL1

Tooth length, - average - 24 mm, span 18-29 mm Number of canals 1 - 100% Lateral canals 24%

Apical deltoid ramifications 1% Apical foramen 0-1 mm from the apex 80% 1-2 mm from the apex 20%

It has 1 root and 1 canal 100% of the time. Note: The channel is 75% straight. If it deviates, then more often in the vestibular or distal direction. There is an orifice constriction that is often not easy to find. Lateral incisor of the upper jaw. (Fig. 4). The coronal part of the tooth cavity has the form of a triangle, its widest part is in the area of the tooth neck. The arch of the tooth cavity is determined along the line of the middle third of the crown, has three recesses directed to the cutting edge, respectively, its tubercles. The canal is laterally compressed, somewhat narrower than in the central incisors. On the transverse section, the canal is elongated in the vestibular-palatal direction and has an oval shape. Often the apex of the root and root canal is slightly curved in the palatal direction. An additional channel occurs in 1% of cases. Average tooth length 23mm (21-25mm), 1 root, mainly 1 canal in 99% of cases. Note: the channel is only 30% straight. At 50%, the canal deviates distally. There is a pronounced mouth narrowing.

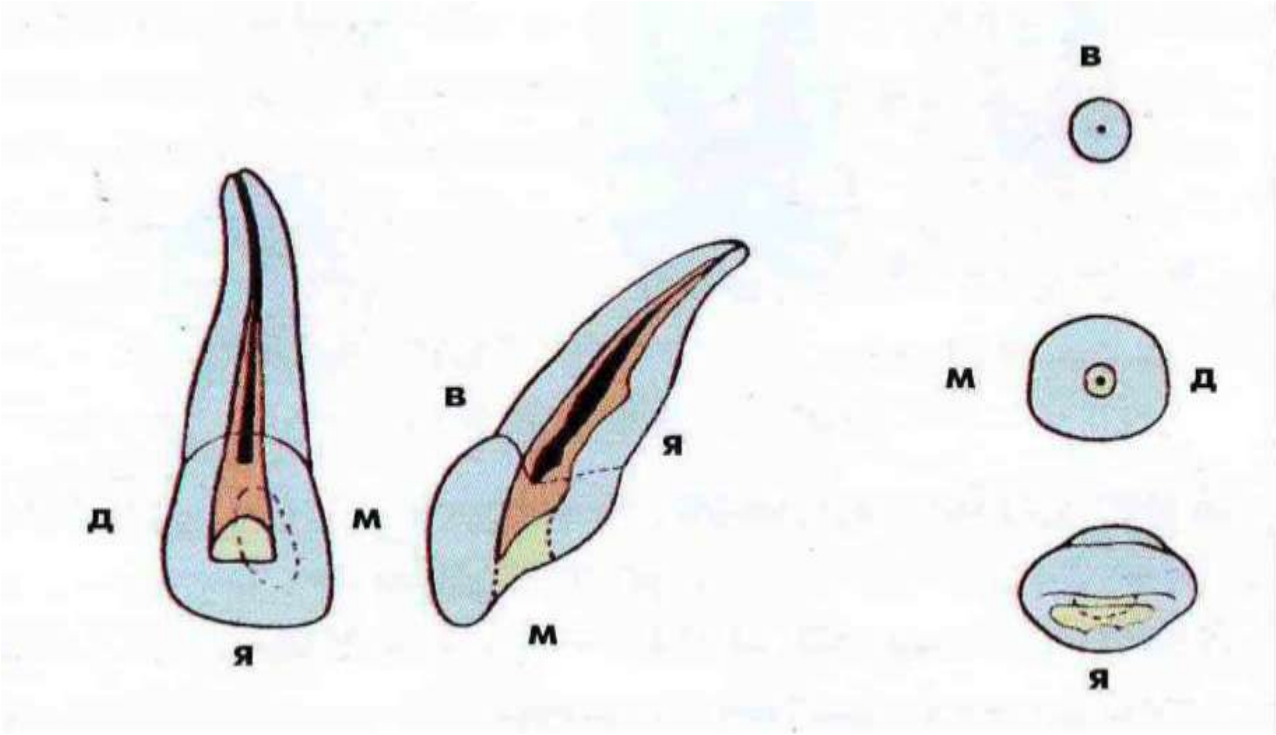


Figure 4. Tooth length: average 23 mm, span 17-29 mm Number of canals 1-100% Lateral canals 26% Apical deltoid ramifications 3% Apical foramen 0-1 mm from the apex 90% 1-2 mm from the apex 10%

Canine of the upper jaw. Rice. 5. The cavity of the tooth has a retented shape. At the level of the middle of the crown, the cavity expands, and at the level of the neck it is small. Then the cavity of the tooth, without visible boundaries, passes into a wide root canal. On a cross section, it looks like an oval, extended in the buccal-palatal direction. Often, the root and root canal in the apex area is curved in the lateral or palatal direction. The longest teeth are on average 27mm (24-29.7mm), always 1 root and 1 canal. Note: a straight root canal occurs in 40% of cases, its distal deviation - in 32% and vestibular - in 13%.

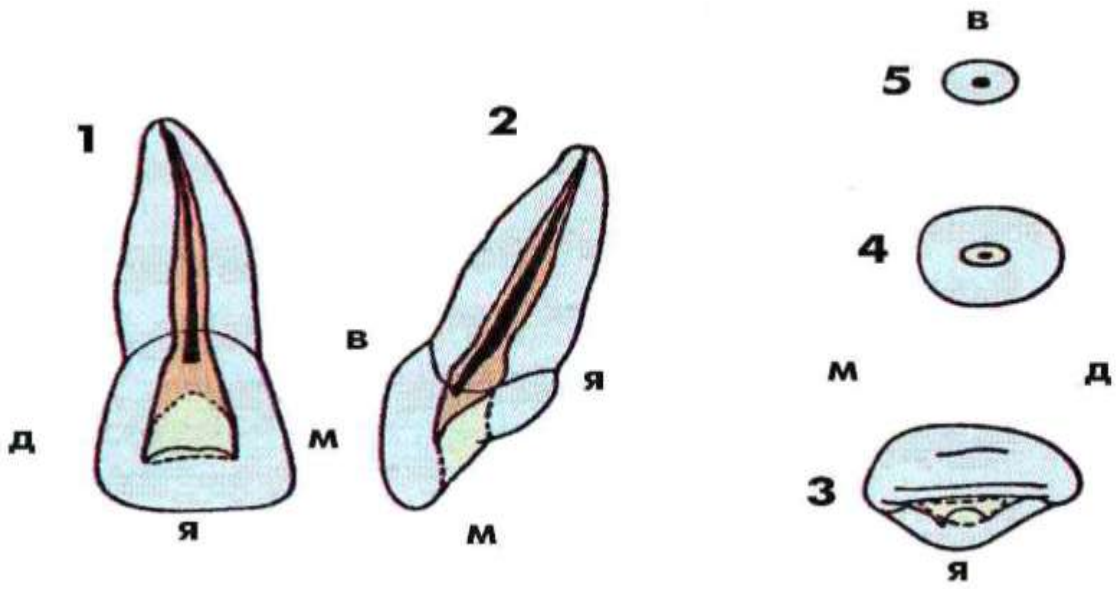


Figure 5 Tooth length: average - 27 mm, span 20-38 mm Number of canals 1-100% Lateral canals 30%

Apical deltoid ramifications - 3% Apical foramen 0-1 mm from the apex 70% 1-2 mm from the apex 30%

The central incisor of the lower jaw. Rice. 6. The cavity of the tooth resembles a triangle. The arch of the tooth cavity is located close to the incisal edge. The coronal part of the cavity smoothly passes into the root canal. Since the root of the tooth is compressed in the medio-lateral direction, the cavity of the tooth on the cross-cut has an oval or slit-like shape. The channel is narrow, often poorly passable. Average length 21mm (19-23mm), 1 root and 1 canal in 70% of cases, 1 root and 2 canals in 30% of cases.

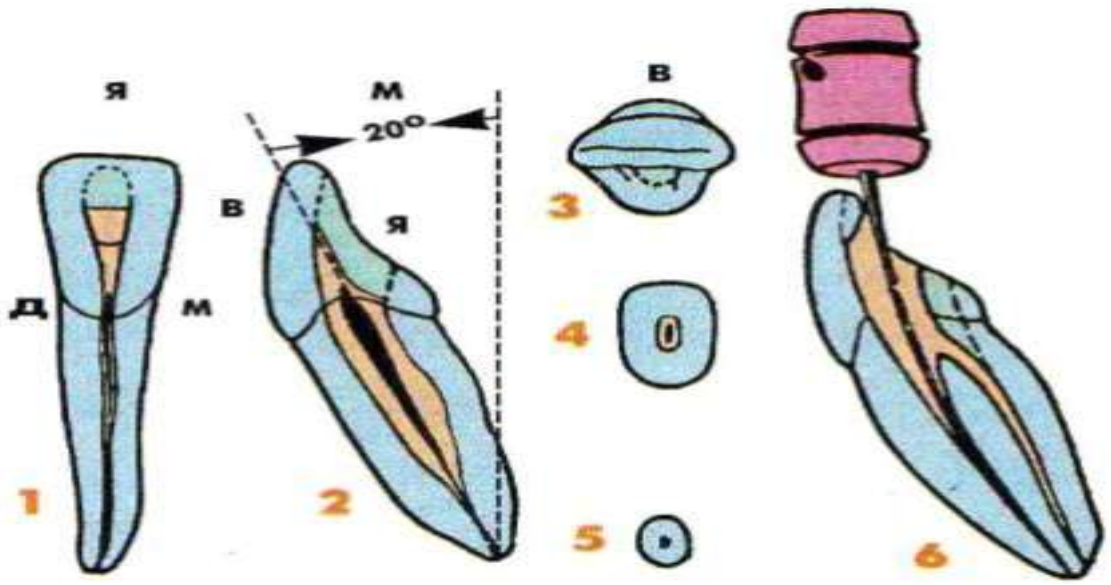


Figure 6 BOTTOM CENTER CUTTER (LEFT)

Tooth length in mm: average - 21, span - 17-25 Number and names of channels 1 channel - 65%

Lateral canals - 20% Apical deltoid I ramifications - 5% Apical foramen

0-1 mm from the apex - 90% 1-2 mm from the apex -10% 2 canals - 35%, labial, lingual 2 canals 1 hole - 27% 2 canals 2 holes - 8%

Notes: two canals located in the vesetibulo-oral direction are not uncommon in the lower incisors. A well-sealed one canal on the roentgenogram masks the one that was not found with a clear progression of periapical pathology. It should be borne in mind that the lingual canal is located quite close to the lingual surface. Therefore, the access cavity, in order to capture the lingual canal, must descend to the neck of the tooth. If there is one canal, its shape in the apical third is slit-like; if there are two, it is rounded.

Lateral incisor of the lower jaw. (Fig. 7.) The tooth cavity is slightly larger than the tooth cavity of the central incisor. The canal is oval, extended in the vestibular-lingual direction. The main difference from the central incisor is that the lateral incisor has a wider canal, often two canals are found - the vestibular and the lingual.

The average size is 22mm (20-24mm), in 67% of cases 1 root and 1 canal, in 20% - 2 roots and 2 canals, in 13% - 2 roots converging at the apex.

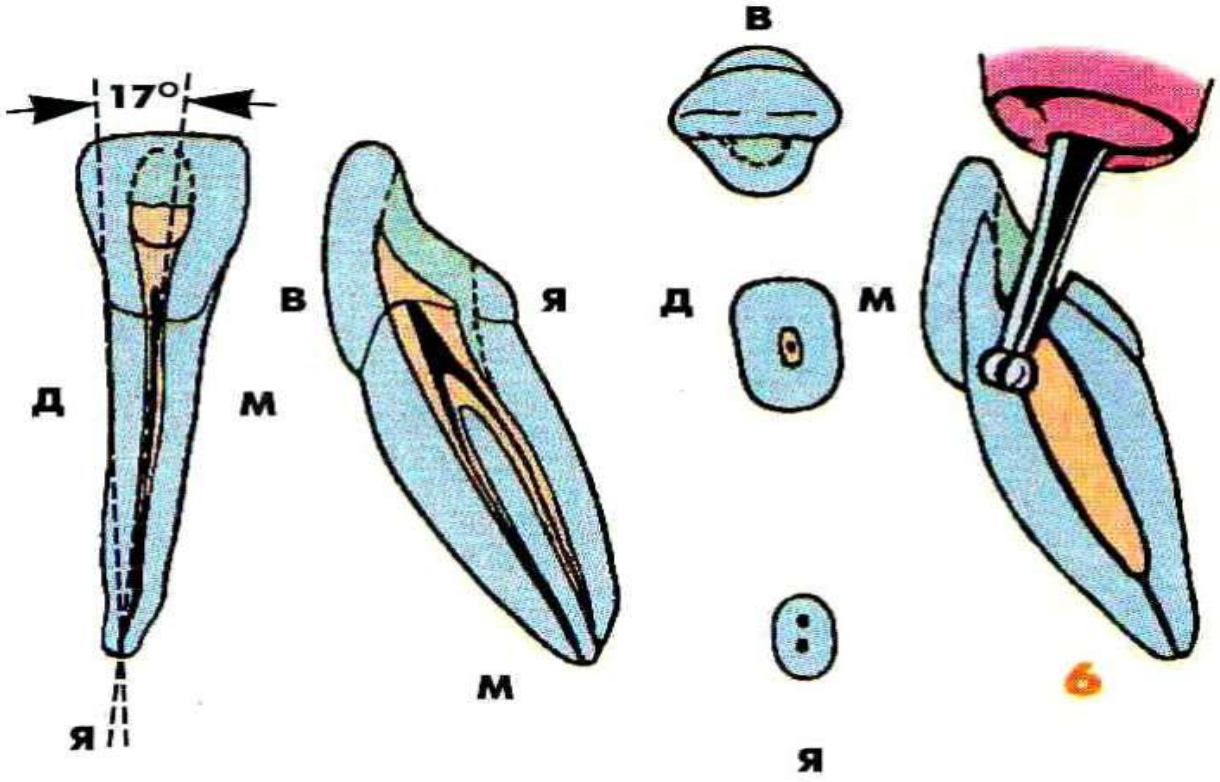


Figure 7 LOWER SECOND CUTTOR (LEFT)

Tooth length in mm average -22, span -17-27 Number and names of canals 1 canal - 57% Lateral canals - 18% Apical deltoid ramifications - 6% Apical foramen 0-1 mm from the apex - 90% 1-2 mm from the apex - 10% 2 canals -43%, labial, lingual 2 rope 1 hole - 14% 2 canals 2 holes - 29%

Notes: when developing the access cavity, it is necessary to take into account the vestibular-axial tilt of the first, second, third and mesio-axial tilt of the second and third lower teeth. Vestibulo-axial tilt and pronounced curvature of the vestibular surface can lead to the inclusion of the incisal edge of the lower anterior teeth in the access cavity.

Canine of the lower jaw. (Fig. 8.) The cavity of the tooth, like the tooth itself, has a fusiform shape. The vault has a depression corresponding to the cutting tubercle. At the level of the middle of the crown, the cavity expands. It reaches its largest size in the area of the neck of the tooth, smoothly passing into the root canal. On the cross section, the canal has an oval shape and is compressed in the mediolateral direction. Often there are two canals - buccal and lingual. Average length 26mm (23.3-28.5mm), 1 root and 1 canal in 94% of cases and 1 root and 2 canals in 6%.

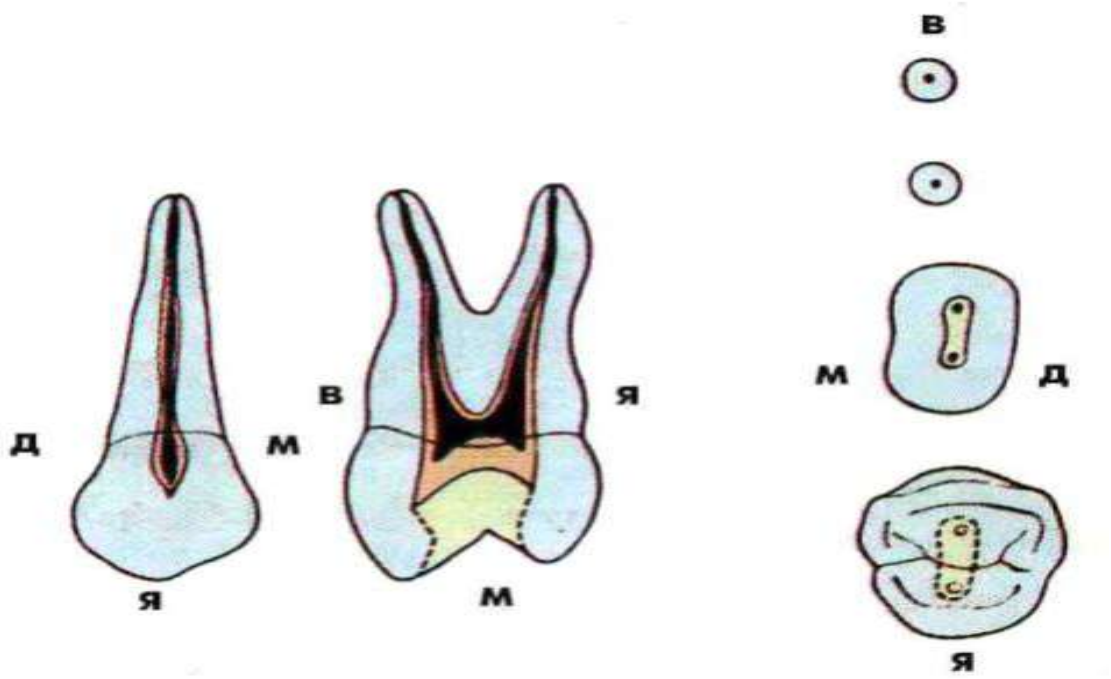
Notes: the root canal is straight and may bend in the apical part laterally by 20% and / or labially by 7%. The canal in the mouth and middle third is oval and compressed in the mesiodistal direction. The canal axis, like that of the lower incisors, passes through the incisal edge, especially in the elderly, which may require its inclusion in the access cavity. The outlines of the access cavity are elongated in the gingival-incisor direction.

Maxillary first premolar... (Fig. 9.) The coronal cavity of the tooth is compressed in the anteroposterior direction, has the shape of a slit, elongated in the buccal-palatal direction. In it, the arch of the tooth cavity, the bottom and four walls are distinguished. The vault of the cavity is located at the level of the neck of the tooth, has two protrusions, respectively, the buccal and palatine tubercles. The cheek protrusion is more pronounced. The bottom of the tooth cavity has a saddle shape and is located much higher than the neck of the tooth, under the gum. Along the edges of the bottom of the tooth cavity, the mouths of the buccal and palatal canals are funnel-shaped. The canals are difficult to pass, but the palatine canal is wider, straight, and the buccal canal is narrower and curved.

In 2-6% of cases, there are three channels: two buccal (anterior and posterior) and

one palatine. The average length is 21mm (19-23mm), has 2 roots and 2 canals in 79% of cases, 1 root and canals in 18%, 3 roots and 3 canals in 3%.

Note: the most common variant of the tooth occurs with two divergent roots up to 60%. A single-root version with one or two canals ending in one apical foramen occurs in 18%. The bottom of the tooth cavity is often significantly lower than the neck. This position does not change with age due to the deposition of secondary dentin.



UPPER FIRST PREMOLAR (left) - VL4

Tooth length: average - 21 mm span 17-26 mm Number of canals 1 -12%, 2-86%, 3-2% Lateral canals 49% Apical deltoid ramifications 3% Apical foramen 0-1 mm from the apex 95% 1-2 mm from apex 55%

The second premolar of the upper jaw. (Fig. 10.) The coronal cavity of this tooth resembles the cavity of the first premolar, is compressed in the anteroposterior direction, has the shape of a slit, elongated in the bucopalatine direction. The arch of the cavity is located at the level of the neck of the tooth. The coronal cavity without a sharp border turns into a straight, well-passable root canal, the mouth of which is located in the center of the cavity. In 24% of cases, the second maxillary premolar often has two canals (buccal and palatal), which can be connected and opened by one or two apical foramina. Average length 22mm in 56% has 1 canal and 1 root, 42% has 2 roots and 2 canals, 2% has 3 roots and 3 canals.

Note: in all manuals, the basic version L5 is presented as a single-rooted and single-canal tooth. However, channel 2 is observed in almost half of the cases. This fact is underestimated and is the cause of serious complications that do not fit into the X-ray picture. According to Ingle et al. (1985) one or two canals terminating in one apical foramen occur in 75% of cases. in other cases, there are separate canals in the tooth. The canal curvature according to the bayonet type is observed in 21%, the distal deviation of the corpus - in 27%, as well as B4 - the low position of the bottom of the pulp chamber.

The first premolar of the lower jaw.(Fig. 11). The coronal cavity of the tooth is oval, narrowed in the anteroposterior direction. There are two depressions in the fornix of the cavity, the larger one corresponds to the larger buccal tubercle, the smaller the lingual one. The largest cavity size is observed below the tooth neck. Gradually narrowing, the tooth cavity turns into one passable canal. There may be two canals (buccal and lingual), which can connect and open with one or two apical foramina. The average length is 22mm (20-24mm), has 1 root and 1 canal in 74% of cases, or 1 root and 2 canals converging at the apex in 26% of cases.

Note: the occlusal surface is sharply inclined lingually due to the weakly expressed lingual tubercle. which can lead to perforation of the buccal surface of the root with a difficult search for the pulp chamber. The buccal horn is well defined. The pulp chamber and the oval canal are compressed in the mesiodistal direction. The curvature of the apical part is most often distal (57%). It should be borne in mind that channels of the IV class according to Weine are quite common. According to Valued (1978), this occurs in 24% of cases. The second premolar of the lower jaw. (Fig. 12.) The coronal cavity of the tooth is rounded. In the fornix of the cavity there are two uniform depressions, respectively, the buccal and lingual tubercles. Gradually narrowing, the cavity of the tooth crown passes into one well-passable canal.

The average length is 22mm (20-24mm), in 97% of cases it has 1 root and 1 canal, in 3% - 1 root and 2 canals.

Note: the pulp chamber and oval root canal are compressed in the mesio-distal direction. The canal is straight, cannot have a 40% bend in the apical third, and / or 10% vestibularly. Apical foramen incl. may be 3 mm from the apex. Given the slight distal inclination of the tooth and the frequent distal curvature of the root, it is necessary to form access cavities with mesial displacement. And in the cavity of the tooth, mouth narrowing is expressed.

Maxillary first molar... (Fig. 13). In the coronal part of the tooth cavity, which repeats the shape of the crown, the arch, the bottom of the cavity and four walls (buccal, palatal, anterior and posterior) are distinguished. On a cross-section, the tooth cavity has the shape of a rhombus. The vault of the cavity is located on the border of the upper and middle third of the crown of the tooth, has depressions corresponding to the masticatory tubercles. The larger depression corresponds to the larger anterior buccal cusp. The bottom of the tooth cavity is slightly convex and is located at the level of the tooth neck or slightly above it, under the gum. At the bottom of the tooth cavity there are three mouths of the root canals of the anterior buccal, posterior buccal and palatal, which, when connected, form a triangle. The

base of the latter is formed by a line connecting the mouths of the buccal canals, and the apex is formed by the palatine. The longest palatine canal is usually straight, well-passable, oval in shape. The buccal canals are narrow curved, usually difficult to tool. Often there is a fourth canal in the anterior buccal root. It usually has a narrow mouth that is difficult to access for instrumentation. In some cases, it is isolated, and sometimes in the area of the tooth apex it merges with the main canal and ends with one apical foramen. Average length 22mm (20-24mm), has 3 roots and 3 canals in 56.5% of cases, 3 roots and 4 canals in 42.5%, 4 roots and 5 canals in 2%. As a rule, the mouth of the fourth canal is located on the line connecting the mouth of the buccal and palatal canals at a distance of 1.5-2 mm from the buccal. Note: The pulp chamber has a triangular rather than rectangular shape, the corners of which form the canal orifices. The bottom is convex. If there is a fourth canal, it is located in the bucco-mesial (AM) root. In 70% of cases, these channels are connected to the apex. The longest palatal canal is straight, but in 55% of cases in the apical third it deviates to the buccal side. The buccal-distal canal (SD) is the shortest and has a distal direction. In the area of trifurcation, additional canals are observed in 18% of cases. The access cavity should be formed in the mesial half of the crown.

The second molar of the upper jaw.(Fig. 14). There are 4 variants of the structure of the tooth cavity, respectively, 4 variants of the anatomical shape of its crown. The most common are the 1st and 4th variants of the structure of the tooth cavity. The 1st variant of the structure of the cavity repeats the shape of the cavity of the first molar of the upper jaw. The 2nd and 3rd options are more rare. The cavity of the teeth in these cases has the shape of a rhombus, elongated in the anteroposterior direction. The canal mouths approach each other and are located almost on one straight line. The arch of the tooth cavity in the 2nd version has four depressions, respectively, four cusps.

The anterior buccal cavity is more pronounced. The arch of the cavity in the 3rd version has three depressions, corresponding to three tubercles, the anterior cheek depression is also the most pronounced. The 4th variant of the structure of the tooth cavity has a triangular shape, corresponding to the three-tubercle of the chewing surface. The arch of the cavity is projected at the level of the neck of the tooth and has three indentations corresponding to the cusps. The anterior buccal cavity is more pronounced. The bottom of the cavity of the tooth of the second molar of the upper jaw is located above the level of the neck of the tooth. There are three root canals: two buccal (anterior and posterior), one palatine. The palatine canal is wide, well passable, the cheeks are narrow, curved, often have lateral openings. Average length 21mm (19-23mm). Typically, a tooth has 3 roots and 3 canals in 65% of cases, 3 roots and 4 canals in 35% of cases.

Note: the cavity of the tooth repeats the above patterns for the first upper molar in a slightly different quantitative ratio. If at the bottom of B6 the canal mouths form an almost isosceles triangle with an apex near the palatine, then at B7 an obtuse triangle is formed. Sometimes in molars with a narrow crown in the mesodistal direction, the canal mouths are located on the same line. There is a uniform curvature of all channels.

The third molar of the upper jaw. The coronal cavity of the tooth is variable in structure, like the tooth itself. Often resembles the shape of the cavity of the tooth of the first or second molar of the upper jaw with three canals (two buccal and one lingual). More than three root canals are possible. Often, the channels merge into one. Due to the structural features and poor access, the third molar presents particular difficulties in endodontic treatment. Average length 18mm (16-20mm). The sizes and shapes of roots and canals are not constant, their number can vary from 1 to 4-6.

The first molar of the lower jaw.(Fig 15). The coronal cavity of this tooth has a vault, a bottom and four walls (buccal, lingual, anterior and posterior). The arch of the cavity is located on the border of the middle and lower third of the crown of the tooth and has five depressions, respectively, five tubercles of the chewing surface. The anterior cheek depression is most pronounced. The bottom of the tooth cavity has a rectangular shape, elongated in the anteroposterior direction, with a convex surface. Located at the level of the neck of the tooth or slightly below. There are three root canal orifices at the bottom of the tooth cavity. There are two canals in the anterior root, and one in the posterior root. The entrance to the anterior buccal canal is located directly under the tubercle of the same name. The entrances to the anterior lingual and posterior canals are located under the longitudinal fissure separating the buccal and lingual tubercles. The mouths of the canals form a triangle with the apex at the mouth of the posterior canal. The anterior canals are narrow, especially the anterior buccal. The posterior canal is wide, well passable. Often a tooth has four canals, two of which are located in the anterior root, and the other two are located in the posterior root. The mouths of the channels in this case form a quadrangle. The average length is 22mm (20-24mm), as a rule, it has 2 roots and 3 canals in 65% of cases, in 29% - 4 canals, in 6% - 2 canals.

Note: the pulp chamber is located in the mesial 2/3 of the crown, has a trapezoidal shape with a wider mesial than distal part. The bottom of the chamber is convex and located below the neck of the tooth. The mouth of the mesio-buccal canal is located under the apex of the corresponding tubercle. The mouth of the mesial-lingual canal is located between the corresponding tubercle and the central occlusal sulcus. The mouth of the distal canal is projected almost at the intersection of the

ocunosional grooves. The square shape of the pulp chamber indicates the need to search for a second distal canal. The mesial canals often (84%) have a distal curvature. The mesio-lingual canal is slightly larger in diameter and straighter than the mesial-buccal canal.

The second molar of the lower jaw.(Fig. 16) The cavity of the tooth resembles the shape of the cavity of the tooth of the first molar of the lower jaw. However, the vault of the cavity has four depressions, respectively, four tubercles on the chewing surface. Compared to the first molar of the lower jaw, the cavity of the tooth is smaller and the distance between the orifices of the root canals is smaller due to the convergence of the anterior and posterior roots. The average length is 21mm (19-23mm), in 13% of cases it has 2 roots and 2 canals, in 77% - 2 roots and 3 canals, in 10% - 2 roots and 4 canals.

Note: all the provisions presented in the notes to H6. also apply to H7. The mouths of the mesial canals H7 can begin from a common slit opening. Both lower molars have a significant lingual inclination with an almost horizontal position of the occlusal surfaces. This sometimes leads to lingual perforation of the tooth.

Mandibular third molar... The cavity of the tooth is variable in structure, repeats the shape of the tooth itself. It often resembles the structure of the tooth cavity of the first or second molar of the lower jaw. However, the number of canals is not constant due to the diversity of the number and location of roots. Roots often grow together to form one canal. Average length 18mm (16-20mm). In most cases, there are 2 roots, but often they merge into one cone-shaped one. However, the size and shape of the roots are not constant.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the

			essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells

			confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactory "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine .	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

6- Practical lesson

Topic: Endo Access. Cavity opening technique.

Training lesson technology (practical lesson)

Time: 120 minutes	*Number of students: 10-12*
Type and form of training session	Practical lesson
Structure of the lesson	1. Introduction. 2. Theoretical part 3.Analytical part: - organizer -Test and Situational Task 4.Practical part
The purpose of the lesson:	- to have an understanding of endo access, the technique of opening the cavity.
The student should know:	- concepts about the features of endo access, the technique of opening the cavity
The student must be able to	-distinguish between the methods of endo access, the technique of opening the cavity.

Tasks of the teacher: - have an idea of the methods of endo access, the technique of opening the cavity Explain the methods of endo access, the technique of opening the cavity	*Learning outcomes*: - has the concept of endo access, the technique of opening the cavity
Teaching methods	Lecture, brainstorming, story, video method, practical lesson, work with a book, dialogue, educational games, pinboard. organizer.
Forms of education	Group work ("Learning Together", "Work Together-Change Ideas"), single
Teaching aids	Board-stand, flipchart, video films, writing board, model, dummies, graph, diagrams, diagram, notes, control sheet, texts.
Study conditions	Specially equipped rooms.
Monitoring evaluation	Oral survey: express test, written survey: test

Questions on the topic:

1. Open the tooth cavity
2. Open the tooth cavity...
3. Technique for opening the dental cavity of the upper molars.
4. Method of opening the dental cavity of the lower molars

Interactive method

Using the "Chamomile" method

A teacher from colored paper cuts out several sheets in the form of chamomile petals and makes questions on this topic. Then, after questioning the student, the teacher gives the opportunity for an additional assessment to select a sheet and answer the question.

Text

For endodontic treatment, an autopsy is performed andcovering the cavity of the tooth.

Everyone knows about the need to open the tooth cavity, however,it is not always lazy. The opening of the cavity of the tooth should provide good access to the mouth

of the canals and the absence of overhangs over them. In this case, the doctor is required to have a good knowledge of the topography of the tooth cavity, possible variations in the number of roots and canals.

The second place in terms of error rate belongs to the quality of the opening of the tooth cavity in molarc, which is reflected in the preservation of the canal overhangs.

This is especially common in lower jaw molars.sti, the buccal canal in which is significantly mixed to the vestibular (buccal) surface. The presence of a canopy over the mouth of the canal makes it "impassable," or conditions are created for the instrument to break off in the canal (due to its curvature) during the passage.

Access to the orifices of the root canals is ensuredexactly wide opening of the tooth cavity. This stage involves:

1. Formation of the tooth cavity, taking into account its anatomical features - size, shape, quantity, location and curvature of root canals.

2. Providing the shape of the cavity necessary for the convenience of the postgoing manipulations and providing for:

a) open access to the mouths of the canals;

b) if possible - a direct approach to the apical foramen;

c) formation for the applied filling technique;

d) the possibility of complete control over the direction expanding tools.

3. Removal of the remaining carious dentin and remnants of re- stavration.

4. Toilet cavity.

Trepanning of the tooth crown is carried out in accordance with the topographic anatomy known for this tooth and confirmed by a diagnostic radiograph. Trepanation of the upperanterior teeth usually start from the oral surface. When opening the cavity of the lower incisors, often two-channel, to find the mouth of the vestibular canal, it is often necessary to partially remove the cutting edge. Trepanning of premolars is performed in the middle of the crown, molars - in the mesial part of the chewing surface. At this stage, conventional burs (fissure with a rounded tip or inverse taper) are used, fixed in a high-speed handpiece. Before trepanation and during its process, it is necessary to palpate the alveolar process in the area of the tooth root in order to navigate the location of the root and the direction of its canal.

After opening the tooth cavity or in the presence of its communication with the root

cavity, for full disclosure of the pulp chamber, it is necessaryuse endobor. When forming a cavity, it is undesirable to use a round bur, when working with which it is difficult to clearly determine the direction of its movement.

The cavity of the tooth is considered to be correctly opened and formednoisy, if a smooth transition into it of the walls of the carious cavity or trepanation hole is ensured and free access to the orifices of all root canals is open.

Endodontics can be used to toilet the tooth cavity.excavators, which differ from the usual ones in the large length of the working part.

The search for the orifices is carried out using hand-held endodonticsof various forms of microscopic probes. If it is difficult to find the canal mouths, you can use the methods of transillumination, staining, or the introduction of sodium hypochlorite.

Transillumination is carried out from the side of the lingual orthe buccal wall of the tooth. With sufficient light transmission, the canal orifice bones can be contoured in the form of dark dots.

When staining, special indicators are usedthe mouths of root canals, or indicators of caries, similar to the first in chemical composition. In the absence of both, liquid plaque indicators can be used. After the dye is introduced into the tooth cavity and washed off, the indicator is retained in the canal orifices in the form of dots of the corresponding color.

Sodium hypochlorite is slightly warmed up and injected into thetooth lobe. Within a few minutes, violent gas evolution occurs, after which the liquid becomes transparent and upon close examination, the formation of tiny bubbles at each mouth of the channel can be detected.

If it is difficult to find the mouth of the canal even with a very deeppreparation (which happens during obliteration of the tooth cavity and canal orifices), to prevent perforation and to confirm the correct direction of the bur, X-ray can be performed by removing the bur from the tip and fixing it with cotton balls in the cavity in the position in which it was during preparation ...

Removal of soft tissues from the canal is performed using a pulpoextractor. The instrument should only be inserted in the straight part of the canal and no deeper than 2/3 of the canal length.

Open the tooth cavity - create a dotted message kari- cavity and cavity of the tooth or to form access to the cavity of the tooth at one point. The progression of the carious process can lead to the opening of the tooth cavity. The communication of the carious cavity with the tooth cavity can be determined by probing.

Open the tooth cavity- remove the arch of the tooth cavity for coroot canal access

buildings. In this case, the tooth cavity cannot be expanded and deformed, but the walls and the bottom of the tooth cavity must be sufficiently visible.

Opening and opening of the tooth cavity of each group of teethhave their own characteristics. Most often, these manipulations are performed through the carious cavity. But sometimes it becomes necessary to trepan the crowns of intact teeth. The carious cavity is prepared according to all requirements. The cavity of the tooth is opened with a spherical bur No. 1 or a thin tip of a probe. In this case, there is a feeling of "falling" into the cavity of the tooth.

In the incisors and canines in the presence of carious cavities on the contact surfaces (classes III and IV), they are transferred to the palatine or tonguennuyu surface, and then open the cavity of the tooth. In the presence of a carious cavity in the cervical region or in intact teeth, the tooth cavity is opened from the palatal or lingual surface. Trepanning of the tooth crown is performed using a turbine drill with a diamond or carbide bur. The crown is trepanned in the center of the middle third of its surface. It is unacceptable to trephine the incisors from the incisal edge, which can lead to a break of the vestibular and lingual walls. Trepanation of the intact crowns of the lateral incisors of the upper jaw is performed from the palatal surface in the region of the blind fossa (fovea caecum). When opening the tooth cavity, the direction of the bur is perpendicular to the palatal or lingual surface. Then, when opening the tooth cavity, the direction of the bur is changed to a direction parallel to the axis of the tooth.

In the premolars of the upper jaw, opening the tooth cavity produced in the area of the bottom of the carious cavity, located closer to the pulp. In this case, class II carious cavities are transferred to the chewing surface. In an intact tooth and in the presence of a class V carious cavity, the crown of the tooth is trepanned in the middle of the fissure, directing the bur to a more pronounced tubercle. The opening of the tooth cavity is carried out in the buccal-palatal direction according to the location of the canal orifices. The location of the bottom of the tooth cavity, which is located above the neck of the tooth, under the gum, is also taken into account. Knowing this is important, since they often create two holes in the fornix of the tooth cavity and take them for the mouths of the canals. It is wrong to open the tooth cavity in the anteroposterior direction. This often leads to perforation of the contact walls of the tooth.

The second premolar of the upper jaw often has one canal. The opening of the tooth cavity is performed in the sein the middle of the fissure, and the opening is in the buccal-palatal direction.

Opening of the tooth in the premolars of the lower jaw if present carious cavities are produced by analogy with the premolars of the upper jaw.

When opening the tooth cavity in the intact first premolar of the lower jaw, the structure of the occlusal surface is taken into account.The occlusal surface of the first premolar has two cusps connected by a roller, on the sides of which there are two transverse fissures (anterior and posterior). Therefore, the opening of the tooth cavity is performed in the middle of the anterior fissure, directing the bur closer to the buccal tubercle. When opening the tooth cavity, the inclination of the crown to the lingual side with respect to the root is taken into account. Ignoring this point can contribute to the perforation of the lingual wall. The cavity of the tooth in the premolars of the lower jaw has a rounded shape.

In the second premolars of the lower jaw, on the occlusal surface there are two tubercles of the same height, dividedwith a furrow. Opening and opening of the tooth cavity is performed in the middle of the groove. The open tooth cavity has an oval, rounded shape.

The principle of opening the tooth cavity in the upper and lower molars**her jaws** at the presence of a carious cavity is the same as in the premolars.

Opening of the tooth cavity of the first molar of the upper jaw intact

the front tooth is made in the anterior fissure towards the anterior buccal tubercle, if possible without affecting the roller connecting the anterior palatine and posterior buccal tubercles. When meaningAfter the deposition of replacement dentin in the tooth cavity, it can be opened towards the widest palatine canal. The opening of the tooth cavity is performed in the buccal-palatal direction of the bur, respectively, to the buccal and palatal orifices of the canals.

The greatest difficulties arise when opening and revealing the sexspines of the teeth of the second and third molars of the upper jaw. It should be remembered about four variants of the structure of the crowns of the second molars, which in some cases are extended in the anteroposterior direction by analogy with the tubercles.

Opening of the tooth cavity of intact lower molars is performedin the middle third of the longitudinal fissure towards the anterior buccal tubercle. When obliterating the tooth cavity, opening it can be performed in the direction of the posterior canal. The opening of the tooth cavity of the lower molars is performed in the anteroposterior direction. Opening the tooth cavity in the bucco-lingual direction is an error.

DETECTION OF CHANNEL ORHES

This stage is important not so much in terms of the effectiveness of treatment, as in creating convenience in work during the passage and filling of the canals. Buccal canals in

the upper and anterior in the lowertheir molars depart in the form of thin branches, and their search presents significant difficulties. Once they have expanded into funnel-shaped depressions, entry into the canal is greatly facilitated. The widening of the canal mouth can be done with a ball-shaped bur, however, there are special tools of various diameters with a shortened working part - Gates Glidden, and which are used to widen the canal openings. The expansion of the channel mouths is carried out when operating at low machine speeds.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an

			accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactory "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine .	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

7-Practical lesson

Topic: Methods for determining the working length of canals.
Training lesson technology (practical lesson)

Time: 120 minutes	*Number of students: 10-12*
Type and form of training session	Practical lesson
Structure of the lesson	1. Introduction. 2. Theoretical part 3.Analytical part: - organizer -Test and Situational Task 4.Practical part
The purpose of the lesson:	- have an idea of the working length of the canals, methods for determining the working length of the canals.
The student should know:	- concepts about the features of the methods for determining the working length of the channels.
The student must be able to	-distinguish the working length of the canals.
Tasks of the teacher: - have an idea of the working length of the canals, methods for determining the working length of the canals Explain the working length of the canals, methods for determining the working length of the canals	*Learning outcomes*: - has the concept of measuring the working length of the tooth.
Teaching methods	Lecture, brainstorming, story, video method, practical lesson, work with a book, dialogue, educational games, pinboard. organizer.
Forms of education	Group work ("Learning Together", "Work Together-Change Ideas"), single
Teaching aids	Board-stand, flipchart, video films, writing board, model, dummies, graph, diagrams, diagram, notes, control sheet, texts.
Study conditions	Specially equipped rooms.
Monitoring evaluation	Oral survey: express test, written survey: test

Questions on the topic:

1. Working tooth length
2. Are there any methods for determining the working length of a tooth?
3. Electrometric method

Tests:

The main methods of examining a patient include:

Patient questioning *

X-ray examination

Thermal diagnostics

Biochemical research

Microbiological examination

The main survey methods include:

Patient examination *

Electroodontodiagnostics

Cytological examination

Biochemical research

Histamine test

The main research methods include:

Teeth probing *

Histological examination

Electroodontodiagnostics

Allergic research methods

Thermal diagnostics

The main survey methods include:

Percussion of teeth *

Immunological research

Electrometric research

Blood test

Analysis of urine

The main survey methods include:

Palpation of soft tissue surrounding the tooth *

Cytological examination

Electroodontodiagnostics

Histamine test

Biochemical research

Additional survey methods include:

X-ray examination *

Taking anamnesis

Patient questioning

Percussion of teeth

Probing teeth

Additional survey methods include:

Electroodontodiagnostics *

Percussion

Sounding

Palpation

Inspection

Additional survey methods include:

All answers are correct *

Biochemical research

Immunological studies

Cytological studies

Blood test

Determine the name of the research method in which a beam of light is directed to the cleaned surface of the tooth. The results of the study make it possible to judge the state of the hard tissues of the tooth.

Luminescent diagnostics *

Electroodontodiagnostics

Thermometry

X-ray

Enamel staining

To determine the electrical excitability of a tooth, the following method is used:

Electroodontodiagnostics *

X-ray

Cytological

Biochemical

Thermal diagnostics

The height of the dental office must be at least:

3m *

2m

2m 80 cm

4 m

2m 60 cm

The main document in the dental office is:

Form 043 / y *

Order number 600

Order No. 527

Order number 462

Order number 575

The main document in the dental office is:

Form 39-stom. *

Order No. 480

Order number 570

Order number 462

Order number 560

The following are sterilized by chemical (cold) sterilization:

Dental mirror *

Tweezers

Excavator

Ironer

Corkscrew

The following are sterilized by chemical (cold) sterilization:

Plastic spatula *

Dental probe

Curette

Metal spatula

Ironer

The following are sterilized by chemical (cold) sterilization:

Scissors *

Tweezers

Probe

Corkscrew

Ironer

Sterilized by autoclaving:

All answers are correct *

Dental burs

Tweezers

Probe

Ironer

Sterilized by autoclaving:

All answers are correct *

Corkscrew

Excavator

Cotton rolls

Cotton swabs

Sterilized by autoclaving:

All answers are correct *

Gauze

Bed sheets

Scissors

Scalpel

Sterilized by autoclaving:

All answers are correct *

Plastic spatula

Dental probe

Curette

Metal spatula

Interactive method

USE OF THE "DARK SHAPE" METHOD:

To play the game you need:

1. Variants of questions printed on sheets (10 variants).
2. Numbers according to the number of question options (10).
3. Numbers for drawing lots for students.

Game progress:

1. The group is divided by lot into 2 subgroups of 5-6 students each.
2. From each subgroup, one student approaches the teacher, chooses the number of the question option and receives a protocol sheet.
3. In each subgroup, the date, group number and full name are recorded on the protocol sheet. students of the subgroup, the name of the game, the topic of the lesson.
4. Students are given 5 minutes to discuss questions, then they start the competition.
5. Out of 2 subgroups - 1 asks a question, the second answers.
6. In the subgroup asking questions, 3 consultants are selected: 1-asks questions, 2-marks the number of correct answers on the sheet, 3-keeps track of the time.
7. The responding subgroup within 10 minutes. should answer as many questions as possible as quickly as possible.
8. The teacher monitors the correctness of the answers.
9. Each correct answer is worth 0.1 point. According to the number of correct answers, the entire subgroup receives the same number of points.
10. Then the students of the 2nd subgroup begin to ask questions of their version to the students of the 1st subgroup.
11. At the end of the competition, the results are summed up and within 15 minutes. issues are discussed.
12. The score received by students is taken into account when setting the current rating of the lesson.
13. In the group's journal, a record is made about the conduct of this business game in the lower free part of the sheet with the signature of the head of the group.

The game protocols are saved by the group teacher

Text

Working length of the tooth - distance from the apical foramen to the most convex part of the ladybird. There are three methods for determining the working length of a tooth:

• estimated length of the tooth and root;

• X-ray;

• electrometric.

Numerous measurements made it possible to establish the average data for the length of the tooth and root, as well as the minimum and maximum minimal deviations.

The results are shown in Table 2.

*table 2***The length of the teeth and roots, depending on their gruppova accessories.**

Средняя длина корня, мм.	Средняя длина зуба, мм.	Формула зубов	Средняя длина зуба, мм.	Средняя длина корня, мм.
Нижняя челюсть			Верхняя челюсть	
12	21 (19-23)	1	25 (22,5-27,5)	13,3
13,4	22 (20-24)	2	23 (21-25)	12,9
14,9	26 (23,5-28,5)	3	27 (24-29,7)	16,1
14,7	22 (20-24)	4	21 (19-23)	14
15,6	22 (20-24)	5	22 (20-24)	14,6
14,8	22 (20-24)	6	22 (20-24)	14,5
14,3	21 (19-23)	7	21 (19-23)	13,8
14	19 (16-20)	8	18 (16-20)	13,5

Given that it is difficult to measure the length of the root, they measure the length of the tooth. This is done in the following way, a rubber stopper is put on the endodontic instrument and set to the value corresponding to the calculated length of the tooth to be processed (average length). If, after inserting the instrument into the canal, the rubber stopper reaches the incisal edge or occlusal surface, then the end of the instrument is within the apical opening.

X-RAY DETERMINATION ROOT CANAL LENGTHS

Root canal preparation should be carried out beforekhushki root. The anatomical apex is the root point farthest from the incisal edge or occlusal surface. The X-ray apex is the farthest root point on the X-ray. The X-ray apex may not match the anatomical apex. The apical foramen of the root apex, where the pulp connects to the periodontium. The apical constriction is located just above the apical foramen (closer to the crown) and is the narrowest part of the root canal (Sman, 1993).

Accurate determination of the working length of the root canal andIt is one of the most important steps in endodontic treatment and plays an important role in its success. The working length can be determined on a radiograph, tactilely with a tool or with electronic devices. Blood or exudate on a paper point while drying the root canal can also help in determining the working length. Blood at the tip of the nail indicates excessive enlargement of the apical foramen and protrusion of the instrument beyond the apex, while blood on the lateral surfaces of the nail indicates the presence of a slit lateral perforation (Beer, 1995).

Since the apical constriction cannot be determined on radiographs, the length of the tooth is measured as the distance between the crownsrelative point and X-ray apex. To do this, a radiopaque instrument is inserted into the root canal. An X-ray with a steel file # 15 inserted into the root canal also provides information on the anatomy and number of canals and the direction of their bends. To determine the working length, it is important to determine the relative coronal point. Since the images of the channels can be superimposed on each other on the X-ray, an H-file is inserted into one channel, and a K-file into the other. Alternatively, a second eccentric image can be taken by guiding the X-ray tube more distally or medially. The length of the root canal may change slightly during treatment due to the smoothing of its curvature, therefore, a second exposure may be required to determine the working length.

The X-ray method for determining root length and root canal patency is the most reliable. X-ray with endodontic inserted into the teeth canalsinstruments allows you to determine the degree of passage of the root canal, the direction of movement of the instrument, the presence of perforation, curvature, degree of filling, etc. However, this method is contraindicated in pregnant women, persons exposed to radiation, including after X-ray therapy, children. Its repeated use is also undesirable. All this limits the use of X-ray control. In addition, the possibility of the absence of an X-ray room should be taken into account.

DIFFICULTIES IN DETERMINING LENGTH ROOT CANALS

Tooth length is the distance from the conditional crown pointto the anatomical apex, while the working length is measured between the relative coronal point and the apical constriction. However, clinically, apical constriction cannot be accurately determined. The putative location of the root canal termination point was derived from the study by Kuttler (1955), who determined that the mean distance between the apical constriction and the center of the apical foramen was 0.52 mm. Therefore, root canal treatment should be completed before 0.5 mm to the radiographic apex (Voss, 1993).

This randomly chosen endpoint should protect the apical foramen from over-expansion and prevent bacteria from pushing into the periapical tissues. Ho, if the canal is processed to this point, most of the critical zone, which contains a sufficient number of bacteria for the development of periapical inflammation, remains intact (the critical zone occupies 3 mm of the root canal from its apex). Therefore, in order to completely eliminate all bacteria and their waste products, it is necessary to process the canal up to the X-ray point (Simon, 1993).

The X-ray apex is the only point whereThis can be used for measurements. It is not possible to accurately measure the distance between the apex and the constriction. Van de Voorde and Bjarndahl (1969) found that, on average, the distance from the anatomical apex to the apical constriction is 1.1 mm, and to the apical foramen is 0.3 mm. Working length was determined with absolute accuracy in 75% of cases (Negm, 1983). In 45% of cases, when the tip of the instrument did not reach the radiographic apex slightly on the radiograph, it actually went beyond the apical foramen (Chunnetal, 1981).

By visual assessment after surgical opening onlyto 30% of the instruments inserted into the canal to determine its length were in the correct position (Kollmann, 1985). In 1/4 of cases, endodontic treatment that seemed correct on radiographs was found to be inadequate after tooth extraction and examination (Kersten et al., 1987). Determination of the working length using a radiograph is not directly possible due to distortions of the projection technique. The orthoradial projection improves the accuracy of working length by 7% (Rocke, 1993).

ELECTROMETRIC LENGTH MEASUREMENT ROOT CANALS

Nowadays, electronic devices are widely used.trometric method for determining the degree of passage of the channel and its length. The principle of determination is based on measuring the electrical resistance of the soft tissues of the oral cavity and tooth tissues. The principle of determining the length of the root canal electronically

is to measure the absolute resistance or the resistance range. However, it is not possible to directly measure the tissue impedance between the apex and mucosa. If, during the measurement, the root canal is dry throughout, the circuit closes on the periapical tissues. If the root canal is wet and contains residual pulp, the required resistance value will be obtained before the instrument reaches the apex (Voss, 1988). The degree of error depends on the channel diameter.

When comparing the data of electronic and radiological measurements of the length of the root canals, significante differences. On radiographs, the length of the root canal was correctly determined in 83.5% of cases, and with an electronic device in 73.1% of cases (Hembrough et al., 1993). If the channels are well dried, the accuracy of electronic measurements varies within 67-90%, if the channels are filled with ethanol - 50-72%, depending on the type of apparatus used. When filling the canals with sodium hypochlorite, accurate values can be obtained in 37-73% of cases (Fuad et al., 1993).

Even the latest devices, which register the change in impedance when the instrument is removed from the channel, are not able tolocalize the apical constriction in person. The position of the apical constriction can only be determined by measuring the impedance profile. However, modern endometric technologies do not yet allow this to be done. Thus, the position of the instrument in the canal can only be determined with an x-ray (Voss, 1993).

Due to the fact that the resistance of the tooth tissues is slightly higher, than the mucous membrane of the mouth, the fixation of one element in the palate, and the second in the root canal of the tooth does not cause the circuit to close, and the signal (sound or light) does not occur. If the electrode, placed in the canal, reaches the apex of the tooth, then the circuit is closed and a sound or light signal appears.

The firm "Parkell" produces the apparatus "Pharmatron IV" - electronny apex - a locator that allows you to determine the degree of passage of the canal indicating on the light board the distance (in fractions of a millimeter) between the tip of the instrument inserted into the canal and the apical opening. If the instrument reaches the apical foramen, it is accompanied by a decrease in resistance, then this is recorded by the electrical circuit and is issued in the form of a sound and light signal (“O” is highlighted). If the instrument goes beyond the apex hole, the letter “E” is displayed on the display, the yellow light comes on and a sound signal sounds.

LOSS OF WORKING LENGTH

During instrumentation, a blockage of the root canal may occur due to the

accumulation of dentinchips and pulp residues or the formation of an apical step due to the accumulation of hard and soft tissue fragments. As a result, the smooth passage of the tool to the top becomes impossible. This blockage can be prevented if you constantly monitor the position of the stopper on the instrument, which determines the depth of its insertion, and carefully work in the root canal.

The accumulation of pulp residues in the canal can be avoided by carefulafter extirpation of the pulp. After cleaning the orifice of the root canal, it is passed through the entire length of the size 15 H-file, removing the pulp with rotary movements. Clinical experience has shown that the use of RC-Prep at this stage thinns the pulp and breaks down collagen fibers. Washing the canal at this stage will not give the desired results, since the irrigation solution will not be able to penetrate deeply into the canal and dissolve the tissues (Baumgartner, Mader, 1987).

The accumulation of pulp residues can only be removed bythe power of a size 15 H-file, moistened with lubricant, which is introduced into the canal with gentle rotational movements. After each removal from the canal, the file must be thoroughly cleaned and disinfected. When blocking the instrument in the canal, it is contraindicated to inject it with force. Also, the demineralizing agent should not be left in the canal as a temporary dressing. Dentine chips can be removed from the canal with rotating K-files or the Canal Master System (Beer, 1993). In thin channels, rotating Ni-Ti instruments can be used to overcome obstacles without losing the tactile sensation. Treatment of the coronal part of the canal with a Gates-gidden bur and frequent rinsing avoid blockage of the canal. Some obstacles can only be traversed with a pre-curved H-file (West et al., 1994).

WORKING LENGTH AT APICAL RESORPTION

Chronic apical periodontitis is histologically characterized by four main features:inflammatory infiltration mainly by plasma cells and lymphocytes, granulation tissue with fibroblasts and branching capillaries, cords of proliferating stratified epithelium and a connective tissue capsule (Schroeder, 1991). At the same time, bacteria limited by the neutrophilic shaft are found in the apical part of the canal. Bacteria leave the canal through the apical foramen into the periapical tissues only during exacerbation of the process (Nair, 1987). The surrounding periapical bone contains osteoclasts. At the root apex in the area of chronic inflammation, there are signs of cement and dentin resorption. At the same time, extensive areas of resorption are found along the root canal wall, not only in the apical part, but throughout the entire length.

With chronic periodontitis, not only reZorption of the root with widening of the apical part of the canal and apical narrowing, but also the deposition of cement (Delzan-gles, 1988).

In most root canals with periapical foci of destruction, as a rule, apical narrowing and dentin-cement connection are not found, therefore, during treatment of such canals it is necessary to form an “apical support”. It should be positioned as close to the apical foramen as possible so that all debris and bacteria in this area can be removed during canal treatment. With the described X-ray picture, treatment of the canal, not reaching 0.5-1.5 mm to the apex, does not meet the main goal of endodontic treatment - complete cleaning of the infected apical region (Siman, 1993).

The apical stop helps prevent the instrument from escaping.cops and filling material for the apex of the root. Instruments that extend beyond the apex during canal treatment can exacerbate inflammation, aggravate bone and root resorption, or support the development of a chronic inflammatory process (Seltzer et al., 1973). The formation of an “apical stop” with dentin chips (dentinoplasty) gave good histological results in almost all cases (Tronstad, 1978).

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows,

			tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactory "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
in	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.

e.			
en.	54 and below	Unsatisfied. "2"	Has no exact idea. Does not know.

8- Practical lesson

Theme: Apical-coronary and coronary-apical methods of canal enlargement

Training lesson technology (practical lesson)

Time: 120 minutes	*Number of students: 10-12*
Type and form of training session	Practical lesson
Structure of the lesson	1. Introduction. 2. Theoretical part 3.Analytical part: - organizer -Test and Situational Task 4.Practical part
The purpose of the lesson:	- have an understanding of the apical-coronary canal dilation method.
The student should know:	- concepts about the features of apical-coronary canal dilation methods
The student must be able to	-. channel expansion with method **STEP BASK**
Tasks of the teacher: - have an understanding of the methods of apical-coronary canal dilatation Explain the methods of apical-coronary canal dilatation	*Learning outcomes*: - has concepts of methods of apical-coronary canal dilatation.
Teaching methods	Lecture, brainstorming, story, video method, practical lesson, work with a book, dialogue, educational games, pinboard. organizer.
Forms of education	Group work ("Learning Together", "Work Together-Change Ideas"), single

Teaching aids	Board-stand, flipchart, video films, writing board, model, dummies, graph, diagrams, diagram, notes, control sheet, texts.
Study conditions	Specially equipped rooms.
Monitoring evaluation	Oral survey: express test, written survey: test

Questions on the topic:

1.Methodics of instrumental processing of canals.
2.Chemical method of expanding root canals.
3.Medicated root canal treatment

Interactive method

USING THE HANDLE IN THE MIDDLE TABLE METHOD

All students of the group are divided by lot into 3 subgroups of 3 students each. Each subgroup sits down at a separate table, prepares a blank sheet of paper and a pen. The date, group number, last name and first name of the student are written on the sheet. The task is offered, to answer one question for the whole subgroup. Each student writes down his last name and one answer option on a sheet and passes the sheet to a neighbor, and moves his pen to the middle of the table. The teacher supervises the work of the group and everyone's participation in it. The general correct version is written down in a notebook. Students who gave the correct answer options receive the maximum score - 100% of the theoretical part rating - 0.8b. Second place students - 85.9% of the rating. Third place - 70.9% of the rating. Those who did not answer or answered incorrectly 30% of the rating. The resulting score is taken into account when assigning marks for the current lesson. The works of students are saved by the teacher.

Text

CHANNEL EXPANSION TECHNIQUE FROM LESS SIZE TO LARGE - STEP BASK

Conventionally, the process of expanding the root canal can bedivided into three stages: processing of the coronal (orifices) (3-5 mm), central and apical (apical) (2-3 mm.) parts. To open the orifice of the root canal, Glidden Qates, Larqo are used, which create a funnel-shaped expansion. If they are not available, for this purpose, you can use a ball-shaped bur No. 3 with a long handle.

The expansion of the central part of the canal is carried out according to a certain scheme. The process is started with a Kerr drill (K-file) of the same size as the drill (K-

reamer) with which the passage was completed. The rubber stopper is pre-set to this length. Suppose that the length of the tooth is 20 mm, and the thickness of the used drill is 015. Then take the drill of the following sizepa - 020 and the channel is processed to the same length - 20 mm. Movement should be like winding a watch, without much stress. After that, they return to the initial 015 thickness. After wetting the canal with EDTA, the canal is treated with a 025 drill to its original length. After removing the drill, and with it the dentin sawdust, they return to the 020 instrument, which eliminates the blockage of the apical opening with dentin sawdust. The root canal is finished with file 025 at a depth of 20 mm.

After that, the technique changes somewhat: on file 030put a rubber stopper at 17-18 mm and treat the canal with preliminary administration of EDTA and rinsing the canal. Then, returning to size 025, the channel is machined to a depth of 20 mm.

The next file is 035, with a rubber stopper at a length of 15-16mm, the canal is processed and again with a drill 025 they pass to a depth of 20 mm. Subsequently, the canal is processed with file 040 and returned to size 025 to a depth of 20 mm. This is how the canal is processed to the required size of the instrument - 050 - 060, while maintaining the size of the apical part of the canal - 0.25.

As a result of this technique, the walls of the root canal acquired a stepped shape. For leveling the walls of the channelare processed with a Headstrom file or a rasp, which allows you to create a cone-shaped funnel shape from the mouth to the top. In the process of work, dentine sawdust is removed from the canal with EDTA solution, 3-3.5% sodium hydrochlorite solution or 3% hydrogen peroxide solution.

Special attention should be paid to working with the Hedstrom file.It is a very effective and reliable tool when used correctly. Movement when using it should be scraping from the top to the mouth of the canal. After rotation by half a turn or a turn, the tool is brought back, while removing the unevenness of the walls. When using these instruments, it is very important to constantly wash out the dentin chips.

Opening of the apical foramen. This is the final stage of the channel expansion work. First of all, it should be noted that notwe bypass this stage in the presence of destructive changes in the bone tissue at the apex of the root. The opening of the root apex is done only by hand. For this purpose it is best to use a drill or auger of size 008 - 010. The rubber stopper is set at 1.5-2.0 mm. more than the working length of the tooth, at which the canal was expanded. EDTA is injected into the canal without fail. After that, rotary movements are made by the reamer with minimal pressure.

Upon reaching the rubber stopper of the incisal edge or occlusal surface of the tooth, which indicates the passagechannel, electrometric or X-ray control is performed. The expansion of the apical opening is carried out strictly observing the condition of

increasing the diameter: 008, 010, 015, 020, 025. You can stop at this size, since it allows you to carry out a reliable filling. In severe cases, you have to resort to a drill.

Strict adherence to the sequence of channel processing, practically andeliminates complications in the form of tool breakage and perforation.

CHANNEL EXPANSION TECHNIQUE FROM BOLSHOGO SIZE TO LESS "CROWN DOWN"

In the literature, this method is covered in different ways - for example, the method of expanding the canal "from the crown down" (from the mouth of the canalto its top) "Crown Down" with a sequential change of instruments from larger to smaller, stated by S.V. Borovsky, N.S. Zhonova in the manual for doctors “Endodontic treatment” - 1997. Success is associated with the development of a more flexible instrument with a non-aggressive tip and the use of an endodontic tip. Maillefer ProFile 04 instruments allow you to taper the root canal to the desired size.

Methodology. Usually start with tool 025 and 030, whichThe rye is inserted into the root canal approximately 1/2 of its length. Then, with the profile of the next size (035, 040), it is brought to the level of the first processing, completing the processing of the coronal part. In the process of changing the instrument to a larger diameter, the contents of the canals are removed by rinsing it out of the endodontic syringe with sodium hypochlorite solution, etc. In addition, during treatment, chemical expansion drugs (EDTA, Kanal-des, Kanal +, Axiprem, etc.) are introduced into the canal. After that, profile 025 is used to process the channel by 2/3 and 3/4 of the length. At this stage, an X-ray is taken to determine the direction of the canal expansion, as well as to determine the working length of the root. After that, changing the size of the profile to a smaller one (015), they reach the physiological apex (narrowing of the canal) and measure the length of the tooth in millimeters, which is recorded in the card of the outpatient. Then,

Aligning the channel walls, if necessary, performwoodpeckers with the help of the Hedström auger.

The opening of the apical foramen is performed if by thisThere are readings, either manually or using an ultrasonic drill and an appropriate apparatus.

In the tutorial "Practical endodontics instrumentyou, materials and methods "- L.A. Khomenko, N.V. Bidenko (2007) describe the following processing technique.

The mouth of the canal is filled with sodium hypochlorite, after which the "npe-Gateg-preparation" is carried out, the file 35 is introduced into the canal untilthe stop and its length are fixed. It is considered optimal to work with a tool of this size to a depth of

16 mm. If it is impossible to enter a file of this size, enter a smaller one. The file is processed until it moves freely in the channel for a fixed length. Only the tip of the tool works, so the tool can be rotated two turns without pressure. Then, for the same length, processing is carried out with Gate-Glidden burs No. 1 and No. 2 (up to bur size 80). After that, the file 30 is inserted into the canal until it stops, its length is fixed, and the canal section is developed. Then, processing is carried out to an achievable (up to a level) length with a file of 25 and then with a smaller one - until the working length of the canal is reached. Before reaching the expected working length (for 3 mm), its exact determination is carried out. After passing the channel to the entire working length, the operation is repeated, but starting with an instrument of size not 30, but 40. In this case, the apical part will be expanded to a larger size. The procedure is repeated again with file 50 and so on until the apical part is developed to size 25. The walls are aligned with the H-file 30-35. Approximate sequence of work with tools of different sizes 35 (to the stop, optimally - 16mm) - 30 (to the stop) - 25 (to the stop) - 20 (to the stop) - 15 (to the stop). If we assume that the tool of size 15 has reached the working length, then the further sequence of work: 40 (to the stop) - 35 (to the stop) - 30 (to the stop) - 25 (to the stop). If tool 25 reaches its full working length, tooling can be stopped, if not, it can be repeated again from size 50 (L.A. Mamedova, V.N. Olesova, 2002). In this case, the apical part will be expanded to a larger size. The procedure is repeated again with file 50 and so on until the apical part is developed to size 25. The walls are aligned with the H-file 30-35. Approximate sequence of work with tools of different sizes 35 (to the stop, optimally - 16mm) - 30 (to the stop) - 25 (to the stop) - 20 (to the stop) - 15 (to the stop). If we assume that the tool of size 15 has reached the working length, then the further sequence of work: 40 (until it stops) - 35 (until it stops) - 30 (until it stops) - 25 (until it stops). If tool 25 reaches its full working length, tooling can be stopped, if not, it can be repeated again from size 50. (L.A. Mamedova, V.N. Olesova, 2002). In this case, the apical part will be expanded to a larger size. The procedure is repeated again with file 50 and so on until the apical part is developed to size 25. The walls are aligned with the H-file 30-35. Approximate sequence of work with tools of different sizes 35 (to the stop, optimally - 16mm) - 30 (to the stop) - 25 (to the stop) - 20 (to the stop) - 15 (to the stop). If we assume that the tool of size 15 has reached the working length, then the further sequence of work: 40 (until it stops) - 35 (until it stops) - 30 (until it stops) - 25 (until it stops). If tool 25 reaches its full working length, tooling can be stopped, if not, it can be repeated again from size 50 (L.A. Mamedova, V.N. Olesova, 2002). The walls are leveled with an H-file 30-35. Approximate sequence of work with tools

of different sizes 35 (to the stop, optimally - 16mm) - 30 (to the stop) - 25 (to the stop) - 20 (to the stop) - 15 (to the stop). If we assume that the tool of size 15 has reached the working length, then the further sequence of work: 40 (until it stops) - 35 (until it stops) - 30 (until it stops) - 25 (until it stops). If tool 25 reaches its full working length, tooling can be stopped, if not, it can be repeated again from size 50 (L.A. Mamedova, V.N. Olesova, 2002). The walls are leveled with an H-file 30-35. Approximate sequence of work with tools of different sizes 35 (to the stop, optimally - 16mm) - 30 (to the stop) - 25 (to the stop) - 20 (to the stop) - 15 (to the stop). If we assume that the tool of size 15 has reached the working length, then the further sequence of work: 40 (until it stops) - 35 (until it stops) - 30 (until it stops) - 25 (until it stops). If tool 25 reaches its full working length, tooling can be stopped, if not, it can be repeated again from size 50 (L.A. Mamedova, V.N. Olesova, 2002). 40 (all the way) - 35 (all the way) - 30 (all the way) - 25 (all the way). If tool 25 reaches its full working length, tooling can be stopped, if not, it can be repeated again from size 50 (L.A. Mamedova, V.N. Olesova, 2002). 40 (all the way) - 35 (all the way) - 30 (all the way) - 25 (all the way). If tool 25 reaches its full working length, tooling can be stopped, if not, it can be repeated again from size 50 (L.A. Mamedova, V.N. Olesova, 2002).

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently.

			Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactory "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.

ine.	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory 2 "	Has no exact idea. Does not know.

9- Practical lesson

Topic: Types of antiseptics, their mechanism of action. Drug treatment of canals.

Training lesson technology (practical lesson)

Time: 120 minutes	*Number of students: 10-12*
Type and form of training session	Practical lesson
Structure of the lesson	1. Introduction. 2. Theoretical part 3.Analytical part: - organizer -Test and Situational Task 4.Practical part
The purpose of the lesson:	- have an idea of the types of antiseptics, their mechanism of action, drug treatment.
The student should know:	- concepts about the peculiarities of the types of antiseptics, the mechanism of their action., drug treatment
The student must be able to	- to distinguish between antiseptics, their mechanism of action, drug treatment.
Tasks of the teacher: - have an idea of the types of antiseptics, the mechanism of their action., drug treatment Explain the types of antiseptics, their mechanism of action., Drug	*Learning outcomes*: - has concepts of the types of antiseptics, the mechanism of their action., drug treatment

treatment	
Teaching methods	Lecture, brainstorming, story, video method, practical lesson, work with a book, dialogue, educational games, pinboard. organizer.
Forms of education	Group work ("Learning Together", "Work Together-Change Ideas"), single
Teaching aids	Board-stand, flipchart, video films, writing board, model, dummies, graph, diagrams, diagram, notes, control sheet, texts.
Study conditions	Specially equipped rooms.
Monitoring evaluation	Oral survey: express test, written survey: test

Questions on the topic:

1. List the main disadvantages of non-hardening filling materials?
2.Composition of antiseptic pastes for root canal filling?
3.Disadvantages of hardening filling materials for filling canals?
4.Method of mixing phosphate cement for root canal filling?

Tests:

What antiseptics are used to treat pockets:

Hydrogen peroxide*

Trypsin

Ribonuclease

Methyluracil

Etonius

A 50-year-old patient was diagnosed with moderate periodontitis, which drugs are used for local treatment:

Metrogyl gel *

Solcaseryl gel

Detoxification therapy

Desensitizing therapy

Materials for root canal filling should not (exclude unnecessary):
easy to enter and exit the channel *
keep the original volume after hardening *
lose initial volume
dissolve
The main disadvantage of phosphate cement when filling the canal (exclude unnecessary):
easy to insert into the canal *
does not change the volume after hardening *
difficulty unsealing the canal
fast hardening
The resorcinol-formalin method used in the treatment of periodontitis has disadvantages (exclude unnecessary):
does not lose its original volume *
does not irritate periodontal tissue *
stains the tooth pink
gives significant shrinkage
... In case of excessive withdrawal of the filling material into the apical space, it is not recommended (exclude the excess):
appointment of UHF therapy *
d'arsonval *
pull a tooth out
trepan the alveoli
Antiseptic treatment of the root canal is carried out (exclude unnecessary):
2% lidocaine solution
0.1% adrenaline solution
4% ubistizin solution
1% iodinol solution
1-2% chloramine solution
1% parkan

Interactive method

USING THE WEB METHOD

Steps:

5. In advance, students are given time to prepare questions for the lesson they have completed.
6. Participants sit in a circle.

7. One of the participants is given a skein of thread, and he asks his prepared question (to which he himself must know the full answer), holding the end of the thread and throwing the skein to any student.

8. The student who received the skein answers the question (at the same time, the person who asked him comments on the answer) and passes the baton on to the question. Participants continue to ask and answer questions until everyone is on the web.

9. As soon as all students finish asking questions, the student holding the skein returns it to the participant from whom he received the question, at the same time asking his own question, etc., until the coil is completely "unwound".

Text

In endodontics, strong antiseptics are usually used for drug treatment and root canal rinsing.

Substances used for drug treatment of root canals must meet the following requirements:

1) have a bactericidal effect on the associations of microorganisms in the root canals;

2) be harmless to periapical tissues;

3) do not have a sensitizing effect on the microorganism;

4) not to cause the appearance of resistant forms of organisms;

5) have a quick action and penetrate deeply into the dentinal canals;

6) not to lose its effectiveness in the presence of organic substances;

7) not have an unpleasant smell and taste;

8) clean the lumen of the canal from organic residues, facilitate their evacuation from the canal;

9) be chemically resistant and remain active during prolonged storage.

There are several ways of medicinal canal treatment:

1) antiseptic treatment with a cotton turunda,

wound on a root needle and soaked in a solution of a medicinal substance;

2) antiseptic treatment using paper pins soaked in a solution of the drug;

3) rinsing the root canal with a solution of a medicinal substance from a syringe through a special endodontic needle.

The last method is the most effective. Rinsing the canal from the syringe through the endodontic needle is performed as follows:

1. The tooth to be treated is covered with rollers, a saliva ejector or vacuum cleaner is placed next to it, which will quickly remove the rinsing solution along with the decay product.

2. The canal is flushed through a special endodontic needle. Endodontic needles are thin, long, have a blunt tip and lateral holes so that the fluid supplied under pressure does not enter the periapical region, but goes out into the wider sections of the canal. To reduce the risk of solution excretion beyond the apex, the tip of the needle should be located 3-5mm from the apical foramen. Before the needle is inserted into the canal, it is bent at the desired angle and a stop disk is put on to control the depth of immersion into the canal.

3. The antiseptic solution is injected into the canal with a syringe at low pressure. In total, 10-20 ml of antiseptic solution is needed to rinse the root canal during endodontic treatment. In this case, the antiseptic has a bactericidal effect; necrotic tissues, decay products, dentin sawdust are washed out of the canal, including from areas inaccessible for mechanical processing.

4. Before filling, to remove the remnants of the antiseptic solution, it is recommended to rinse the canal with distilled water and then dry it with paper points.

Next, we will consider the groups of drugs that are most often used for drug treatment of root canals.

Classification of medicinal products for root canal treatment

I. Nonspecific.

1. Oxygenated. 3% hydrogen peroxide solution, etc.

2. Halogenated preparations.

A. Chlorine.

1-2% chloramine solution, 0.2% chlorhexidine bigluconate solution, 3-5% sodium hypochlorite solution (dissolves necrotic tissues, has a bactericidal effect on gram-positive and gram-negative bacteria, fungi and viruses).

B. Iodine-containing.

1% iodinol solution is a complex compound of iodine with polyvinyl alcohol (has a bactericidal, fungicidal effect, accelerates tissue regeneration).

3. Preparations of the nitrofuran series

0.5% furacilin solution (has a wide spectrum of action, has an anti-exudative effect). 4. Quaternary ammonium compounds 0.1% decamine solution (has a bactericidal effect on spore-forming microorganisms, yeast-like fungi).

5. 20% DMSO solution (dimexide, dimethyl sulfoxide). It has an antiseptic, anti-inflammatory, analgesic, bacteriostatic, fungicidal effect.

6. Proteolytic enzymes.

Chymopsin, trypsin, chymotrypsin. They have anti-inflammatory, anti-edematous effects, break down necrotic masses, liquefy viscous secretions, especially immobilized proteolytic forms that remain active for 3 to 6 days.

7. Protein enzyme.

0.1% lysozyme solution. Contained in body tissues.

It has an anti-inflammatory effect, is non-toxic, and stimulates the body's nonspecific reactivity.

8. Ortofen.

It has a strong anti-inflammatory effect.

II. Specific

Antibiotics and their combinations with proteolytic enzymes, antibacterial agents (trichopolum).

III. Special

Complex solutions of hemin, EDTA, citric and propionic acids.

For the chemical expansion of channels, according to the data of A.N. Nikolaev and L.M. Tsepov (2004), two types of preparations are used: liquids and gels.

Thus, 0.01 - 0.03% chlorhexidine solution has an active effect on the microflora of root canals. A 2-3% hydrogen peroxide solution is successfully used.

Sodium hydrochloride has proven itself well and is widely used, a 2.5-3% solution of which has a pronounced bactericidal effect. In addition, sodium hydroxide dissolves the organic content of the canals and the dentin base, which promotes canal expansion.

The canal is processed before filling. To do this, the solution is drawn into an endodontic syringe, the needle is inserted to the entire depth of the canal and washed without much pressure. Then the canal is washed with distilled water, after which it is dried with paper pins and the canal is ready for filling.

A sodium hydrochloride solution produced by a number of companies may have special names. Thus, the Septodont company produces a stabilized solution with a 3% content of purified sodium hydrochloride called "parkan".

For antiseptic treatment of root canals, solutions are widely used: Kresofen, Endontin, Pulperil Kresodent and channel des AO Vlad Mi Va gel Grinazol, Endocal, iodoform resorbing paste - Tempofor, etc.

PREPARATIONS FOR ANTISEPTIC BANDS

In our country, for many years, a number of dental schools underestimated the role of antiseptic dressings, and the application of a dressing on a tooth between visits was considered only as a "test of the tooth for hermeticity." Currently, indications for use and ideas about the purpose of applying antiseptic dressings have expanded significantly.

The presence of deltoid branching in the area of the root apex and additional tubules makes complete removal of the pulp or its decay only imaginary. Therefore, antiseptic treatment of root canals and disinfection of pulp residues are essential to prevent the development of periodontal pathology.

To solve the above problems, an antiseptic dressing is applied, which is placed in the tooth cavity, hermetically closed with some temporary material and left for the period between visits.

When applying antiseptic dressings, preference is usually given to complex drugs that have a multifaceted therapeutic effect:

1) reduce pain;

2) destroys the bacterial flora located in the canal and dentinal tubules;

3) reduce the inflammatory process in the periodontium;

4) stimulate reparative processes in the bone tissue of the periapical region. Antiseptic dressings usually include: - 1-3 antiseptics;

- 1-2 corticosteroid hormones to quickly relieve inflammation and reduce the irritating effect of antiseptics;

- a local anesthetic drug for quick pain relief.

1. Clove oil and its derivative eugenol

They have antimicrobial, anti-inflammatory and deodorant effects. At the same time, these drugs (especially eugenol) are irritating to living tissues.

2. Phenol derivatives

Antiseptic preparations based on these substances have found

widespread use in endodontics. Their properties:

- pronounced bactericidal effect;

- good compatibility with each other and with other drugs (glucocorticoids, anesthetics, etc.);

- the absence of side reactions from the periodontium when used correctly.

The main drugs in this group:

Formmecresol is a combination of equal parts of formalin and cresol. It is a powerful disinfectant capable of breaking down and fixing tissues. The high antimicrobial efficiency of the vapors was also noted.

Camphor parachlorophenol is an oily liquid composed of 70% camphor resin and 30% parachlorophenol.

Possesses pronounced bactericidal properties and a slight irritant effect. Due to the low surface tension, the drug penetrates well into the root canals. Vapors of camphor parachlorophenol have no antimicrobial activity, therefore it is recommended to inject into the root canal on a paper point.

Camphorophenol is an oily liquid composed of 5 parts camphor, 3 parts phenol and 2 parts liquid petrolatum. Possesses weak disinfecting properties.

It is used when applying antiseptic dressings. Before applying to the tooth cavity, a cotton ball soaked in camphorophenol should be squeezed out well so that the excess of the drug does not penetrate into the periapical region.

In addition to the listed drugs, the following drugs are included in the composition of antiseptic dressings - iodoform, carbolic acid, resorcinol, formalin, silver nitrite, glycerin iodide.

Kresofen has practically no irritating effect. Moreover, it reduces inflammation and allergies. Unlike most other similar drugs, it can be combined with antibiotics.

"Cresofen" is used in the treatment of deep caries (added to the zinc oxide-eugenol lining), for the treatment of canals before filling, as well as when applying antiseptic dressings. This drug should be preferred for deeply passable canals, the impossibility of complete extirpation of the pulp, a pronounced inflammatory reaction of the periodontal tissues.

Universal preparations under the general name "Rockl", also produced by the "Seprodont" company.

Means "Rokol 4" and "Rokol 8" supplied to Russia are mixtures of antiseptics of phenol, formadelgide and guaiacol in various proportions with the addition of the corticosteroid preparation dexamethasone.

The drug "Rokol 8" on dexamethasone with a low formalin content "has a moderate antiseptic effect, it is recommended for the treatment of carious cavities with medium and deep caries, antiseptic treatment of root canals in the treatment of pulpitis after amputation and extirpation of the pulp.

The drug "Rocol 4 on dexamethasone with a high formalin content" is a stronger antiseptic and is indicated for significant bacterial contamination of root canals: in the conservative treatment of periodontitis, cystogranulomas, radicular cysts, abscesses, fistulas, etc. "Rocol 4" allows the mummification of the pulp in the deltoid branched and dentinal tubules after the application of arsenous anhydride.

Rokol preparations are used on root canals that are difficult to process, on cotton swabs as antiseptic dressings, as well as in the preparation of hardening zinc-oxide-eugenol paste for canal filling.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity,

			creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
	71-75	Good	Correct, but incomplete coverage of the issue. Correctly solves situational problems,

.		"4"	but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactory "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine .	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

10- Practical lesson

Topic: Root canal filling method. Treatment of poorly passable canals. Impregnation

Training lesson technology (practical lesson)

Time: 120 minutes	*Number of students: 10-12*
Type and form of training session	Practical lesson
Structure of the lesson	1. Introduction. 2. Theoretical part 3.Analytical part: - organizer -Test and Situational Task 4.Practical part
The purpose of the lesson:	- have an idea of the root canal filling method.
The student should know:	- concepts about the peculiarities of the root canal filling method

The student must be able to	-distinguish the method of root canal filling.
Tasks of the teacher: - have an idea of the types of root canal filling method Explain the types of root canal filling method	*Learning outcomes*: - has an understanding of the method of filling root canals
Teaching methods	Lecture, brainstorming, story, video method, practical lesson, work with a book, dialogue, educational games, pinboard. organizer.
Forms of education	Group work ("Learning Together", "Work Together-Change Ideas"), single
Teaching aids	Board-stand, flipchart, video films, writing board, model, dummies, graph, diagrams, diagram, notes, control sheet, texts.
Study conditions	Specially equipped rooms.
Monitoring evaluation	Oral survey: express test, written survey: test

Questions on the topic:

1.Disadvantages of hardening filling materials for root canal filling?
2.Method of mixing phosphate cement for root canal filling?
3.Method of preparation of the endodent?
4.What kind of pins are there?

Tests:

Incomplete root canal filling occurs if (exclude unnecessary):
good adherence of the filling material to the canal walls *
the filling material is easily brought to the top with a canal filler *
decrease in the volume of filling material due to its shrinkage
the material is not brought to the top when it hardens prematurely

Filling material "endometasone" containing a corticosteroid has the effect (exclude unnecessary):
remineralizing *
dentin-forming *

anti-inflammatory
antiseptic
Positive properties of filling materials based on resorcinol-formaldehyde resin (exclude excess):
irritant effect on periodontal tissue *
high toxicity of components *
strong antiseptic effect
disinfection of the contents of the dentinal tubules
... Root canal filling materials should (exclude unnecessary):
have a toxic effect on periodontal tissue *
have an allergic effect on periodontal tissue *
fit perfectly to the channel walls
The disadvantages of phosphate cement for root canal filling are (exclude unnecessary):
low solubility in tissue fluid *
easy canal introduction *
fast curing (4-6 min)
impossibility of unsealing the canal
In the process of instrumental treatment of the root canal, the goal is not provided (exclude unnecessary):
in the area of the apical foramen, the canal should be funnel-shaped *
the canal must be tapered *
ignoring the rules of asepsis and antisepsis
insufficient canal expansion
With mechanical expansion of the root canal with endodontic instruments, do not (exclude unnecessary):
A. work carefully without effort *
D. gradually switch from small to large tool size *
use excessive force when working with a hand drill
give the maximum number of revolutions when working with a machine drill
If the tooth does not withstand hermeticity, this means (exclude unnecessary):
complete machining of the canal *
full implementation of drug treatment of the canal *
incomplete root canal passage
preservation of pulp disintegration in the canal

Interactive method

USING THE HANDLE IN THE MIDDLE TABLE METHOD

All students of the group are divided by lot into 3 subgroups of 3 students each. Each subgroup sits down at a separate table, prepares a blank sheet of paper and a pen. The date, group number, last name and first name of the student are written on the sheet. The task is offered, to answer one question for the whole subgroup. Each

student writes down his last name and one answer option on a sheet and passes the sheet to a neighbor, and moves his pen to the middle of the table. The teacher supervises the work of the group and everyone's participation in it. The general correct version is written down in a notebook. Students who gave the correct answer options receive the maximum score - 100% of the theoretical part rating - 0.8b. Second place students - 85.9% of the rating. Third place - 70.9% of the rating. Those who did not answer or answered incorrectly 30% of the rating. The resulting score is taken into account when assigning marks for the current lesson. The works of students are saved by the teacher.

Text

After mechanical, drug treatment and drying of the canal, it is filled with filling material.Root canals can be filled in one of the following ways:

1) the method of filling with one paste or cement;

2) filling method using paste and one pin;

3) filling methods using paste and several pins (method of lateral condensation of cold gutta-percha, method of vertical condensation of heated gutta-percha);

4) methods of filling with gutta-percha heated outside the canalla ("Thermafil" system, OBTURAI injection system, etc.);

5) methods of filling with gutta-percha, softened rascreators (chloroform, eucalyptol, halothane).

ROOT CANAL SEALING TECHNIQUE PASTE OR CEMENT

Negative aspects of filling the canal with pasteor cement is an uncontrolled amount of material introduced into the root canal, the possibility of voids in the root canal, volumetric shrinkage of the material.

The paste or cement is kneaded according to the instructions and injected into the prepared root canal using a root needle, a manual canal filler or a file with pumping movements up to the root apex, the next portions of the filling material are nare oppressed to a shallower channel depth. The material is compacted with a cotton turunda after the introduction of each portion.

The filling material can also be introduced into the canal whenusing the channel filler rotating in the tip at a low speed. For this, filling material is collected on the working part of the canal filler in the off state of the tip. The canal filler is inserted into the root canal for its entire length, the drill is turned on. The canal filler is removed from the root canal when the drill is running. The procedure is repeated 2-3 times, immersing the filler to a shallower depth.

At the end of the canal filling, excess filling material is removed from the coronal part of the tooth cavity. The material is compacted with a swab in the mouth of the canal. Stripesit prepares for the restoration of the anatomical shape of the tooth.

SEALING ROOT CANALSWITH THE APPLICATION OF THE SEALING NOZZLE

In order to reduce the time spent by the patient in crescentle and improve the quality of root canal filling, increase the efficiency of the dentist, we have proposed a filling nozzle. The device consists of the following parts: 1 - crbooth # 1; 2 - cylinder; 3 - guiding cone-shaped cover No. 2; 4 - anchor; 5 - blades; 6 - channel filler handle; 7 - metal retainer wringing out the springs; 8 - squeezing spring; 9 - channel filler spiral; 10 - cannula. The filling nozzle works as follows: before the drug treatment of the canal being sealed, the guide cone-shaped cover is unscrewed with a cylinder and several portions of powder are introduced into it and, accordingly, according to the proportions of the filling material liquid. The amount of filling material depends on the number of canals to be filled. The anchor and lid No. 2 are poured onto the handle of the canal filler, the anchor is lowered into the cylinder with lid No. 1 and screwed to it. A release spring is put on the handle of the channel filler, the end of which is inserted into the metal clip on the cover No. 1, and the other end of the release spring abuts against the contra-angle housing. The end of the channel filler handle is fixed in the contra-angle handpiece. After that, the handpiece is put on the sleeve and the drill is turned on at the lowest speed. The canal filler is rotated with the tip of the drill, the canal filler handle is an anchor with blades, and the filling material, by mixing, acquire approximately the same consistency that is necessary for filling the canals.

While the filling material is being mixed, the doctor willditches medical treatment of canals, dries them.

The method of filling the root canals of the teeth is concludedin the fact that after 1-1.5 minutes after the start of the device, turn off the drill and insert the cannula of the guide cone-shaped cap into the mouth of the already treated and driedof the canal, when pressing on the tip, the pressing spring compresses the capsule with the contents, pressing against the tooth moves to the tip, and the filler spiral comes out of the capsule cannula and enters the channel to the working length, after which we turn on the drill. The mixed filling material accumulated at the outlet of the capsule rushes into the canal of the tooth and fills it.

When filling the canals on the upper jaw, the fillingThe filling material can tighten to the rotor, therefore, after the introduction of the cannula into the orifice of the canal, it is necessary to turn on the drill for 15-20 seconds, thereby creating a depot of the filling material at the outlet of the capsule.

The device is cleaned and sterilized as follows: after use, all parts of it are soaked for 5-10 minutes- they are washed in water, then cleaned of the rest of the filling material, the capsule with the rotor is sterilized in a dry-air cabinet, and the spring and canal

filler are treated with antiseptic solutions.

The device is refueled by a nurse.

The proposed device has the advantage that it

can be used many times in one shift. Refills capsuleOnce a large amount of a long-hardening filling material is applied and after each patient the capsule, spring and tip are treated with alcohol.

The doctor has the ability to perform several stages at the same time. This shortens the time and improves the quality filling of canals, the efficiency of the dentist's work is increased.

The use of this device reduces the time of staythe patient in a chair up to 17-18 minutes and facilitates the work of a dentist.

We have received a copyright certificate for this device. state certificate No. 143858 of 22.04.1988, issued by the State Committee of the USSR for Inventions and Discoveries.

Currently, the device is successfully used bychami of therapeutic departments of republican polyclinics.

SEALING THE CHANNEL WITH ONE PIN Root fillingchannels with paste without pins are not carried out in a number of countries. Filling with one paste, if taking into account underfilling, re-filling, resorption, does not guarantee reliable obturation of the canal.

But this is not considered a guaranteed treatment. With the introductionWith the introduction of new technologies to the Russian dental market, it became possible to introduce into endodontic treatment such methods as filling canals with one pin, the method of lateral condensation, and the use of thermaphiles. Thus, to carry out guaranteed treatment of the population.

With the advent of standardized tools and a pin comov, the indications for the use of the one-pin filling method have expanded. It became possible to use this method in any cases, regardless of the channel diameter.

The main step in filling the canals withsuch a technique is the selection of the pin. You need to take a pin the same size as the drill with which the channel was widened, and one size smaller. And the length should correspond to the working length of the tooth. Before filling, they must be inserted into the canal and the depth of penetration must be checked, taking into account the length of the root.

After the selection of the pin, the tooth is isolated from saliva and rinsingchannel antiseptic solution (001-003% chlorhexidine solution, 2.5-3% - sodium hypochlorite, 2-3% - hydrogen peroxide) from an endodontic syringe. The needle is inserted to the full depth of the canal and washed without much pressure, followed by irrigation with water. Then the tooth is dried: the cavity of the tooth with a stream of air, and the

channels with paper pins. The introduction of the paste (endo-sealant) with the channel filler is carried out according to the generally accepted technique, however, the consistency of the paste should be less thick, which will allow the pin to reach the desired depth.

It should be noted that for hard pins, the preferredit is necessary to use endo-sealants: zinc-eugenol cements, pastes based on zinc oxide and eugenol, for plastic pastes based on epoxy resins and with calcium hydroxide. After a single injection of the paste, a pin is inserted into the canal to a previously measured depth. This is how 1-2 or 3 channels are sealed, after which an X-ray is taken. With correct filling of the canal, a bandage of water dentin is applied for several days. It is impossible, immediately after filling the canal with a pin, to remove its excess with a boron, even with a turbine, since the pin is removed from the canal when the paste is not hardened during the rotation of the boron. If necessary, on the first visit, remove the excess pin to the level of the canal mouth with a heated probe or plugger. It is advisable to fill the carious cavity at the next visit.

SEALING OF CHANNELS WITH SOLIDMATERIALS

Although the most preferred material at presenttime is gutta-percha, other solid materials are successfully used for obturation of canals. The most commonly used pins are silver. Stainless steel and chrome-cobalt pins, although useful in certain situations, are rarely used.

Solid materials can be divided into: semi-rigid (flexible) and rigid (inflexible). Semi-rigid materials such as silverStainless steel pins and instruments are flexible and can easily bend to follow the significant curvature of the channels. For all practical purposes, rigid materials such as vitalium (cobalt chromium) posts are inflexible and cannot follow the curvature of the canal.

Silver pins

Advantages

Silver pins are made according to the size of the instruments, making it easier to find the pins. They showXia flexible and, before insertion, can be bent to fitwith a channel bend. They can be used in narrow or tortuous canals, where it is dangerous and not recommended to widen the canal with instruments larger than 20-25 sizes. Due to their relative stiffness, ease of insertion and control of length, silver posts are sometimes used to circumvent canal irregularities or to replace broken instruments or when filling complex multi-rooted teeth. They can also be used to fill part of a canal or as a diagnostic probe.

disadvantages

Great care is needed to accurately position the silver pins as they can bend into an elliptical shape.nale, contacting with its walls only in two places, creating the appearance of a dense entry. Unlike gutta-percha, silver posts do not compress and cannot fill all the irregularities of the canal. In oval canals, this lack of fit makes it necessary to fill the space between the post and the dentinal wall with a thick layer of cement, which complicates a high-quality filling.

Removing the silver post for re-treatment or the installation of the support pin is sometimes difficult.

A potential hazard to silver pins isCorrosion occurs. It is caused by the penetration of interstitial fluids into the canal and the exit of the nail beyond the apical foramen. This is why signs of corrosion are most evident in the apical third of the posts. Therefore, the prevention of corrosion of the silver post depends on the care and quality of the filling.

Investigating the relationship between silver post corrosion and endodontic treatment failure, Goldberg found thatthe presence or absence of corrosion observed in scanning electron microscopy was confirmed by microanalysis.

Microanalysis with an electron probe revealed that in the apical parts of the corroded silver pins contained phosphorus, sulfur, chlorine, calcium and some amounts of sodium and potassium.

Using a scanning electron microscope, Seltzer and the co-authors found that in cases of unsuccessful treatment, silver pins in contact with tissue fluids corroded, resulting in the formation of silver sulfide, sulfate and carbonate. These substances can damage periapical tissues, although the concentration of metal ions required to damage the tissues is not known.

Zielke et al implanted silver pins in the tibia of rats and found them to be good.good tissue tolerance despite corrosion. This confirms Goldberg's (a) findings that in some apparently successful cases of silver post fillings, assessed by clinical and radiological criteria, in fact, some apical corrosion of these posts took place.

It is better not to install silver pins in the followingsituations:

1. In the wide canals of the anterior teeth of the upper jaw.
2. In the horseshoe-shaped or oval canals of the premolars, palatine roots of the upper or distal roots of the lower molars.
3. In the teeth of young patients, when the roots are incompletely formed, and the canals are wide or asymmetric.

4. In surgical cases when root resection is supposed.

5. In teeth where it is difficult to avoid the removal of the filling material by the apex (in this case, a guttaper is preferablecha, since it is better tolerated by the periapical tissues).

Selection and fitting of pins

In theory, a silver pin of the same standard size as the last instrument used for raceswidening the canal, should fit tightly into the prepared canal. However, experience shows that the ego is rare. Therefore, the selection and fitting of silver pins must be done very carefully. Sonya No. 3, Burns P. (1987)

Pin selection. For quick selection of the main silver pin moA standard micrometer or a special measuring instrument (calibrator) must be used. The last file used to widen the canal is placed in the opening of the gauge so that its apical part protrudes approximately 2 mm. You need to choose a silver pin so that it protrudes the same length through the same hole. If during this screening the apical part of the post breaks, then it is grinded with a fine emery wheel. The post, disinfected in alcohol or in a salt sterilizer, is inserted into the canal using a clamp or tweezers. X-rays are not taken until the following requirements are met. In recent years, such a selection has disappeared because all endodontic instruments and fonts are calibrated and produced in size.

1. The selected post is immersed in the treated canal for full working length. If it is short, the apical 2-3 mm can be made slightly thinner by grinding them on a grinding wheel, or you can slightly widen the canal and rinse it abundantly to remove organic tissue debris. After this, the pin is re-inserted.

2. The pin is fitted tightly and requiresabout considerable effort. If it is easy to remove, then you need to shorten it by 0.5 mm, grind it and re-insert it into the canal. The procedure is repeated until a very tight fit is obtained. Often, a post slightly protruding beyond the apical foramen creates the impression of a tight fit. Shortening the post so that it does not protrude beyond the apical foramen will show that it was actually positioned freely in the canal. In this case, the pin must be shortened further and reinstalled until it fits very tightly. In the oval canal, it can only contact the canal walls at two points and give the impression of a tight fit. For the successful use of silver posts, it is necessary to prepare the canal very carefully so that the cross-section of the apical part of the canal is rounded. The tightness of the apex filling should not depend on the root canal cement or on the compressibility of dentin or silver, but should be based on the precise fit of the round post and the round shape of the last 2-3 mm of the canal. In the apical 2 mm, a well-fitted silver post should fit just as

tightly and precisely as a good gold inlay.

3. The pin must not be pushed apically with any force. Ideally, the apical tip of the nail should fit very tightly at a distance of 0.5-1.0 mm from the apical foramen. When cemented, it will be covered with root cement and will not come into direct contact with tissue fluids. The root cement will protect the post from corrosion.

When all three of the listed requirements for choice and mouthnew the post will be made, it is bent fret with the incisal or occlusal edge, tightly pressing the rod against the anatomicalto a reference point on the occlusal surface. When the post is flexed with forceps, strong apical pressure is applied to advance the full working length. X-rays are taken to check the position of the pin. If it is within 1 mm of the radiographic apex, cementing can be performed.

Cementing the post... On a cemented pinthose, to mark the place of breaking off, make a notch with a carborundum disc at a low speed, about 2 mm above the cervical line.

After the cement has been placed in the canal, the post is disinfected as mentioned above and, with light but persistent apical pressure, is slowly introduced into the canal to its full working length whenthe bent section will come close to the place where it was previously bent. Then, to fill the void and the entire space of the canal, lateral condensation of additional gutta-percha pins is performed. X-rays are taken to check the filling.

If the post was notched before cementation, then its crownThe forged part can be easily removed with tweezers by sliding back and forth until it breaks off. In order not to disturb the installation of the post during removal of the rest of its part, a constant apical pressure is applied with forceps. The post is gently bent over the bottom of the cavity and covered with gutta-percha and then with zinc phosphate cement. The protruding coronal part of the post can also be removed using curved scissors. Another way to remove the protruding crown part of the post is as follows. Zinc phosphate cement is placed in the cavity around the post. When it hardens, the protruding part of the post is removed with a new inverted taper bur. A temporary filling is then placed, the rubber dam is removed, and the bite is checked.

Method using part of the post

The split method, or the method using a part of the pin, is used mainly when the mouth is supposed tonew crown with support pin. The silver pin is carefully adjusted and a few millimeters from the apex incised with a carborundum disc to mark the place of its breaking off apically after firm installation. Root cement and post insertion are

performed as usual.

After cementation and X-ray control, applying significant pressure with tweezers in the direction of thekhushki, the pin is unscrewed, leaving its tip firmly embedded in the apex area. Instead of tweezers, the fitted pin can be held firmly in the control handle to improve its maneuverability during cementing. Therefore, the post can be easily inserted with a delicate tactile sensation and can be positioned accurately and securely with just fingers. When installed in the control handle, the pin unscrews more easily.

The unsealed part of the canal is prepared for the installation of a support pin in the crown, or gutta-percha pins are added and their vertical condensation is performed to the apical part, which isthe neck of the silver pin. Such condensation of gutta-percha is effective and is used for internal resorption or filling of lateral canals with control of the exit of filling materials beyond the apex.

Advanced Silver Pin Technique-tami. Refined silver pins set in the handlecolor-coded kax with the same dimensions as standard tools. They are used with thumb and forefinger, not tweezers. In this case, the fit and cementing of the post is controlled by the doctor using tactile sensitivity.

Well-controlled apical pressure combined with back-and-forth rotation.Enables firm and secure placement of the post in softer dentin. Hand-held, the improved silver pins can be successfully used in the split technique.

Technique with apical silver tips... ApiSteel pins or silver tips are standard sizes and lengths of 3 or 5 mm. They are screwed onto a 40mm handle. After fitting and cementation, the post is unscrewed onto the handle, leaving the tip in the apical part of the canal. Apical silver tips are an improvement of the split technique using a part of the post and are used when an indication for a crown with an abutment post is indicated.

ROLE OF ROOT CEMENT IN CEMENTING SILVER PINS

Gutta-percha can be softened and, under strong condensation pressure, it will adhere to the entire complex innerchannel structure. The space of the canal is almost completely filled with a hard post made of inert gutta-percha with a minimum amount of absorbable final cement. The silver pins, although flexible, cannot deform enough plastic to match the irregularities of the canal. Therefore, for filling the space between the post and the canal walls, root cements are absolutely necessary. For successful filling with silver posts of several millimeters of the apical part, it is necessary to prepare a perfectly round canal so that the post fits snugly against its walls.

Any biocompatible root cement can be used, but the silver posts are preferably cemented with root cement, which hardens quickly and has little strength.creativity. It is better to use plastic resins such as Diaket-A or AH-26, which are relatively non-absorbable and have adhesive properties.

Gutierrez et al. Filled the roots of extracted teeth with silver posts using Diaket-A, AH-26 or Tubleseal as root cements. These roots were then implanted into the subcutaneous tissue of rats. The results, analyzed after 30, 90 and 150 days, showed that with adequate coverage of the silver posts with root cements, there was corrosion. Plastic resins (Diaket-A, AH-26) gave better results than Tubleseal.

For cementation of a silver post, root cement should be mixed to a thick, pasty consistency and cover the canal walls well with it, even if the post is well covered with cement before insertion, due to the tight entry, the cement is often wiped off the post before it reaches the apex. If the walls of the canal are not well covered with cement, then the apical part of the post will not reach the working length without root cement, which will result in poor filling of the apex with subsequent penetration of fluid and corrosion.

In very narrow canals, the lateral space between the pinthe volume and walls are completely filled with root cement. However, whenever possible, lateral and vertical condensation should be performed with additional gutta-percha pins.

There is a technique according to which the canal is first filledRoot cement and gutta-percha are applied, then a heated silver pin is inserted up to the apical foramen. The post can be removed, re-heated and inserted several times until it is in the desired apical position.

Another method is to cover the silver post with gutta-percha. After adding cement into the canal, it is injected withSilver pin covered with a layer of dry chloropercha. During the apical advancement of the post, it should be in contact with hot forceps or forceps. The heat softens the chloroperch and allows the post to set apically.

ADVANTAGES OF GUTTAAPERCHI COMPARED TO WITH SILVER PINS

Many materials and techniques are used for successful canal obturation. Silver pins properly fitted andcemented in the circular apical part of the canal can give good results. However, as mentioned above, they have more disadvantages than gutta-percha. They were very popular in many dental schools and private practitioners 15-20 years ago. Currently, the main focus is on gutta-percha as the preferred material for filling canals.

When using silver pins, the canals are often inadequately cleaned and shaped. More tWow, obtaining good radiographs with silver posts does not necessarily mean that the posts are firmly and correctly apically positioned, especially if the canal is oval in the buccal-lingual direction. This alone can increase the failure rate when filling with silver pins. Nowadays, with the help of burs (Gates-Glidden, Jovanovic and Girdwood), standard files, reamers and effective chelators, canal cleaning is performed better and faster. So much attention paid to thorough cleaning and the formation of a channel of optimal dimensions, reduces the weightThe likelihood of finding irritants, bacteria and residues of organic tissues in it makes the laying of gutta-percha into the canal easier and more efficient. With the help of careful lateral and vertical condensation with various pluggers, gutta-percha can be condensed tightly and filled in irregularities and hard-to-reach parts of the canal system without great effort. Obturation of canals with gutta-percha often reveals well-filled accessory canals and multiple openings, which increases the rate of successful endodontic treatment.

SEALING TECHNIQUE

1. Selection and adjustment of the pin

A standard post is taken of the same size as the last endodontic instrument used to cut the apical part of the canal (master file). Metal pin moIt is necessary to pre-bend in accordance with the curvature of the canal. The post is inserted into the canal to the working length, while the tip of the post should be slightly wedged in the apex area. A mark is made on the pin to fix the working length. In doubtful cases, X-ray control of the position of the pin in the canal is performed.

2. Introduction of paste into the canal

In this case, the paste is kneaded with a more liquid consistency than when filling the canal with paste alone. Pa-100 is inserted into the canal with a K-file, K-reamer or a canal filler up to the level of the apical foramen. It is not recommended to fill the canal tightly with paste: when using a canal filler, one portion is enough, when using "hand" instruments - two or three portions.

3. Preparing the channel for the post.

This operation is performed to facilitate the introduction of the post into the root canal. For this purpose, a K-reamer of a smaller diameter is slowly introduced into the canal to the apex and also slowly removed.meter than the matched pin. This stage is carried out with the use of gutta-percha pins. When using metal pins, it is not necessary to carry it out.

4. The introduction of the pin into the canal.

The post is covered with a filling material and inserted into the canal to the working length. The movement of the pin should be slow in order to expel air bubbles from the channel. For the same purpose, it is recommended to make several reciprocating movements of the pin in the channel. Excess filling material squeezed out of the canalremoved with an excavator or cotton ball.

5. Removing the protruding part of the pin.

The protruding part of the gutta-percha pin is cut off with a heated trowel. The silver pin is either cut off with scissors or folded over at the bottom of the tooth cavity. It is impossible to cut the pins on the first visit with a bur, because thiso leads to a violation of the hermeticity of the root filling.

LATERAL CONDENSATION METHOD

It is often preferable to the single post method as most teeth have wide canals or branches that cannot be tightly sealed with one gutta-percha or silver pin. Introduced and laterally condensed around the main additional pins, effectively fill the asymmetric canals.

In an in vitro study, Wong et al found that with lateral condensation, the shape of a cast gold artificial root canalLa reproduced noticeably worse than with vertical condensation of warm gutta-percha, in which more gutta-percha was placed in the canal. In terms of its ability to reproduce the shape of a standard cast gold root canal, mechanical condensation was rated higher than lateral condensation.

LATERAL AND VERTICAL METHOD CONDENSATION

For effective use of gutta-percha pins in качестве пломбировочного материала просвет корневого канала нужно специальным образом сформировать и подготовить. Он должен иметь равномерно расширяющуюся конусообразную форму с максимальным сужением в области дентинно-цементной границы (на расстоянии около 1 мм от рентгенологической верхушки) и наибольшим диаметром в области эндодонтического доступа. Это сужение с минимальным открытием верхушечного отверстия действует как матрица, являющаяся упором для эффективной конденсации гуттаперчи. Физиологическое апикальное сужение в области дентинно-цементного соединения предотвращает выход пломбировочного материала за пределы корневого канала.

Избыточное инструментальное воздействие разрушает апи- кальное narrowing and promotes the exit of the filling material during condensation outside the channel. This results in poor condensation of the material with a questionable apical seal. The release of any filling material into the periapical tissues will cause periapical inflammation.

Preparation for cementing.Canal disinfected again irrigation solution. With file No. 15 or 20, the doctor checks the patency of the canal for the entire working length and makes sure that there are no fragments of pulp or organic matter left in its apical part.

Check the correct tight fit of the main pin, which should be immersed in the canal by 1 mm, without reaching the radiological apex of the root, fromit is treated and placed in 70% isopropyl alcohol.

To remove residual moisture from the canal, its walls must be dried before filling. This can be done by irrigating the canal with a solution of 95% ethyl alcohol or 99% isopropyl alcohol using an irrigation syringe. For eEffective effect, alcohol should remain in the channel for 2-3 minutes. Then the canal is dried with sterile absorbent pins inserted to a depth of 1 mm shorter than the working length. While the doctor prepares for the filling, an absorbent paper point is inserted into the canal to absorb the exudate.

For lateral and vertical condensation, sterile spreaders and pluggers are used. Spreaders are longtapered and pointed instruments for condensation of the filling material laterally to the canal wall, which creates space for the introduction of additional pins. Pluggers, or compacts, regardless of their width, have a blunt apical apex and are used for vertical condensation of gutta-percha. Like spreaders, pluggers come in a variety of sizes, graduated on the tip and fixed on long or short handles.

Pluggers selection.For use in coronal, medium and the apical parts of the canal, three or four pluggers are preselected so that they freely enter the canal lumen. During vertical condensation, the plugger will condense the gutta-percha apically without resistance from the canal walls.

Cement application... The presence of moisture in the channel is determined by абсорбирующему штифту при его удалении. При необходимости канал повторно высушивают дополнительными штифтами.

Цемент вносят в канал небольшими порциями на стерильном римере. на один размер меньше последнего инструмента, использовавшегося для расширения канала. Если сначала вносить корневой цемент очень маленькими порциями, то в канал будет попадать меньше воздуха. Ример, на 1 мы не достигающий рабочей длины, вращают противчасовой стрелки, одновременно вынимая его и

распределяя корневой цемент по каналу. Затем для тщательного покрытия стенок канала и удаления воздушных пузырьков из цемента производят осторожное медленное нагнетающее движение вместе с латеральным вращением инструмента. Процедуру повторяют до тех пор, пока стенки канала не будут хорошо покрыты цементом.

An absorbent post or canal filler can also be used to apply root cement. It is spiralth wire tool for applying the paste. It is rotated between thumb and forefinger or used in a handpiece. When rotated clockwise, it injects the root cement into the apical part of the canal. When using it mechanically, a little cement is first injected manually into the canal to a depth of 2-3 mm from the apex. The instrument is then rotated very slowly as it moves away from the canal. With the acquisition of skill, the excess cement will not go beyond the apical foramen. If there is a sudden blockage in a curved or narrow channel, or if the motor is reversed, the filler may break. A spiral broken in the canal is almost impossible to remove, since its rings are tightly pressed against its walls.

Lateral and vertical condensation technique.Basic pin

removed from alcohol and air dried. Its apicalthe part is covered with root cement and carefully, slowly inserted into the canal to the specified length (until the mark on the post coincides with the incisal or occlusal edge of the tooth). After a pause of a few seconds, the pin is advanced further until it enters the full depth. Slow introduction the pin squeezes excess root cement in the direction crowns.

*Note:*if anesthesia was not carried out, then upon reachingWhen the apical part of the canal is held by the post, the patient may experience slight discomfort. It can be caused by air ingress. It takes time for the air and excess cement released from the top to dissolve.

Along the main, you can enter one or two auxiliarypin without using a spreader. If there is any doubt about the relationship between the main post and the apex, an X-ray examination should be performed prior to insertion of additional posts using a spreader. If the post extends beyond the hole, usually due to improper apex preparation, while the cement still retains its plasticity, the post can be easily removed, shortened and the procedure repeated. If the post is short, then vertical condensation of the gutta-percha can be performed with advancement towards the apex.

After that, a spreader is introduced along the main pin, a clamppin to the wall of the canal, and, rotating the instrument by half a turn, apply lateral and apical pressure,

creating space for an additional pin

The spreader is removed with one hand, while the other hand isThe space just created by the instrument is inserted with an appropriately sized gutta-perch pin. It is not necessary to cover the additional posts with root cement prior to insertion into the canal. Some doctors immerse the pins in cement or eucalyptol to lubricate and facilitate insertion into the prepared space.

Then the spreader is again forcibly inserted in the apical direction, creating space for another post. So rePress several times until the wedged pins block further access to the canal.

Currently, to achieve greater density and the compactness of the filling and for filling with filling material of all complex configurations and branches of the root canal system, the methods of vertical and lateral condensation are combined.

The thick ends of the pins at the level of the mouth of the canal are cut offwith a red-hot instrument while the gutta-percha is still soft due to heating, its vertical condensation is immediately performed. It is condensed apically with a preselected cold plugger. To prevent the warm gutta-percha from sticking to the instrument and stretching when removing the plugger, it is immersed in cement powder.

Red-hot plugger of suitable size guttathe pepper is removed 3-4 mm below the mouth of the canal. While the gutta-percha is still warm, a pre-selected plugger with a smaller diameter is used for its further vertical condensation. Pluggers should freely enter the canal and move in gutta-percha all the time, without experiencing resistance from the walls of the canal. Due to vertical condensation, gutta-percha is pushed into the apical part of the canal, and the root cement in its branches, which increases the likelihood of filling additional canals and holes.

Then, continuing to work as spreaders, they introduce additionalsolid fonts and thus fill the entire channel. If the instrument is immersed in the canal less than 3-4 mm from the mouth of the canal, work with spreaders is stopped.

The protruding free thick ends of the pins are removedwith a red-hot instrument and gutta-percha condense tightly vertically.

To ensure that there is a homogeneous filling at a distance of 1.0-0.5 mm from the apical foramen and there is noand radiography is performed in the channel of radiolucent inclusions or air bubbles. If the filling is short or has voids, then the gutta-percha is removed, heated red-hot, with a plugger as much as necessary. For apical condensation of softened gutta-percha, use a cold plugger with a smaller diameter.

The vertical condensation in combination with the lateral condensation is repeated until the canal is filled to the desired length.

The filling procedure is completed as follows.

After a dense and complete filling of the canal,After radiographically, the coronal part of the gutta-percha is removed with a heated instrument to the level of the mouth of the canal. Then the gutta-percha is condensed apically with a cold plugger, forming a clean and smooth surface slightly below the neck line. The cement from the pulp chamber is removed and wiped with alcohol or chloroform. The crown is filled with a small amount of cement (a permanent filling is placed later). The dam is removed, the bite is checked, and two images are taken at different horizontal angles for future comparisons. If it is planned to install a support pin, then gutta-percha is removed with a red-hot calibrated plugger or a suitable rotating instrument apically somewhat deeper, the chamber is filled with cotton balls and the access is closed with temporary cement.

Combination of lateral and vertical condensation when done correctly, it gives a high-density filling and allows effective three-dimensional and complete filling of a complex root canal system.

TREATMENT OF INSTRUMENTALLY INACCESSIBLE (IMPASSABLE) CHANNELS

Root canal patency depends mainly on the degree of penny of its curvature and the location of the curvature:

- up to 25º - the channel is instrumentally accessible;
- from 25º to 50º - the channel is instrumentally difficult to access;
- from 50º - the channel is unavailable.

The location of the curvature closer to the mouth part makes it possible to expand the mouth part and facilitate the passageroot canal even with significant curvature. There are other possible reasons for the obstruction of the canal.

In the presence of hard-to-reach and inaccessible channels in the treatment of pulpitis, devital amputation with subsequentmummification of the root pulp. For this purpose, it is possible to carry out the impregnation (soaking) of root canals with a liquid of a filling material containing resorcinol and formalin, for example, forfenan, foredent, etc. In their composition, in addition to resorcinol and formalin, liquids contain a

catalyst for the polymerization reaction. The liquid under the influence of the catalyst turns into a glassy mass. Impregnating compositions have the ability to penetrate into the microtubules of the hard tissues of the tooth, providing a disinfecting and blocking effect. They are capable of staining the tooth.

For impregnation, solutions and pastes are also used,containing parachlorophenol (cresodent, cresophen, cresopats, etc.). Their antimicrobial action is associated with denaturation of proteins of microorganisms in the canal. The material hardens by binding to the intracanal fluid.

Impregnation of instrumentally inaccessible channels can becarry out by the method of silvering, using an aqueous (30%) or alcohol (3%) solution of silver nitrate. A 4% hydroquinone solution is used as a silver reducer. Sterilization of root canals by this method is based on the property of silver nitrate to deeply diffuse into the dentinal tubules, to have a pronounced bactericidal effect (oligodynamia). Obturate the dentinal tubules by film formation (silver mirror reaction). The treatment is also carried out in three visits. Silver ions can also be introduced into the channels using electrophoresis. The method is popular in children's practice.

Currently, the method is proposed as an alternative treatment of hard-to-reach canals - depophoresis of medical hydroxide, which is also carried out in 2-3 visits. When using this method, tissues are saturated (a depot is created) with ions of calcium hydroxide, copper hydroxide, hydroxyl group. Filling of the traversed part of the root canal is carried out with atatsamite. Mandatory conditions are the passage of the channel by 1 / 3-2 / 3, excluding the ingress of copper-calcium hydroxide into the periapical tissues. According to Professor Knappvost, under the influence of an electric field, the hydroxide of medical, penetrating into the canal system, provides sterilization of root canals and dentin and obturation of the holes.

An important place in endodontic treatment is occupied by antiseptic treatment of root canals. Removal of the infected dentin of the root canal and skillful impact on the microflora of the dentinal tubules is one of the conditions for achieving good treatment results. In cases where the canals are poorly passable and curved, it is not possible to carry out all stages of treatment. In these cases, impregnation methods are known. When using this method, we do not always get the desired results.

We have made an attempt to use the kineticenergy needleless dental injector for the injection of drugs into the periapical tissue. To do this, we have developed a technique that consists in the following, after the stage of expansion of the root canal

orifice, the end of the therapeutic nozzle, already prepared for the operation of the dental needleless injector, is inserted into the root canal orifice close, slightly pressing it so that the hole in the nozzle is like a continuation channel. A shot is fired. The stream of medicinal substance along the path of least resistance penetrates into all dentinal tubules and through the apical foramen into the periodontium. The penetration of the drug into the marginal periodontium is observed significantly less than into the apical one. In this way, it is possible to carry out antiseptic treatment, and then impregnation of difficult-to-pass root canals.

The difficulty of carrying out this method was thatAll products used for the treatment of root canals are active aggressors that cause corrosion and damage to the instrument, so it was decided to place the bottle between the tooth and the injector. For this purpose, the therapeutic nozzle was cut in half and with the help of a tee, both ends of the nozzle were connected to a dropper, and the latter, in turn, was connected to a bottle into which an antiseptic substance was poured.

The principle of operation of the device is as follows: afterpumping and checking the technical condition of the injector according to the instructions, insert the end of the therapeutic nozzle into the mouth of the treated

channel, press and immediately release the movable piston of the dropper, the latter, with the help of a squeezing spring, becomes the initialposition, passing exactly one drop through the dropper cylinder, about 0.3-0.5 ml of antiseptic substance from the bottle into the tee, after which we fire and

njectors. For antisepticFor the treatment of root canals, we use 5% iodine tincture, 3-5% sodium hypochlorite solution, which is poured into a bottle with a dropper, and 70% ethyl alcohol or distilled water is poured into the injector bottle. When fired, the alcohol passes through the injector system, reaches the tee, mixes there with a drop of iodine and then penetrates into the root canal. The dose of alcohol is set on the 0.1 ml injector. Thus, it is possible to vary the means for antiseptic treatment of root canals, for example, 40% solution of urotropine, 2% solution of chloromine, 0.15% solution of chlorhexidine, 3-5% of p -p sodium hypochlorite or 0.5 solution of furacilin, and distilled water in a bottle on an injector.

This method can be used to impregnate difficult to passwashed root canals. To do this, we add a freshly prepared resorcinol-formalin mixture to the bottle located on the nozzle, and a 7% alcohol solution of caustic soda into the injector bottle. According to the method described above, we make 1-2 shots at the mouth of the

canal, a dose of 0.1 ml was set on the injector. But after working with a resorcinol-formalin mixture, the working part must be thoroughly rinsed in a 3% hydrochloric acid solution, rinsing well in water, and wiped dry. The use of this method of treatment of difficult-to-pass canals allowed us to significantly reduce complications after the treatment of teeth with chronic periodontitis by up to 3-5%.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
	81-85	Good	The correct answer to questions about

.		"4"	the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactoril y "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactoril y "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine .	55-60	Satisfy flax "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

VI- semester.

1- Practical lesson

Topic: Age-related changes in the pulp. Pulp structure and function. Acute focal pulpitis. Clinic. Diagnostics and differential diagnostics.

Technological map of the practical lesson

Stages of work	**Teacher**	**Student**
1. Stages of preparation (10 minutes)	1. Controls the purity of the audience; 2. Checks the readiness of students for classes; 3. Controls attendance;	Listen
2.The introductory stage to classes (10 minutes)	1.Preparation on the topic of content; 2. Preparation of slides for the introductory report; 3. To develop the literature used for the study of the subject;	Write down the topic and listen
3.Main stage (135 minutes)	1. Dividing students into 2 small subgroups, asking questions on the topic; 2. Use of slides and multimedia; 3. Carries out medical work; 4. Combines all information on a given topic, actively the participating students are encouraged and appreciated;	Divided into small groups watching, participating, listening. The student expresses his opinion, complements

		and asks questions
4. Final stage (25 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listen Record Record

Questions on the topic:

1. The reasons for the appearance of diseases of nocaries.
2. Principles of local treatment of nocaries disease.
3. General treatment of diseases of nocaries.
4. Prevention of diseases of nocaries.

Tests:

Interactive method

USING THE WEAK LINK METHOD

To work you need:

1.Set of questions on the topic
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3.Stopwatch.
Progress:

1. The game is conducted by a teacher and student assistant - a counter.
2. The counter on the sheet writes the date, group number, faculty, the name of the business game and the list of students in the group.
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4. The student must in 5 seconds. give an answer.
5. The teacher evaluates the answer with the word “correct” or “incorrect”, if “incorrect” he himself gives the correct answer.
6. The counter puts “+” or “-” in front of the student's surname, depending on the correct answer.
7. Students pass 2 rounds of questions in this way.
8. After 2 rounds of questions, the game is suspended and the students who received 2 minuses are eliminated from the game as a "weak link".
9. The game continues in a new circle with the remaining students. Again, they are offered one new round of questions and again students are eliminated who, in total with the first rounds, have 2 minuses.
10. Round by round, the strongest participant in the game is selected, who answered the most questions.

11. On the sheet against each surname, the teacher registers - who dropped out in which round and became the "weak link".

12. The game is estimated at a maximum of 0.8 points.

students who dropped out after the first 2 rounds of answers receive "0" points for the game,

after 3 round of answers - "0.2" point,

after 4 round of answers - "0.4" point,

after 5 round of answers - "0.6" point

the strongest participant gets 0.8 points.

13. The points given on the protocol sheet are taken into account when calculating the current total of the lesson as an estimate for the theoretical part.

14.In the lower free part of the journal, the teacher makes a note about the conduct of a business game, the headman signs.

15. The game protocol is saved.

Text

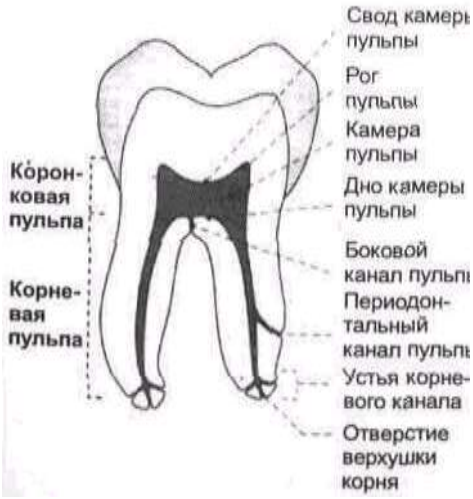
Pulp structure

The core of the soft tissue of the tooth is called the pulp of the tooth and consists of sufficiently innervated and vascularized connective tissue.

The space filled with pulp tissue is called the pulp chamber.

Accordingly, from a topographic point of view, the crown cavity, root canals, coronal and root pulp are distinguished.The pulp chamber is surrounded by dentin and its outline in a reduced form corresponds to the contours of the tooth

The incisal, or occlusal processes of the coronal pulp are called pulp horns, and their shape corresponds to the shape of the bumps on the occlusal surface.



Rice. 9-1. The structure of the pulp of tooth 222

The dentinal layer covering the cavity of the crown is called the fornix of the pulp chamber.

The pulp tissue communicates with the periodontium through the root apex opening, lateral accessory canals and periodontal canals (Fig. 9-1) Due to its localization, the pulp can be defined as an end organ without collateral circulation

9.2 Base substance, connective tissue and pulp cells

The main substance of the pulp of a jelly-like consistency is a matrix containing cells, fibers and blood vessels.Along with other molecular components, it consists mainly of glycosaminoglycans, or proteoglycans

Pulp tissue contains collagen fibers that form a network Elastic fibers are found only in the walls of larger blood vessels

The characteristic cells of the pulp are odontoblasts; in addition, there are fibroblasts in the pulp that replace cells and cells of the immune system.

Dentin-forming odontoblasts densely cover predentin Cells in the coronal pulp are in the form of a column with a basal nucleus, in the middle and apical parts of the root they acquire a cubic or flat elongated shape

Towards the predentine, the cell membranes visually thicken and adhere tightly to each other However, this microscopic structure does not correspond to the natural structure of the membrane, representing only seals or stratifications of odontoblasts Histologically, the cells are considered as layering, in fact, each of them has a

cytoplasmic process entering the dentinal canal -cy and covering the periphery of the dentin

Fibroblasts - this is the most common type of cells that produce the main substance, as well as flat and spindle-shaped collagen fibers, which are evenly distributed throughout the pulp tissue

Replacement cells- these are highly potential mesenchshy undifferentiated cells. After appropriate stimulation, their daughter cells turn into any type of cells available in the pulp, in particular odontoblasts

In addition to the above, in the pulp there are always such single free cells as histiocytes, monocytes, chimphocytes and macrophages, that is, individual cells of the immune system

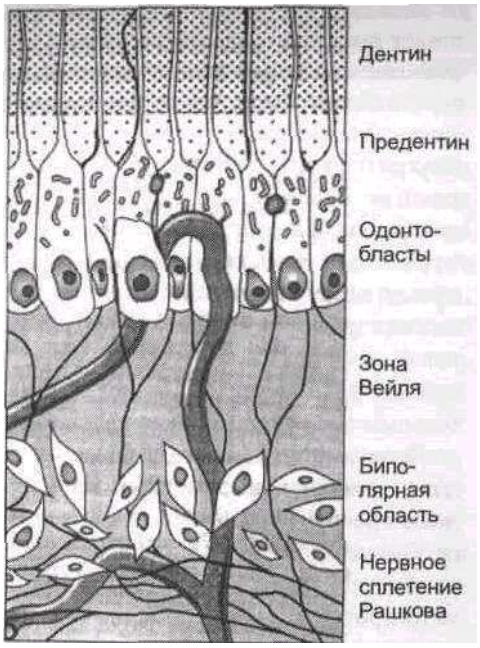
9.3 Tissue areas of the pulp

The structure of the pulp tissue is heterogeneous and has a layered structure (Figure 9-2)

A bundle of connective tissue, with blood vessels and nerve fibers in the center, is surrounded by an area containing a large number of undifferentiated cells, fibroblasts and nuclei called the bipolar region. Large branches of the central nervous system known as the Rashkoff plexus are also located here.

The peripheral layer of the pulp is bordered by an area with a limited number of nuclei, or Weyl's zone. This area has a small number of cells, but contains cytoplasmic processes of fibroblasts of the layer rich in nuclei, as well as the terminal branches of nerve fibers.

A layer of odontoblasts is located between the Weyl zone and predentin



Rice.9-2. Diagram of tissue areas of the pulp (after aver-, 1973)

9.4 Pulp blood vessels

The pulp is well vascularized, the blood vessels and connective tissue form a single functional unit. The diameter of the large vessels corresponds to the diameter of the arterioles and venules. A small number of arterioles come into contact with the pulp chamber through the apical foramen and additional canals. Inside the pulp, up to the area of the coronal pulp, large vessels form a central trunk-like node.

On the periphery of the root and coronal pulp, the branches of the arterioles form a dense capillary plexus, through which odontoblasts and other areas of the pulp are fully supplied with nutrients and oxygen.

The blood coming from the capillary plexus is collected in venous vessels with a lumen of increasing diameter. The largest venules are located in the center of the pulp, have a larger diameter of the lumen and their number is greater than that of arterioles.

Regardless of the peripheral capillary plexus, there are numerous arterio-venous anastomoses in the root and coronal pulp. A special role in the regulation of pulpal blood flow is assigned to direct connections between arterioles and venules, which help to eliminate the harmful effects of fluctuations in blood pressure on the pulp.

In addition to the circulatory system, there is a network of thin-walled lymphatic vessels of the pulp, which confirms the fundamental similarity of the shape and location of the lymphatic and blood vessels.

9.5 Pulp innervation

The innervation of the pulp is carried out by afferent nerve fibers that conduct exclusively painful sensations (A-delta fibers and C-fibers), as well as through the fibers of the autonomic nervous system, which regulate blood flow and transmit pain sensations.

A-delta fiberare myelin fibers formed from n. trigeminus, and are surrounded by Schwann cells.

C-fibersare non-myelinated fibers surrounded by separate and grouped Schwann cells. The number of nonmyelinated fibers in the pulp is four times greater than myelinated.

Nerve fibers, forming bundles with blood vessels, enter the pulp chamber through the apical opening. In the area of the root pulp, the fibers have almost no branches, in the coronal pulp they branch. In the peripheral marginal zone, nerve fibers lose the myelin sheath.

Below the cell-rich layer, a Rashkov plexus is formed, containing predominantly nonmyelinated nerve axons.

Located in the Rashkov plexus, some sensory fibers without myelin sheath inside Schwann cells reach the odontoblast layer.

In this area, the terminal axons also lose Schwann cells and, together with the processes of odontoblasts, reach the predentia.

Some fiber ends penetrate into the layer of mineralized dentin and in some cases reach the enamel-dentin border. The number of terminal branches in the area of the pulp horns increases, and in the root pulp, towards the apex, it gradually decreases.

Pulp tissue has four main functions of free connective tissue:

- plastic;
- trophic;
- regulator well;
- protective.

Plastic functionconsists in the formation of dentin from odontoblasts. The formation of primary dentin (ortho-dentin) and secondary dentin, which occurs throughout the entire period of tooth vitality, is physiologically determined. As a

result of the formation of secondary dentin, there is a gradual decrease in the volume of the pulp chamber and the lumen of the root canals.

In response to non-physiological irritation (for example, caries or pathological abrasion), odontoblasts form a tertiary protective dentin, which is an integral part of the protective reaction of the pulp-dentin complex to external stimuli. The formation of tertiary dentin always occurs at the site of exposure to pathological irritation. If, as a result of any damage, part of the layer of odontoblasts has died, then the pulp is always able to compensate for the defect with newly formed odontoblasts and.

With agethe regenerative capacity of the pulp is reduced. The layer of odontoblasts in the teeth of elderly patients is significantly thinned.

Age-related changes in pulp tissue include: a decrease in fibroblast density, an increase in the number of collagen fibers and a decrease in vascular density.

Acute focal pulpitis(filpitis acu1a focalis). Acute focal pulpitis is the initial stage of pulp inflammation, and its focus is usually localized in the area closest to the carious cavity. The duration of this stage does not exceed 2 days.

The patient complains of intense pain about? all types of irritants, In contrast to dental caries, which is also characterized by the appearance of pain from external stimuli of lesser strength and does not disappear after the removal of the irritant. Pain can occur spontaneously - without the influence of an apparent cause. The frequency and duration of pain attacks are variable: they can last 10-30 minutes, but in most cases no more than an hour. An attack of pain is replaced by a painless period lasting several hours. The patient usually correctly points out the tooth that bothers him, which indicates the absence of pain irradiation. At night, the pain is "usually" more intense.

On examination, there are usually no external changes on the face. Percussion is usually painless.

Differential diagnosis. Acute focal pulpitis must be differentiated from deep caries, acute diffuse and chronic fibrous pulpitis, and papillitis.

2- Practical lesson

Topic: Acute diffuse pulpitis. Clinic. Diagnostics and differential diagnostics.

Technological map of the practical lesson

Stages of work	Teacher	Student
1. Stages of preparation (10 minutes)	1. Controls the purity of the audience; 2. Checks the readiness of students for classes; 3. Controls attendance;	Listen
2.The introductory stage to classes (10 minutes)	1.Preparation on the topic of content; 2. Preparation of slides for the introductory report; 3. To develop the literature used for the study of the subject;	Write down the topic and listen
3.Main stage (135 minutes)	1. Dividing students into 2 small subgroups, asking questions on the topic; 2. Use of slides and multimedia; 3. Carries out medical work; 4. Combines all information on a given topic, actively the participating students are encouraged and appreciated;	Divided into small groups watching, participating, listening. The student expresses his opinion, complements and asks questions
4. Final stage (25 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listen Record Record

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9. The game continues in a new circle with the remaining students. Again, they are offered one new round of questions and again students are eliminated who, in total with the first rounds, have 2 minuses.
10. Round by round, the strongest participant in the game is selected, who answered the most questions.
11. On the sheet against each surname, the teacher registers - who dropped out in which round and became the "weak link".
12. The game is estimated at a maximum of 0.8 points.
students who dropped out after the first 2 rounds of answers receive "0" points for the game,
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14.In the lower free part of the journal, the teacher makes a note about the conduct of a business game, the headman signs.

15. The game protocol is saved.

Text

Acute focal pulpitis in 1-2 days turns into acute diffuse, in which the entire coronal pulp is involved in inflammation, and then the root pulp. With this form of pulpitis, serous inflammation quickly turns into serous-purulent, and then into purulent. In the first days (1-2 days), the patient complains of prolonged spontaneous pain with fairly long painless intervals. Cold provokes bouts of pain. Subsequently, as the transition into purulent inflammation, the painful attacks lengthen, and the "light" painless intervals become shorter and shorter. Sometimes the pain does not disappear completely, but only subsides, that is, it is wavy in nature. During this period, hot stimuli provoke and intensify pain, and cold can soothe, which is associated with a vasoconstrictor effect. The patient often cannot indicate the causative tooth. Irradiation of pain along the 5th pair of cranial nerves (in the ear, temple, eye, back of the head) is characteristic. Acute pulpitis lasts from 2 to 14 days.

On examination, the doctor sees a deep carious cavity. After necrosectomy, which is carried out with an excavator from the walls, since the walls of the carious cavity with pulpitis are painless, communication with the tooth cavity is not detected. Probing is painful all over the bottom. If purulent fusion of the coronal part occurs, then probing can be painless. Sometimes, when opening the cavity of the tooth cavity, a droplet of purulent exudate is released, and the patient feels relief. Percussion of the tooth is painful, which is explained by irritation of the periodontium and its involvement in the exudative process. The transitional fold in the area of the affected tooth is not changed. Finger pressure on the tooth does not cause pain, in contrast to acute forms of periodontitis, when the patient feels pain even when touching the tooth with his tongue. EOD - 30-45 μA.

Acute diffuse pulpitis must be differentiated from acute focal pulpitis, chronic forms of pulpitis in the stage of exacerbation, acute and chronic exacerbated periodontitis, trigeminal neuralgia, sinusitis, alveolitis pain in alveolitis, pericoronitis and difficult eruption of the wisdom tooth.

Differential diagnosisacute diffuse
and chronic exacerbated forms of pulpitis.

General:

1. spontaneous pain with "light" intervals, aggravated by temperature stimuli;
2. irradiation of pain;
3. comparative percussion is painful.

The differences are that with exacerbated forms of chronic pulpitis, there is:

1. in the anamnesis already had spontaneous pain;

2. when examining the carious cavity, a communication with the pulp chamber is found, which is painful when probing;

3.In 30% of cases, the radiograph reveals the expansion of the periodontal gap.

All these signs are absent in acute diffuse pulpitis. It should also be borne in mind that acute pulpitis occurs in people with a good reactivity of the body and with a compensated form of caries. Thus, we can conclude that in the practice of the dentist, chronic forms of pulpitis and their exacerbation are more common.

Differential diagnosis of acute diffuse pulpitis, acute apical periodontitis and chronic apical periodontitis in the acute stage.

General: prolonged pain.

Differences:

1. in acute diffuse pulpitis, the pain is periodic, and in acute forms of apical periodontitis it is constant, increasing in time, since there is an accumulation of exudate in the closed space of the periodontal gap, without "light" intervals;

2. with acute diffuse pulpitis, the tooth cavity is usually not opened, and with periodontitis there is a communication with the pulp chamber, painless when probing;

3. in acute with diffuse pulpitis, palpation along the transitional fold in the projection of the diseased tooth is painless, and in acute forms of periodontitis, it is painful;

4. in acute diffuse pulpitis, percussion can only be mildly painful, and in acute forms of periodontitis, it hurts to touch the tooth even with the tongue;

5. in acute diffuse pulpitis, the patient cannot accurately indicate a sick tooth due to irradiation of pain, in contrast to acute forms of periodontitis;

6. in acute diffuse pulpitis, temperature stimuli provoke pain, and in acute forms of periodontitis, there is no pain reaction to temperature stimuli;

7. on the roentgenogram in acute diffuse pulpitis, changes in the periodontium are not detected, and in acute forms of periodontitis (with the exception of acute periodontitis in the stage of intoxication), an expansion of the periodontal gap or destruction of bone tissue in the apex of the tooth root is revealed;

8.EOD indicators in acute diffuse pulpitis are always less than 100 μA, and in periodontitis - more than 100 μA.

Differential diagnosis

acute diffuse pulpitis and trigeminal neuralgia.

General: paroxysmal pain with "light" intervals.

Differences:

1.with neuralgia, chemical and cold (temperature) irritants, as a rule, do not provoke an attack of pain; pain arises from various movements of the muscles of the face and when you touch the "trigger" zones - the places where the branches of the trigeminal nerve exit;

2. with neuralgia, pain rarely occurs at night, in contrast to pulpitis;

3. As a result of the examination of the dentition, teeth that can give paroxysmal pain are not revealed.

If on this side there are teeth with carious cavities, under fillings or under crowns and deep periodontal pockets, then before diagnosing trigeminal neuralgia, it is necessary to conduct a thorough examination of the teeth and periodontium (survey, examination, percussion, probing, palpation, EDI, X-ray) with subsequent reorganization. Retrograde pulpitis in periodontal diseases, a carious cavity in a crowned tooth, a tooth with poorly performed endodontic treatment can lead to an erroneous diagnosis of trigeminal neuralgia.

Differential diagnosis

acute diffuse pulpitis and sinusitis.

General: aching pain in the jaw.

The differences are that with sinusitis:

1. the general condition suffers, a headache appears, fatigue, the temperature rises;

2. the pain intensifies when the head is tilted and the position changes abruptly;

3. there is discharge from the nose;

4. the radiographic picture of the maxillary sinuses is characteristic;

5. temperature irritants do not provoke pain in the teeth, there is a constant, diffuse, aching, moderate intensity pain.

Differential diagnosis

acute diffuse pulpitis and alveolar pain in alveolitis

General: pain radiating along the branches of the trigeminal nerve.

The differences are that with alveolitis:

1. there is always a socket of an extracted tooth with a disintegrated blood clot;

2. pains are permanent and are not associated with temperature stimuli;

3. palpation of the gums in the area of the hole is sharply painful;

4. after curettage of the hole and anti-inflammatory treatment, the pain goes away.

Differential diagnosis of acute diffuse pulpitis, pericoronaritis and difficult eruption of a wisdom tooth.

General: aching pain in the jaw.

The differences lie in the fact that when overcoronary and difficult teething of a wisdom tooth, the following is observed:

1. Difficulty opening the mouth (trismus);

2. painful palpation in this area of the gums;

3.the examination reveals an edematous inflamed gum in the projection of the wisdom tooth;

4. X-ray reveals a wisdom tooth in the eruption stage.

Treatment. All methods.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level

.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment

			tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfy flax "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
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ine .	55-60	Satisfy flax "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

3- Practical lesson

Topic: Chronic fibrous pulpitis. Clinic. Diagnostics...

Technological map of the practical lesson

Stages of work	Teacher	Student
1. Stages of preparation (10 minutes)	1. Controls the purity of the audience; 2. Checks the readiness of students for classes; 3. Controls attendance;	Listen

2.The introductory stage to classes (10 minutes)	1.Preparation on the topic of content; 2. Preparation of slides for the introductory report; 3. To develop the literature used for the study of the subject;	Write down the topic and listen
3.Main stage (135 minutes)	1. Dividing students into 2 small subgroups, asking questions on the topic; 2. Use of slides and multimedia; 3. Carries out medical work; 4. Combines all information on a given topic, actively the participating students are encouraged and appreciated;	Divided into small groups watching, participating, listening. The student expresses his opinion, complements and asks questions
4. Final stage (25 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listen Record Record

Questions on the topic:

Interactive method

USING THE WEAK LINK METHOD

To work you need:

1.Set of questions on the topic
2. A sheet of paper with a list of the group for keeping the protocol of the game.
3.Stopwatch.
Progress:

1. The game is conducted by a teacher and student assistant - a counter.
2. The counter on the sheet writes the date, group number, faculty, the name of the business game and the list of students in the group.
3. The teacher asks questions to students sequentially from a set of questions.
4. The student must in 5 seconds. give an answer.
5. The teacher evaluates the answer with the word “correct” or “incorrect”, if “incorrect” he himself gives the correct answer.

6. The counter puts “+” or “-” in front of the student's surname, depending on the correct answer.

7. Students pass 2 rounds of questions in this way.

8. After 2 rounds of questions, the game is suspended and the students who received 2 minuses are eliminated from the game as a "weak link".

9. The game continues in a new circle with the remaining students. Again, they are offered one new round of questions and again students are eliminated who, in total with the first rounds, have 2 minuses.

10. Round by round, the strongest participant in the game is selected, who answered the most questions.

11. On the sheet against each surname, the teacher registers - who dropped out in which round and became the "weak link".

12. The game is estimated at a maximum of 0.8 points.

students who dropped out after the first 2 rounds of answers receive "0" points for the game,

after 3 round of answers - "0.2" point,

after 4 round of answers - "0.4" point,

after 5 round of answers - "0.6" point

the strongest participant gets 0.8 points.

13. The points given on the protocol sheet are taken into account when calculating the current total of the lesson as an estimate for the theoretical part.

14.In the lower free part of the journal, the teacher makes a note about the conduct of a business game, the headman signs.

15. The game protocol is saved.

Text

Chronic fibrous pulpitis**(pulpitis chronica fibrosa)**

The transition of acute inflammation of the pulp into a chronic one often occurs after the communication of the carious cavity with the coronal cavity of the tooth is formed, through which the release of the inflammatory exudate is facilitated. However, the chronic course of pulpitis is sometimes observed in teeth in which the bottom of the carious cavity is dense, not perforated, and sometimes even covered with filling material. Thus, if the outflow of exudate is essential in the process of the transition of acute inflammation to chronic, then the leading role in this is probably played by the state of the patient's body, as well as the state of the pulp and the degree of virulence of bacteria.

Clinic... For chronic fibrous pulpitis, pain of lesser intensity is characteristic. Depending on the state of the pulp, spontaneous pain attacks are observed less often or are absent altogether. Prolonged aching pains arise only from stronger stimuli, mainly mechanical and temperature. Often, pain appears when inhaling cold air or

when the ambient temperature changes abruptly. Severe prolonged pain occurs when air is sucked out of the carious cavity, as well as when atmospheric pressure drops (for example, when flying at high altitudes). Objective symptoms. Before removing the softened dentin, and sometimes after removing it, when probing the bottom of the carious cavity, its communication with the tooth cavity is often found. When the probe is touched, the pulp is painful, bleeds profusely. In some cases, chronic fibrous pulpitis can occur when the tooth cavity is closed. When probing the bottom of the carious cavity in these cases, a layer of still relatively dense dentin can be found. As a rule, in chronic fibrous pulpitis, the sensitivity of the pulp is reduced to all types of irritants. If, in acute forms of pulpitis, a painful response to stimuli occurs immediately after their introduction into the carious cavity, then in chronic fibrous pulpitis a painful reaction arises, as it were, with some delay. At the same time, weak stimuli, for example, ether, introduced into the carious cavity, no longer cause a painful reaction. In these cases, it is usually necessary to apply a stronger stimulus, which is used as cold water introduced into the carious cavity on a cotton swab or on the area of the tooth neck. The electrical excitability of the pulp is reduced within the range of 20-40 μA. Radiographs sometimes reveal a rarefaction of bone tissue at the apex of the roots.

Differential diagnosis. Chronic fibrous pulpitis must be differentiated from deep caries, acute focal pulpitis, chronic gangrenous pulpitis. The distinction with deep caries is necessary for the reason that both with chronic fibrous pulpitis and with deep caries, a painful reaction to all types of stimuli occurs. However, if with deep caries the pain quickly calms down after the termination of the stimulus, then with chronic pulpitis it persists for some time. As already noted, there is a difference in the strength of the applied stimulus and the speed of the onset of the response. A tangible difference is obtained when determining the magnitude of the decrease in the electrical excitability of the pulp.

The uniformity of the response to stimuli necessitates differential diagnosis between chronic fibrous and acute focal pulpitis. A carefully collected anamnesis makes it possible to establish that chronic fibrous pulpitis lasts a longer period (several months, during which the process can be exacerbated repeatedly). As already indicated, acute focal pulpitis lasts only 2-3 days. Attacks of spontaneous pain are completely absent or more rarely; there is a significant difference in the pain response to stimuli of different strengths, in particular to electric current.

In chronic gangrenous pulpitis, as a rule, there are no spontaneous pains, the pain reaction often arises from strong stimuli, primarily from hot food. The cavity of the tooth in most cases is open, probing of the coronal pulp causes slight pain or painless, and then a painful reaction occurs only when the root needle is inserted into the root canal. The electrical excitability of the pulp is reduced to 40-90 μA.

Evaluation Criteria for Monitoring

	Progress in%	Grade	Student knowledge level

o.	and points		
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics.

			Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
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ine .	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

4- Practical lesson

Topic: Chronic hypertrophic pulpitis. Clinic. Diagnostics and differential diagnostics.

Technological map of the practical lesson

Stages of work	Teacher	Student
1. Stages of preparation (10 minutes)	1. Controls the purity of the audience; 2. Checks the readiness of students for classes; 3. Controls attendance;	Listen

2.The introductory stage to classes (10 minutes)	1.Preparation on the topic of content; 2. Preparation of slides for the introductory report; 3. To develop the literature used for the study of the subject;	Write down the topic and listen
3.Main stage (135 minutes)	1. Dividing students into 2 small subgroups, asking questions on the topic; 2. Use of slides and multimedia; 3. Carries out medical work; 4. Combines all information on a given topic, actively the participating students are encouraged and appreciated;	Divided into small groups watching, participating, listening. The student expresses his opinion, complements and asks questions
4. Final stage (25 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listen Record Record

Questions on the topic:

Interactive method

USING THE WEAK LINK METHOD

To work you need:

1.Set of questions on the topic
2. A sheet of paper with a list of the group for keeping the protocol of the game.
3.Stopwatch.
Progress:

1. The game is conducted by a teacher and student assistant - a counter.
2. The counter on the sheet writes the date, group number, faculty, the name of the business game and the list of students in the group.
3. The teacher asks questions to students sequentially from a set of questions.
4. The student must in 5 seconds. give an answer.
5. The teacher evaluates the answer with the word “correct” or “incorrect”, if “incorrect” he himself gives the correct answer.
6. The counter puts “+” or “-” in front of the student's surname, depending on the correct answer.

7. Students pass 2 rounds of questions in this way.

8. After 2 rounds of questions, the game is suspended and the students who received 2 minuses are eliminated from the game as a "weak link".

9. The game continues in a new circle with the remaining students. Again, they are offered one new round of questions and again students are eliminated who, in total with the first rounds, have 2 minuses.

10. Round by round, the strongest participant in the game is selected, who answered the most questions.

11. On the sheet against each surname, the teacher registers - who dropped out in which round and became the "weak link".

12. The game is estimated at a maximum of 0.8 points.

students who dropped out after the first 2 rounds of answers receive "0" points for the game,

after 3 round of answers - "0.2" point,

after 4 round of answers - "0.4" point,

after 5 round of answers - "0.6" point

the strongest participant gets 0.8 points.

13. The points given on the protocol sheet are taken into account when calculating the current total of the lesson as an estimate for the theoretical part.

14.In the lower free part of the journal, the teacher makes a note about the conduct of a business game, the headman signs.

15. The game protocol is saved.

Text

This form of chronic pulp inflammation often develops from chronic fibrous pulpitis. If the vault of the crown cavity of the tooth is destroyed by the carious process and the pulp is exposed in a large area, its surface is exposed to mechanical or other trauma. This leads to the proliferation of granulation tissue.

clinic... There are no spontaneous pains, sometimes a short and small pain attack occurs from mechanical stimuli (pressure of a solid food lump) or even from hot food. Patients note bleeding from the growth that has arisen, which occurs as a result of mechanical trauma to the granulation tissue.

Objective symptoms. The crown of the tooth is significantly destroyed. An overgrowth of granulation tissue protrudes from the carious cavity, bleeding from the touch of the probe. Superficial probing of the growth is painless, however, if the probe is advanced deep into the coronal pulp, a painful reaction occurs. Much less often, a dense pale pink formation is found in the carious cavity - a pulp polyp, which is formed after the coarse granulation tissue covers the epithelium from closely located areas of the gums.

Differential diagnosis. It is carried out with the growth of the gingival papilla or granulation tissue from the periodontal bifurcation (trifurcation) of the roots. The growth of the gingival papilla occurs as a result of trauma by its sharp edges of the carious cavity. To clarify the diagnosis, a probe is used, with the help of which, by passing along the outer edge of the carious cavity, it is possible to push back the overgrown gingival papilla. If the periodontium was the source of the proliferation of granulation tissue, then deep insertion of the probe is painless. On the roentgenogram, the rarefaction of bone tissue in the area of root convergence is determined; sometimes it is possible to determine the perforation of the bottom of the coronal cavity of the tooth.

Clinical picture

Chronic hypertrophic pulpitishas two clinical forms: granulating (growth of granulation tissue from the tooth cavity into the carious cavity) and pulp polyp - a later stage of the disease, when the overgrown pulp tissue is covered with oral epithelium. Epithelial cells are transferred from the gums, cover the entire surface of the bulging pulp and are tightly soldered to it.

Complaints:

- Aching pains from mechanical (when chewing) and sometimes temperature irritants;
- Overgrowth of "wild meat", bleeding during meals.

Anamnesis

Earlier, spontaneous pain may be noted, which then diminished or completely disappeared

Objectively:

Sounding:

- The tooth cavity is opened, the carious cavity is filled with an overgrown pulp polyp;
- Probing the polyp is not painful, but it bleeds heavily, probing the pulp in the tooth cavity is sharply painful;
- When examining the leg of the polyp with a probe or smoothing trowel, the leg goes into the tooth cavity.

The color of the polyp is initially bright red, then with a pulp polyp it has a pale pink color (the color of normal mucosa).

Percussion is painless

Palpation is painless

Thermal diagnostics - the reaction to temperature stimuli is not pronounced.

On the roentgenogram - a deep carious cavity communicating with the tooth cavity, changes in the periapical tissues and in the area of the interroot septum are not found.

Chronic hypertrophic pulpitismore common in children and adolescents.

Differential diagnosis of chronic hypertrophic pulpitis

Chronic hypertrophic pulpitisdifferentiate from:

1. hypertrophy of the interdental papilla;

2.growth of granulation tissue from the bifurcation, periodontium.

Differential diagnosis of chronic hypertrophic pulpitis with interdental papilla hypertrophy

General:

1.bleeding during eating in the area of the causative tooth;

2. the presence of a carious cavity;

3. overgrowth of soft tissue.

Differences:

1) the overgrown gingival papilla can be displaced by an instrument or a cotton ball from the carious cavity and its connection with the interdental gum can be detected, and the hypertrophic pulp grows from the perforation of the roof of the tooth cavity;

2) on the roentgenogram with pulpitis, you can see the message of the carious cavity with the tooth cavity.

Differential diagnosis of chronic hypertrophic pulpitis with the growth of granulation tissue from the bifurcation, periodontium

General:

1.the presence of granulation tissue protruding from the tooth cavity;

2. absence of spontaneous pain, spontaneous pain could be noted in the anamnesis;

3. the carious cavity communicates with the tooth cavity, there is an overgrown soft tissue;

4. the percussion is painless;

5. Probing is slightly painful or painless.

Differences:

1) probing in the area of perforation is less painful (like an injection into the gum) than in chronic hypertrophic pulpitis;

2) the level of perforation is most often located below the neck of the tooth, and in hypertrophic pulpitis - higher (at the level of the roof of the pulp chamber);

3) with the growth of granulation tissue from the bifurcation (trifurcation) in the presence of perforation in this area, as a rule, a complicated form of caries is revealed at different stages of treatment. Partial necrectomy reveals canal orifices previously filled or empty;

4) on the roentgenogram with chronic hypertrophic pulpitis, changes in the area of the interroot septum and periapical changes are not determined, in the presence of granulations from bifurcation in the hard tissues of the bottom of the tooth cavity - a focus of destruction of bone tissue in the area of bifurcation (interroot septum), in the presence of granulations originating from the periodontal , - the focus of destruction of bone tissue in the periapical tissues;

5) indicators of EDI from tubercles with pulpitis less, and with periodontitis more than 100 μA.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
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5- Practical lesson

Topic: Chronic gangrenous pulpitis. Clinic. Diagnostics. Differential diagnosis...

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3.Main stage (135 minutes)	1. Dividing students into 2 small subgroups, asking questions on the topic; 2. Use of slides and multimedia; 3. Carries out medical work; 4. Combines all information on a given topic, actively the participating students are encouraged and appreciated;	Divided into small groups watching, participating, listening. The student expresses his opinion, complements and asks questions
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Interactive method

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7. Students pass 2 rounds of questions in this way.

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11. On the sheet against each surname, the teacher registers - who dropped out in which round and became the "weak link".

12. The game is estimated at a maximum of 0.8 points.

students who dropped out after the first 2 rounds of answers receive "0" points for the game,

after 3 round of answers - "0.2" point,

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after 5 round of answers - "0.6" point

the strongest participant gets 0.8 points.

13. The points given on the protocol sheet are taken into account when calculating the current total of the lesson as an estimate for the theoretical part.

14.In the lower free part of the journal, the teacher makes a note about the conduct of a business game, the headman signs.

15. The game protocol is saved.

Text

Clinical picture

Complaints

• Bad breath;

• Slowly growing aching pains from hot, which do not stop after the action of the stimulus, a feeling of fullness in the tooth;

• May be asymptomatic;

• On discoloration (discoloration of the tooth)

Anamnesis

Earlier, spontaneous pain may be noted, which then diminished or completely disappeared.

Objectively:

Tooth color - the enamel has a gray tint.

The condition of the gingival mucosa is unchanged.

When probing, it is detected

• Deep carious cavity, with a wide-open tooth cavity;

• A large amount of softened dentin;

• Painful deep sounding in the mouth of the canal (depends on the degree of development of the process).

Percussion is painless.

Palpation is painless.

Thermal diagnostics - pain arises from a hot, long-lasting, slow increase in pain and its gradual extinction.

EOD 60-90 μA

Radiography is a deep carious cavity, widely communicated with the tooth cavity. there may be changes in the periapical tissues in the form of an expansion of the periodontal gap or even the formation of a focus of destruction of bone tissue in the area of the root apex.

Differential diagnosis of chronic gangreous pulpitis

Chronic gangrenous pulpitisdifferentiate from:

1.chronic fibrous pulpitis;

2. chronic apical periodontitis.

Differential diagnosis of chronic gangrenous pulpitisand chronic fibrous pulpitis

General:

1. pain from all types of irritants, which do not pass for a long time after their elimination, but in some cases there may be an asymptomatic course;

2. a history of spontaneous paroxysmal pain;

3. deep carious cavity communicates with the tooth cavity;

4. thermodiagnostics: the reaction to temperature stimuli does not go away for a long time after their elimination;

5. Percussion is painless.

Differences:

1.complaints in chronic fibrous pulpitis for aching pains from all types of irritants: with a sharp change in temperature, with inhalation of cold air, with chronic gangrenous pulpitis for aching pains from hot, which do not stop after the action of the stimulus, there is an unpleasant smell from the mouth;

2. the color of the tooth in chronic fibrous pulpitis is not changed, in chronic gangrenous pulpitis the enamel has a gray tint;

3. probing in chronic fibrous pulpitis is painful at the point of communication, the pulp is bleeding, in chronic gangrenous pulpitis painfully deep probing in the mouth of the canal (depends on the degree of development of the process);

4. thermodiagnostics in chronic fibrous pulpitis is painful from a cold stimulus, does not pass for a long time, in chronic gangrenous pulpitis it is painful from a hot stimulus, slowly increasing and just as slowly disappears;

5. EDI in chronic fibrous pulpitis 35-50 μA, in chronic gangrenous pulpitis 60-90 μA;

6. radiography in chronic fibrous pulpitis there may be changes in the periapical tissues in the form of an expansion of the periodontal gap (in 30% of cases), in chronic gangrenous pulpitis there may be changes in the periapical tissues in the form of an expansion of the periodontal sheath or even the formation of a focus of bone tissue destruction.

Differential diagnosis of chronic gangrenous pulpitis and chronic apical periodontitis

General:

1) sometimes asymptomatic (without exacerbation);

2. the patient may indicate severe pain in the past, which then diminished or completely disappeared;

3. Complaints about a putrid odor from a carious cavity;

4. significant destruction of the hard tissues of the tooth, the presence of a deep carious cavity, which communicates with the cavity of the tooth;

5. discoloration of the crown of the tooth;

6. the percussion is painless;

7. painless probing of the surface layers in the tooth cavity;

8. Changes in the radiograph in the periapical tissues.

Differences:

1.complaints in chronic gangrenous pulpitis of aching pains from various stimuli, mainly from hot ones, which do not pass after removal of the stimulus, with the pressure of a food lump on the tooth, bad breath, a feeling of fullness and "awkwardness" in the tooth; with chronic apical periodontitis, there are no pains from stimuli, asymptomatic course or complaints of swelling, sensitivity when biting;

2. the mucous membrane of the gums in chronic gangrenous pulpitis is unchanged, in chronic apical periodontitis there may be a fistula, a symptom of vasoparesis, a symptom of Marmass, a reflected blow, congestive hyperemia;

3. probing in chronic gangrenous pulpitis is painful in the mouth of the canal or in the depth of the canal, in chronic apical periodontitis it is painless;

4. thermodiagnostics in chronic gangrenous pulpitis - the reaction to temperature stimuli does not go away for a long time, in chronic apical periodontitis there is no reaction to temperature stimuli;

5. EDI in chronic gangrenous pulpitis 60-90 μA, in chronic apical periodontitis over 100 μA;

6. on the roentgenogram with chronic gangrenous pulpitis, it is possible to expand the periodontal gap or even a rarefaction focus (in 30% of cases), in chronic apical periodontitis, changes in the periapical tissues characteristic of one or another form of chronic periodontitis.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors.

			Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactorily "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactory "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine .	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

6- Practical lesson

Topic: Calculous pulpitis. Clinic. Diagnostics. Exacerbations of chronic pulpitis. Clinic. Diagnostics and differential diagnostics

Technological map of the practical lesson

Stages of work	Teacher	Student
1. Stages of preparation (10 minutes)	1. Controls the purity of the audience; 2. Checks the readiness of students for classes; 3. Controls attendance;	Listen
2.The introductory stage to classes (10 minutes)	1.Preparation on the topic of content; 2. Preparation of slides for the introductory report; 3. To develop the literature used for the study of the subject;	Write down the topic and listen
3.Main stage (135 minutes)	1. Dividing students into 2 small subgroups, asking questions on the topic; 2. Use of slides and multimedia; 3. Carries out medical work; 4. Combines all information on a given topic, actively the participating students are encouraged and appreciated;	Divide into small groups, watch, participate, listen. The student expresses his opinion, complements and asks questions
4. Final stage (25 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listen Record Record

Interactive method

USING THE WEAK LINK METHOD

To work you need:

1.Set of questions on the topic
2. A sheet of paper with a list of the group for keeping the protocol of the game.
3.Stopwatch.

Progress:

1. The game is conducted by a teacher and student assistant - a counter.

2. The counter on the sheet writes the date, group number, faculty, the name of the business game and the list of students in the group.

3. The teacher asks questions to students sequentially from a set of questions.

4. The student must in 5 seconds. give an answer.

5. The teacher evaluates the answer with the word “correct” or “incorrect”, if “incorrect” he himself gives the correct answer.

6. The counter puts “+” or “-” in front of the student's surname, depending on the correct answer.

7. Students pass 2 rounds of questions in this way.

8. After 2 rounds of questions, the game is suspended and the students who received 2 minuses are eliminated from the game as a "weak link".

9. The game continues in a new circle with the remaining students. Again, they are offered one new round of questions and again students are eliminated who, in total with the first rounds, have 2 minuses.

10. Round by round, the strongest participant in the game is selected, who answered the most questions.

11. On the sheet against each surname, the teacher registers - who dropped out in which round and became the "weak link".

12. The game is estimated at a maximum of 0.8 points.

students who dropped out after the first 2 rounds of answers receive "0" points for the game,

after 3 round of answers - "0.2" point,

after 4 round of answers - "0.4" point,

after 5 round of answers - "0.6" point

the strongest participant gets 0.8 points.

13. The points given on the protocol sheet are taken into account when calculating the current total of the lesson as an estimate for the theoretical part.

14.In the lower free part of the journal, the teacher makes a note about the conduct of a business game, the headman signs.

15. The game protocol is saved.

Denticle (calculus) is understood as a solid dentin-like substance located in the pulp. They can be considered as replacement (secondary) dentin.

-Denticles are a product of the activity of odontoblasts.

-Denticles by location distinguish:

1.Free lying 2.Prising 3.Interstitial.

-Interstitial denticles are located in the dentin itself.

- According to the organization of neoplasms, the following types of denticles are distinguished: 1. Actively formed, which in turn are divided into a) highly organized denticles, b) low-organized denticles
2. Passively organized - petrification of the intercellular substance of the pulp and calcification of blood vessels and nerves.
-Highly organized denticles are characterized by the presence of at least a small number of dentinal tubules.
-In low-organized denticles, dentinal tubules are almost completely absent, there is only a significant amount of fibrous formations.
- The pathogenesis of calculous pulpitis, as Astakhov pointed out, is certainly associated with tooth overload. In these cases, pathological abrasion of the chewing surfaces and overload of periodontal tissues are often encountered.
-The diagnosis of calculous pulpitis is made on the basis of the patient's complaints and additional examination methods (radiography).

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
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.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of

			the issue. Knows, tells confidently. Has an accurate idea.
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.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
	61-65	Satisfactory "3"	Has an incomplete understanding of

ig ht.			the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine .	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

7- Practical lesson

Theme: Anesthetics used in therapeutic dentistry. Methods and technique of carrying out.

Technological map of the practical lesson

Stages of work	Teacher	Student
1. Stages of preparation (10 minutes)	1. Controls the purity of the audience; 2. Checks the readiness of students for classes; 3. Controls attendance;	Listen
2.The introductory stage to classes (10 minutes)	1.Preparation on the topic of content; 2. Preparation of slides for the introductory report; 3. To develop the literature used for the study of the subject;	Write down the topic and listen
3.Main stage (135 minutes)	1. Dividing students into 2 small subgroups, asking questions on the topic; 2. Use of slides and multimedia; 3. Carries out medical work; 4. Combines all information on a given topic, actively the participating students are encouraged and appreciated;	Divided into small groups watching, participating, listening. The student expresses his opinion, complements and asks

		questions
4. Final stage (25 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listen Record Record

Interactive method

USING THE WEAK LINK METHOD

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Progress:

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2. The counter on the sheet writes the date, group number, faculty, the name of the business game and the list of students in the group.

3. The teacher asks questions to students sequentially from a set of questions.

4. The student must in 5 seconds. give an answer.

5. The teacher evaluates the answer with the word “correct” or “incorrect”, if “incorrect” he himself gives the correct answer.

6. The counter puts “+” or “-” in front of the student's surname, depending on the correct answer.

7. Students pass 2 rounds of questions in this way.

8. After 2 rounds of questions, the game is suspended and the students who received 2 minuses are eliminated from the game as a "weak link".

9. The game continues in a new circle with the remaining students. Again, they are offered one new round of questions and again students are eliminated who, in total with the first rounds, have 2 minuses.

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12. The game is estimated at a maximum of 0.8 points.

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after 5 round of answers - "0.6" point

the strongest participant gets 0.8 points.

13. The points given on the protocol sheet are taken into account when calculating the current total of the lesson as an estimate for the theoretical part.

14.In the lower free part of the journal, the teacher makes a note about the conduct of a business game, the headman signs.

15. The game protocol is saved.

Text

Modern doctors practice different types of anesthesia in dentistry. Anesthesia is divided into general, local and combined. Local anesthesia involves anesthesia only at a specific site in which manipulations will be performed. A small area is determined in which the sensitivity of the nerve endings is removed with the help of the administration of medications. Local anesthesia, in turn, is divided into several types. Application anesthesia (also called surface anesthesia) is used when surface anesthesia is required. It is carried out without using a syringe. The doctor applies the anesthetic drug to the area that requires pain relief using the applicator. Sometimes an aerosol is also used in this case. In this case, only a few millimeters of tissue are anesthetized.

Infiltration anesthesia- This is anesthesia, in which the appropriate drugs are injected using a syringe. In this case, the soft tissues are impregnated with an anesthetic. This type of pain relief is practiced by modern dentists very often, since the procedure is well tolerated by patients and at the same time allows you to effectively relieve a person of pain.

Conductive anesthesia in dentistry enables the doctor to relieve the patient of pain over a relatively large area. For example, half of the jaw can be numbed in this way. This method is best suited for major operations, and is also practiced if complications arise after treatment that require urgent intervention. This procedure is distinguished by a more complex execution technique.

Doctors practice all the methods described taking into account the individual characteristics of the patient, disease, etc. Thus, during pregnancy in a woman, the dentist always uses the most gentle method of local anesthesia.

At the same time, the disadvantage of local anesthesia is, first of all, that the sensitivity of the nerve endings disappears only for a relatively short period of time. As a consequence, this method can be used if the doctor is treating one tooth. But if several teeth are damaged and, accordingly, the need to treat them immediately, you have to practice other methods.

As a side effect of this method, there is sometimes a rapid heartbeat or fluctuations in blood pressure. This occurs under the influence of adrenaline, which is part of anesthetics with the aim of vasoconstriction.

Anesthesia techniqueis detailed in textbooks and manuals on dental anesthesiology and dental surgery, so we will focus on just a few points. As our clinical experience shows, with the use of carpulated anesthetics based on articaine, infiltration anesthesia in both the upper and lower jaw is sufficient for therapeutic dental interventions in most cases. To the conductoranesthesiaon the lower jaw

(torusal, mandibular), we resort only when it is necessary to anesthetize a large area of the dentoalveolar system (for example, with simultaneous depulpation of 3-4 teeth, surgical intervention on the periodontium of 1-2 segments of the dentition, etc.).

Таблица 5

Состав, свойства и показания к применению местных анестетиков

Состав	Препарат, фирма-производитель	Свойства, показания к применению
Артикаина гидрохлорид 4% Адреналин 1:100 000	**Ultracain D-S forte**, Aventis; **Ubistesin forte**, 3M ESPE; **Septanest 1:100 000**, Septodont **Primacaine Adrenalinee 1/100 000**, Pierre Rolland	***Основной анестетик для применения в терапевтической стоматологии***. Время наступления анестезии 1–3 минуты. Длительность анестезии 60–75 минут. Глубокий обезболивающий эффект. Хорошее проникновение в костную ткань. Низкий риск аллергических реакций. *Показания к применению:* проводниковая и инфильтрационная анестезия при удалении зубов, операциях на альвеолярном отростке, препарировании кариозных полостей, витальной экстирпации пульпы
Артикаина гидрохлорид 4% Адреналин 1:200 000	**Ultracain D-S**, Aventis; **Ubistesin**, 3M ESPE; **Septanest 1:200 000**, Septodont **Primacaine Adrenalinee 1/200 000**, Pierre Rolland	***Анестетик выбора в терапевтической стоматологии***. Время наступления анестезии 1–3 минуты. Длительность анестезии 30–45 минут. Обезболивающий эффект, достаточный для проведения большинства лечебных манипуляций. Хорошее проникновение в костную ткань.

Таблица 5 (окончание)

Состав	Препарат, фирма-производитель	Свойства, показания к применению
		Низкий риск аллергических реакций. *Показания к применению*: проводниковая и инфильтрационная анестезия при препарировании зубов, нетравматичных и непродолжительных хирургических вмешательствах. Проведение анестезии детям, беременным женщинам, пациентам «групп риска»
Мепивакаина гидрохлорид 3%	**Mepivastesin**, 3M ESPE; **Scandonest 3% sans vasoconstricteur**, Septodont	***Местные анестетики для пациентов «групп риска»***. Время наступления анестезии 1–3 минуты. Длительность анестезии 10–20 минут.
Артикаина гидрохлорид 4%	**Ultracain D**, Aventis	Мягкий обезболивающий эффект, достаточный для проведения кратковременных и нетравматичных лечебных манипуляций. Низкий риск побочных эффектов и аллергических реакций (не содержит сульфиты, ЭДТА и парабены). Показания к применению: проведение анестезии пациентам, которым противопоказано применение анестетиков с вазоконстрикторами (гипертония, сахарный диабет, коронарная недостаточность и т.д.). При опасности аллергической реакции на сульфиты и ЭДТА. Может применяться у всех пациентов при кратковременных и нетравматичных лечебных манипуляциях

Injection anesthesia is usually painful, especially when the needle is punctured and advanced through the tissues. This causes the patient to feel discomfort and fear of dental manipulation (for example, with subsequent injections in children). In such cases, we recommend using a three-stage anesthesia. At the first stage, a local anesthetic (for example, Ultracare gel, Ultradent) is applied at the site of the future injection of the needle for 1 - 1.5 minutes. The second stage is submucous (submucous) administration of 0.2-0.3 ml of anesthetic solution. The third stage - after 1-2 minutes - subperiosteal or ingraligamentary administration of anesthetic solution. The proposed method, although it takes a little longer than the traditional

one, is, in our opinion, more preferable for its implementation, as it allows you to reduce pain to a minimum. The use of the VibraJect device (see Fig. 25) allows to reduce the patient's pain during anesthesia. This device is a syringe attachment for carpool anesthesia. When the VibraJect is turned on, it generates vibration, which during the injection is transmitted to the syringe, injection needle and tissue into which the anesthetic is injected. As the literature data and our own clinical experience show, the use of VibraJect can significantly reduce the painfulness of anesthesia, reduce the negative impressions and fear of the patient associated with injecting anesthesia. The mechanism of the pain-relieving action of VibraJect is to block the pain signal in accordance with the theory of the pain gate. The main point of this theory is thatnervous systemto reach its central departments. Impulses passing through thick ("tactile") fibers can "close the gate". When large-diameter nerve fibers are activated, impulses arriving through small-diameter nociceptive fibers are “at the closed gate” of the pain pathway. That is, the pain that occurs in the tissues is reduced by counter-irritation: mechanical rubbing of the skin surface or the use of irritating ointments (Barr, Kiernan, 1988), the use of high-frequency, low-intensity electrical stimulation (Wall, Sweet, 1967), known as transcutaneous electroneurostimulation (TENS) , or vibration stimulation (Lunderberg, 1983). It is on the vibration stimulation of tactile fibers that the action of "VibraJect" is based.

The most effective use of this device when carrying out the most painful types of anesthesia: infiltration, palatal, incisal, mandibular, and intraligamentary. Moreover, as our clinical experience shows, the best effect is achieved when a vibrating injection needle contacts the bone. To avoid deformation of the needle tip and tissue injury, when the needle moves along the cortical plate of the bone, the needle section should be directed towards the bone surface (Fig. 26). The introduction of a local anesthetic drug into the lumen of a blood vessel can lead to complications associated with the general toxic effect of the anesthetic and vasoconstrictor (toxic reaction).

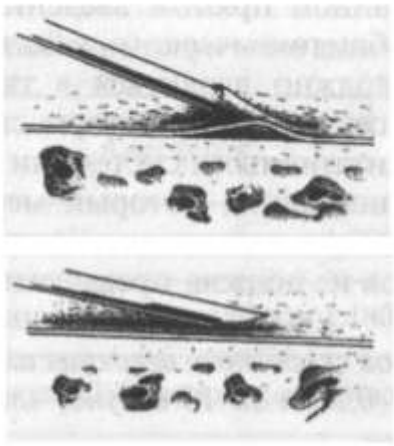

Рис. 26. Положение среза иглы при проведении инъекционной анестезии.

In order to avoid intravascular administration of a local anesthetic drug, an aspiration test must be carried out completely during injection anesthesia. For this purpose, after the needle is injected into the fabric, pull the plunger slightly in the opposite direction. The appearance of blood in the carpule indicates that the needle is in the lumen of a blood vessel. In the event of a scrap, the needle is withdrawn back 2-5 mm, slightly changed its direction and reinserted into the tissue. After repeated aspiration test, the anesthetic is injected into the tissues. To carry out an aspiration test, in order to ensure the reverse movement of the rubber piston in the cartridge, special fixtures of various shapes are made on the piston of the cartridge syringe (Fig. 27). We consider the most successful and versatile design of the latch in the form of a corkscrew. It is also recommended to maintain a safe injection rate. Different sources provide different recommendations for a complete question.

Рис. 27. Варианты фиксаторов на поршне для проведения аспирационной пробы.

To prevent articaine from having a general toxic effect when accidentally injected directly into the bloodstream, the contents of the capsule (1.7 ml) should be injected into the tissues no faster than within 20-25 seconds (corresponds to the rate of inactivation of articaine by enzymatic blood systems). Drugs based on mepivacaine, which is metabolized in the liver, should be administered even more slowly. The rate of administration of these drugs should not exceed 1 ml per minute. Thus, the optimal rate of administration of the anesthetic drug is considered to be 0.5 ml in 15 seconds, which corresponds to 1 minute for the carpula. In addition, the slow

administration of the anesthetic prevents pain at the injection site as a result of tissue damage that occurs with the rapid administration of the drug. The maximum permissible dose of local anesthetic should also not be exceeded (Table 6). When carrying out anesthesia, you should strictly observe the sanitary and hygienic requirements. The syringe must be sterile. The protective caps from the needle must be removed immediately before injection. The top of the carpula (metal stopper with a rubber membrane) should be treated with a swab moistened with alcohol. It is forbidden to reuse the cartridge with the remains of the anesthetic solution to another patient, even when changing the needles! Even if no blood is visible in the carpule, the risk of cross transmission of infection (AIDS, viral hepatitis, etc.) in case of reuse of the carpula is very high (about 100%). This is due to the fact that, due to the elasticity of the rubber plug-piston, after the initial injection of the anesthetic and the cessation of pressure, microscopic particles of blood and tissues invisible to the eye are self-aspirated into the carpula. Nevertheless, this amount is sufficient for the transmission of infection from one patient to another. Before carrying out injection anesthesia, the patient should be informed about the possible temporary loss of sensitivity and dysfunction of some muscles of the face. language. For this period, he is advised to avoid chewing hard food in order to prevent possible biting of the lips, tongue, mucous membrane of the cheeks in the area that has “lost” sensitivity. Despite the fact that the negative effect of anesthesia on the ability to concentrate has not been proven, special care is required when driving vehicles after anesthesia and a dentist appointment (stressful situation). In addition, on this day, the patient is advised to avoid work at heights, at rotating mechanisms and other activities associated with the need for increased attention and quick reaction.

Таблица 6

Максимально допустимые дозы стоматологических анестетиков

Анестетик	Максимально допустимая доза
Артикаин 4% с адреналином 1:200 000	7 карпул
Артикаин 4% с адреналином 1:100 000	7 карпул
Мепивакаин 3% без вазоконстриктора	5 карпул
1 карпула = 1,7 мл	
Внимание! Не рекомендуется превышать половины максимальной дозы!	

Thus, the sequence of actions of a doctor during injection anesthesia with a carpool anesthetic is as follows:

1. Preparatory stage: examination of the patient, diagnosis, obtaining informed consent for medical procedures.
2. Treatment of the top of the carpula (metal stopper with a rubber membrane) with a swab moistened with alcohol.
3. Placement of the cartridge in a sterile syringe.
4. Insertion of the piston retainer into the rubber plug of the cartridge. Fixation control: when the piston rotates, the carpula inside the syringe rotates with it.
5. The introduction and fixation of the needle (on the thread).
6. Removing the shchitny cap from the needle, checking the readiness of the syringe: when you press the plunger, a drop of anesthetic solution should appear at the tip of the needle.
7. Preparation of the needle injection site (treatment with antiseptic and local anesthetic drugs).
8. Inserting the needle into the fabric.
9. Carrying out an aspiration test.
10. Conducting anesthesia.
11. Pause for 1-3 minutes to monitor the patient's condition and the onset of anesthesia.
12. Carrying out medical manipulations.
13. Control of the general condition and recommendations to the patient.

When providing dental care to pregnant women, a number of additional rules must be followed. Routine interventions should be performed between the third and sixth months of pregnancy. When scraping, it is necessary to first consult the patient with an anesthesiologist and obstetrician-gynecologist to exclude extragenital pathology and pathology of pregnancy. For the purpose of premedication, it is allowed to use drugs of the benzodiazepine series (in a lower dosage in agreement with the obstetrician-gynecologist). In addition, when admitting a pregnant patient, it is important to adhere to the medical and protective regime and the rules of medical ethics and deontology. Injection anesthesia for pregnant women is carried out with drugs based on articaine (practically does not penetrate the placental barrier) with a vasoconstrictor content of 1: 200,000. that the placental barrier is formed by the 14-16th week of pregnancy, and before this period the use of any medications by a pregnant woman, including local anesthetics, should be minimized and carried out only on urgent grounds. In addition, in order to avoid disturbances in the blood supply to the fetus, treatment should be carried out while the patient is seated; it is not recommended to treat pregnant women in the lying position. When conducting anesthesia in elderly patients with concomitant general somatic diseases in a compensated form, preference should be given to anesthetics based on a 4% solution of articaine with an adrenaline concentration of 1: 200,000, for example, Ubistezin or

Septanest 1: 200,000. and before this period, the use of any medications by a pregnant woman, including local anesthetics, should be minimized and carried out only on urgent grounds. In addition, in order to avoid disturbances in the blood supply to the fetus, treatment should be carried out while the patient is seated; it is not recommended to treat pregnant women in the lying position. When conducting anesthesia in elderly patients with concomitant general somatic diseases in a compensated form, preference should be given to anesthetics based on a 4% articaine solution with an adrenaline concentration of 1: 200,000, for example, Ubistezin or Septanest 1: 200,000. and before this period, the use of any medications by a pregnant woman, including local anesthetics, should be minimized and carried out only on urgent grounds. In addition, in order to avoid disturbances in the blood supply to the fetus, treatment should be carried out while the patient is seated; it is not recommended to treat pregnant women in the lying position. When conducting anesthesia in elderly patients with concomitant general somatic diseases in a compensated form, preference should be given to anesthetics based on a 4% articaine solution with an adrenaline concentration of 1: 200,000, for example, Ubistezin or Septanest 1: 200,000. the treatment should be carried out with the patient in a seated position; it is not recommended to treat pregnant women in the lying position. When conducting anesthesia in elderly patients with concomitant general somatic diseases in a compensated form, preference should be given to anesthetics based on a 4% articaine solution with an adrenaline concentration of 1: 200,000, for example, Ubistezin or Septanest 1: 200,000. the treatment should be carried out with the patient in a seated position; it is not recommended to treat pregnant women in the lying position. When conducting anesthesia in elderly patients with concomitant general somatic diseases in a compensated form, preference should be given to anesthetics based on a 4% articaine solution with an adrenaline concentration of 1: 200,000, for example, Ubistezin or Septanest 1: 200,000.

In some cases, general anesthesia - anesthesia - is used for oral cavity sanitation. This type of pain relief in outpatient therapeutic dentistry has limited use. This is because the medical risk of anesthesia outweighs the risk of dental surgery. Indications for the treatment of dental diseases (including caries) under anesthesia are: - intolerance or ineffectiveness of local anesthetics; - the need to simultaneously carry out a large amount of painful dental procedures; - the state of the patient's nervous system, which makes it difficult for the doctor to contact him; - the patient's insurmountable fear of dental manipulations; - the patient's desire. It should be borne in mind that with general anesthesia at the doctor, the time for carrying out medical manipulations is minimized, Therefore, we recommend that only painful interventions be carried out under anesthesia (for example, preparation of carious

cavities, pulp extirpation), and the filling is postponed for subsequent visits. This approach is especially justified when using labor-intensive techniques that require significant time-consuming (endodoptic treatment, filling with light-cured composites, etc.). Other methods of anesthesia (application anesthesia, electrical anesthesia, audio analgesia, anesthesia by acting on acupuncture points, hypnosis, etc.) have not become widespread in therapeutic dentistry due to their complexity or insufficient effectiveness. This approach is especially justified when using labor-intensive techniques that require significant time-consuming (endodoptic treatment, filling with light-cured composites, etc.). Other methods of anesthesia (application anesthesia, electrical anesthesia, audio analgesia, pain relief by acting on acupuncture points, hypnosis, etc.) have not become widespread in therapeutic dentistry due to their complexity or insufficient effectiveness. This approach is especially justified when using labor-intensive techniques that require significant time consumption (endodoptic treatment, filling with light-cured composites, etc.). Other methods of anesthesia (application anesthesia, electrical anesthesia, audio analgesia, pain relief by acting on acupuncture points, hypnosis, etc.) have not become widespread in therapeutic dentistry due to their complexity or insufficient effectiveness.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.

.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactory "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine .	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.

en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

8- Practical lesson

Topic: Biological method of pulpitis treatment. Indications. Technique of carrying out. Errors and complications...

Technological map of the practical lesson

Stages of work	Teacher	Student
1. Stages of preparation (10 minutes)	1. Controls the purity of the audience; 2. Checks the readiness of students for classes; 3. Controls attendance;	Listen
2.The introductory stage to classes (10 minutes)	1.Preparation on the topic of content; 2. Preparation of slides for the introductory report; 3. To develop the literature used for the study of the subject;	Write down the topic and listen
3.Main stage (135 minutes)	1. Dividing students into 2 small subgroups, asking questions on the topic; 2. Use of slides and multimedia; 3. Carries out medical work; 4. Combines all information on a given topic, actively the participating students are encouraged and appreciated;	Divided into small groups watching, participating, listening. The student expresses his opinion, complements and asks questions
4. Final stage (25 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listen Record Record

Interactive method

USING THE WEAK LINK METHOD

To work you need:

1.Set of questions on the topic

2. A sheet of paper with a list of the group for keeping the protocol of the game.

3.Stopwatch.

Progress:

1. The game is conducted by a teacher and student assistant - a counter.

2. The counter on the sheet writes the date, group number, faculty, the name of the business game and the list of students in the group.

3. The teacher asks questions to students sequentially from a set of questions.

4. The student must in 5 seconds. give an answer.

5. The teacher evaluates the answer with the word “correct” or “incorrect”, if “incorrect” he himself gives the correct answer.

6. The counter puts “+” or “-” in front of the student's surname, depending on the correct answer.

7. Students pass 2 rounds of questions in this way.

8. After 2 rounds of questions, the game is suspended and the students who received 2 minuses are eliminated from the game as a "weak link".

9. The game continues in a new circle with the remaining students. Again, they are offered one new round of questions and again students are eliminated who, in total with the first rounds, have 2 minuses.

10. Round by round, the strongest participant in the game is selected, who answered the most questions.

11. On the sheet against each surname, the teacher registers - who dropped out in which round and became the "weak link".

12. The game is estimated at a maximum of 0.8 points.

students who dropped out after the first 2 rounds of answers receive "0" points for the game,

after 3 round of answers - "0.2" point,

after 4 round of answers - "0.4" point,

after 5 round of answers - "0.6" point

the strongest participant gets 0.8 points.

13. The points given on the protocol sheet are taken into account when calculating the current total of the lesson as an estimate for the theoretical part.

14.In the lower free part of the journal, the teacher makes a note about the conduct of a business game, the headman signs.

15. The game protocol is saved.

Text

Method of complete preservation of pulp (biological).

Indicationto the use of the method of complete preservation of the pulp are accidental exposure of the pulp and acute focal pulpitis.

Contraindicatedthe use of a biological method for the treatment of pulpitis in patients over 40 years old; in the presence of diseases such as hypertension, atherosclerosis, diabetes, vitamin deficiency, etc.; if the patient has periodontitis or periodontal disease; localization of the carious cavity in the area of the tooth neck; a decrease in the electric excitability of the tooth by more than 25 μA; destructive changes in the periapical tissues; the need to cover the tooth in the near future with an artificial crown; using it to fix the prosthesis.

To preserve the pulp in the biological method of treating pulpitis, the most widespread are pastes containing pain relievers, antiseptics, broad-spectrum antibiotics, corticosteroids, as well as enzymes and calcium hydroxide. The leading place among the listed funds is occupied by calcium hydroxide, which has antimicrobial, anti-inflammatory and odontotropic properties.

Treatment method. The softened dentin is removed from the carious cavity with an excavator, the cavity is treated with a sharp bur, avoiding overheating of the hard tooth tissues. To exclude infection of the pulp, the preparation is carried out in layers, and when approaching the pulp, the boron is changed to sterile. An important condition that must be observed during preparation is also the protection of the carious cavity and the cavity of the tooth from the ingress of saliva into them.

It was found that through dense layers of dentin medicinal substances easily diffuse into the pulp. Therefore, in order to avoid her injury during the biological method, pulp exposure can be omitted.

The carious cavity is washed with warm 0.9% sodium chloride solution, 0.5% novocaine solution in combination with antibiotics, enzymes or antiseptics. V

In recent years, for the purpose of antiseptic treatment of the carious cavity in the treatment of pulpitis by the biological method, 0.02% chlorhexidine solution has been successfully used. This drug has a pronounced antibacterial property and does not have a damaging effect on the dental pulp. The treated carious cavity is dried with dry sterile tampons (alcohol and ether cause additional irritation of the pulp). Then the bottom of the treated cavity is covered with a hardening paste of odontotropic action (calmecin, calcin, etc.). Frequent and repeated dressing changes do not exclude the possibility of injury and secondary infection of the dental pulp.

If in doubt about the diagnosis of pulpitis, it is advisable to leave either a tampon soaked in a solution of chlorhexidine, an enzyme, glucocorticoid, or a paste with these drugs under a bandage made of artificial dentin. In case of clinical well-being, on the second or third visit, the tooth is finally filled with a calcium-containing or other odontotropic paste applied to the bottom of the cavity. Drugs can be reapplied if

the pain is less intense. In case of increased pain after double application of the therapeutic paste, you should abandon the use of this technique.

Simultaneously with the application of the therapeutic paste at the same visit, you can assign a session of microwave therapy to the area of periapical tissues (2 W for 3 minutes). The procedure is repeated on the second visit after the permanent filling has been applied.

Clinical criteria for a favorable outcome of the treatment of pulpitis with a biological method are the absence of pain, the indices of electrical excitability of the tooth pulp lying within the normal range, and in the long term, the absence of changes in the periodontal gap on the roentgenogram.

In addition to calcium hydroxide, corticosteroids, which have anti-inflammatory properties, have also been found to be effective in preserving the pulp. Prolonged contact of corticosteroids with the pulp is undesirable due to their ability to reduce dentinogenesis. Therefore, corticosteroids are applied to the inflamed pulp in the first visit to the patient for 2-3 days in order to relieve the inflammatory process. Before applying a permanent filling on the second visit, the corticosteroid pad must be replaced with an odontotropic paste. In addition to calcium-containing preparations, odontotropic properties are possessed by collagen paste, bone meal, lysozyme-vitamin paste, and hyaluronic acid preparations.

Complications and their elimination... When using the method of complete or partial preservation of the pulp, the following complications are possible.

1. Increased pain after the application of a medical paste, temporary or permanent filling. This complication may be associated with errors in diagnosis, non-observance of the rules of asepsis, incomplete removal of softened and pigmented dentin, insufficient isolation of the tooth from saliva, rough and traumatic preparation of the carious cavity, use

alcohol and ether for the treatment of a carious cavity. It is recommended to replace the preparation for the medicinal pad or to partially remove the pulp (if a biological method was used).

If there is no effect, they abandon the attempt to preserve the pulp of the tooth and switch to extirpation methods of treating pulpitis.

2. Bleeding that occurs after removal of the coronal pulp and diathermocoagulation during the vital amputation method is eliminated by repeated diathermocoagulation, by applying a hemostatic sponge or oxycellodex to the root canal orifices.

3.Allergic reaction to the use of an anesthetic or a drug that is part of the therapeutic paste. To prevent this complication, you should more carefully collect an allergic history, identify risk factors.

Treatment depends on the form of manifestation of an allergic reaction, is carried out according to the developed schemes, includes desensitizing therapy, according to indications - the administration of drugs to increase blood pressure and stimulate cardiac activity and respiration, to relieve bronchospasm, coronary spasm, anti-shock drugs, drugs for sedation and destruction penicillin, etc.

4.After partial removal of the pulp, pain occurs from temperature stimuli. The reason may be incomplete removal of pulp from the canal orifices. Remaining pulp must be removed.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.

.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
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ine .	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
..	54 and below	Unsatisfactor y 2 "	Has no exact idea. Does not know.

9- Practical lesson

Theme: Methods for treating pulpitis with vital amputation. Indications. Technique of carrying out.

Technological map of the practical lesson

Stages of work	Teacher	Student

1. Stages of preparation (10 minutes)	1. Controls the purity of the audience; 2. Checks the readiness of students for classes; 3. Controls attendance;	Listen
2.The introductory stage to classes (10 minutes)	1.Preparation on the topic of content; 2. Preparation of slides for the introductory report; 3. To develop the literature used for the study of the subject;	Write down the topic and listen
3.Main stage (135 minutes)	1. Dividing students into 2 small subgroups, asking questions on the topic; 2. Use of slides and multimedia; 3. Carries out medical work; 4. Combines all information on a given topic, actively the participating students are encouraged and appreciated;	Divided into small groups watching, participating, listening. The student expresses his opinion, complements and asks questions
4. Final stage (25 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listen Record Record

Interactive method

USING THE WEAK LINK METHOD

To work you need:

1.Set of questions on the topic
2. A sheet of paper with a list of the group for keeping the protocol of the game.
3.Stopwatch.
Progress:

1. The game is conducted by a teacher and student assistant - a counter.

2. The counter on the sheet writes the date, group number, faculty, the name of the business game and the list of students in the group.

3. The teacher asks questions to students sequentially from a set of questions.

4. The student must in 5 seconds. give an answer.

5. The teacher evaluates the answer with the word “correct” or “incorrect”, if “incorrect” he himself gives the correct answer.

6. The counter puts “+” or “-” in front of the student's surname, depending on the correct answer.

7. Students pass 2 rounds of questions in this way.

8. After 2 rounds of questions, the game is suspended and the students who received 2 minuses are eliminated from the game as a "weak link".

9. The game continues in a new circle with the remaining students. Again, they are offered one new round of questions and again students are eliminated who, in total with the first rounds, have 2 minuses.

10. Round by round, the strongest participant in the game is selected, who answered the most questions.

11. On the sheet against each surname, the teacher registers - who dropped out in which round and became the "weak link".

12. The game is estimated at a maximum of 0.8 points.

students who dropped out after the first 2 rounds of answers receive "0" points for the game,

after 3 round of answers - "0.2" point,

after 4 round of answers - "0.4" point,

after 5 round of answers - "0.6" point

the strongest participant gets 0.8 points.

13. The points given on the protocol sheet are taken into account when calculating the current total of the lesson as an estimate for the theoretical part.

14.In the lower free part of the journal, the teacher makes a note about the conduct of a business game, the headman signs.

15. The game protocol is saved.

Text

The method of vital pulp amputation should be considered as a kind of biological method for the treatment of pulpitis, in which the viability of only the root part of the pulp of a multi-rooted tooth is preserved, the electroexcitability indices of which are in the range of 30-40 μA.

Indicationsfor vital amputation are: failure of the biological method, acute serous-purulent pulpitis, chronic hypertrophic, chronic fibrous pulpitis, calculous pulpitis, traumatic pulpitis; with damage to the coronal pulp, as well as the localization of the carious cavity, which prevents the biological method of treating pulpitis (cervical and proximal surfaces of the teeth).

Contraindicationare all other forms of pulpitis.

Vital pulp amputation can be performed in somatically healthy people up to 45 years old in the absence of pathological changes in periodontal tissues.

Methodology of carrying out. The indispensable conditions for the success of treatment are strict adherence to the rules of asepsis and antiseptics (the use of a rubber dam, treatment of the surgical field, the use of sterile burs and cotton balls, etc.), as well as adequate anesthesia using anesthetics without the addition of adrenaline.

Changing burs, carefully dissect the carious cavity, trying to completely remove the softened dentin. It is recommended to amputate the coronal pulp with a sharp excavator. The mouth of the canals must be additionally processed with a small reverse conical bur, creating a platform at the mouth of the root canal that protects the stump of the root pulp from the pressure of the therapeutic paste. To stop bleeding, use solutions of hydrogen peroxide, "Racetipine", "Katalyugem", liquid "EndoZhi" hemostatic, etc.

It is also possible to use point diathermocoagulation at a current strength of 40-50 μA (Ivanov BC, Urbanovich L.I., Berezhnoy V.P., 1990).

On the pulp stump without pressure, a healing paste is applied with a layer of 1-1.5 mm thick. As the latter, calmecin, zinc-eugenol or eugenol-thymol paste, "Endometasone" and others are used. Good results are obtained from the use of the mineral trioxide aggregate (MTA) from Dentsply. The use of antibiotics, irritants and cauterizers for these purposes is not recommended. On top of the paste, a glass ionomer cement gasket and a seal are sequentially applied.

L.P. Kiselnikova et al. (2002) recommend, after amputation of the crown pulp of deciduous teeth and stopping bleeding, a tampon moistened with 20% formocreson solution or EndoZhi No. 3 (VladMiVa) liquid should be applied to the root canal orifices for 5 minutes. Then the tampon is removed, a layer of zinc-oxide-eugenol cement is applied, preparation for permanent restoration made of glass ionomer cement or compomer is carried out, and a standard crown is fixed. It is possible to use a calcium phosphate-containing gel with chlorhexidine at a concentration of 0.02% as a therapeutic pad (Suntsov V.G. et al., 2006).

It should be borne in mind that after treatment, short-term pain in the tooth from temperature irritants is possible. To remove them, it is recommended to carry out local anesthesia with a 0.5% solution of anesthetic without adrenaline. If such pains continue for more than a week or aching pains appear, then an extirpation method of treatment must be performed.

Evaluation Criteria for Monitoring

	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks

			creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete.

			Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactory "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine .	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactor y 2 "	Has no exact idea. Does not know.

10- Practical lesson

Topic: The method of vital ektirpation. Indications. Technique

Technological map of the practical lesson

Stages of work	Teacher	Student
1. Stages of preparation (10 minutes)	1. Controls the purity of the audience; 2. Checks the readiness of students for classes; 3. Controls attendance;	Listen
2.The introductory stage to classes (10 minutes)	1.Preparation on the topic of content; 2. Preparation of slides for the introductory report; 3. To develop the literature used for the study of the subject;	Write down the topic and listen
3.Main stage (135 minutes)	1. Dividing students into 2 small subgroups, asking questions on the topic; 2. Use of slides and multimedia; 3. Carries out medical work;	Divided into small groups watching,

	4. Combines all information on a given topic, actively the participating students are encouraged and appreciated;	participating, listening. The student expresses his opinion, complements and asks questions
4. Final stage (25 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listen Record Record

Interactive method

USING THE WEAK LINK METHOD

To work you need:

1.Set of questions on the topic

2. A sheet of paper with a list of the group for keeping the protocol of the game.

3.Stopwatch.

Progress:

1. The game is conducted by a teacher and student assistant - a counter.

2. The counter on the sheet writes the date, group number, faculty, the name of the business game and the list of students in the group.

3. The teacher asks questions to students sequentially from a set of questions.

4. The student must in 5 seconds. give an answer.

5. The teacher evaluates the answer with the word “correct” or “incorrect”, if “incorrect” he himself gives the correct answer.

6. The counter puts “+” or “-” in front of the student's surname, depending on the correct answer.

7. Students pass 2 rounds of questions in this way.

8. After 2 rounds of questions, the game is suspended and the students who received 2 minuses are eliminated from the game as a "weak link".

9. The game continues in a new circle with the remaining students. Again, they are offered one new round of questions and again students are eliminated who, in total with the first rounds, have 2 minuses.

10. Round by round, the strongest participant in the game is selected, who answered the most questions.

11. On the sheet against each surname, the teacher registers - who dropped out in which round and became the "weak link".

12. The game is estimated at a maximum of 0.8 points.

students who dropped out after the first 2 rounds of answers receive "0" points for the game,

after 3 round of answers - "0.2" point,

after 4 round of answers - "0.4" point,

after 5 round of answers - "0.6" point

the strongest participant gets 0.8 points.

13. The points given on the protocol sheet are taken into account when calculating the current total of the lesson as an estimate for the theoretical part.

14.In the lower free part of the journal, the teacher makes a note about the conduct of a business game, the headman signs.

15. The game protocol is saved.

Text

Vital extirpation

The essence of the method is that the affected coronal and root pulp is removed from the tooth cavity under anesthesia without prior devitalization. For these purposes, local is used: infiltration and conduction anesthesia, as well as general anesthesia.

Indications: All forms of pulpitis in formed single-rooted teeth and multi-rooted permanent teeth, single-rooted milk teeth.

Reliable anesthesia, carried out with the help of conduction and additional application or intrapulpal anesthesia, allows the patient to complete the treatment in one visit to the doctor. First, the patient is offered to rinse the mouth. A diseased tooth is treated with a 3% alcohol solution of iodine. Anesthesia is performed, then the carious cavity is prepared. A prerequisite for the preparation is the creation of a convenient entrance to the root canals. Having made the opening of the carious cavity, necrotomy, the tooth cavity is removed, the coronal pulp is amputated. They begin to remove the root pulp. This manipulation is performed in different ways:

1. after amputation, the pulpextractor is immediately introduced into the root canal, 1 - 2 revolutions of the instrument are made and the root pulp is removed;
2. after amputation, the root pulp is coagulated (with the active electrode of the DKS apparatus at an exposure of 3 s and a voltage of 50-60 V).

Then a pulpextractor is introduced into the canal and the coagulated pulp is removed. The latter option simultaneously provides hemostasis of the surgical wound. Cryotherapy during pulp extirpation. A fundamentally new approach for slurry devitalization was developed using a refrigerant - a vapor-liquid stream of liquid nitrogen. V. A. Nikitin obtained favorable immediate and long-term results in the treatment of pulpitis with cryoamputation, using low temperatures of the order of -196 ° C. Complications in the periodontium due to short-term deep cooling of the inflamed pulp were not observed. The method proposed by V.A.Nikitin (1974), in

contrast to the existing ones, allows to treat pulpitis in a shorter time without preliminary arsenic devitalization or conduction anesthesia. During extirpation for wound healing and prevention of periodontitis, it is recommended to carry out subtotal pulpectomy: leave a part of the pulp (1 - 2 mm) adjacent to the apical foramen. This is due to the fact that the morphologically detectable transition of periodontal fibrous tissue into a looser root pulp is observed not at the level of the apical foramen, but at a distance of 1/5 - 1/6 of the root length from the apex inside the canal. An attempt to remove the pulp at the apex level is complicated by the rupture of the periodontal tissue surrounding the apex of the tooth, with intense bleeding and the development of traumatic periodontitis. Removal of a smaller part of the root pulp leads to necrosis of the remaining pulp due to the intersection of the return branches feeding it. Established that in the remaining pulp stump after the reactive inflammatory reaction subsides, healing occurs [Corneo J., Martinelli M., 1984, etc.]. Given the presence in the apical region of tissue similar in structure to the pulp and periodontium, the pulp left in the apical part of the canal is considered as a barrier that protects the periodontium from traumatic inflammation. During diathermocoagulation, the active electrode of the coagulator is not brought to the apical foramen. It was found that the depth of coagulation does not exceed 1.5 mm from the end of the electrode. To stop bleeding, use hydrogen peroxide (with a syringe), E-amino-caproic acid, etc. Careful stopping of bleeding is an obligatory stage of vital extirpation. the pulp left in the apical part of the canal is considered as a barrier that protects the periodontium from traumatic inflammation. With diathermocoagulation, the active electrode of the coagulator is not brought to the apical opening. It was found that the depth of coagulation does not exceed 1.5 mm from the end of the electrode. To stop bleeding, they use hydrogen peroxide (with a syringe), E-amino-caproic acid, etc. Careful stopping of bleeding is an obligatory stage of vital extirpation. the pulp left in the apical part of the canal is considered as a barrier that protects the periodontium from traumatic inflammation. During diathermocoagulation, the active electrode of the coagulator is not brought to the apical foramen. It was found that the depth of coagulation does not exceed 1.5 mm from the end of the electrode. To stop bleeding, use hydrogen peroxide (with a syringe), E-amino-caproic acid, etc. Careful stopping of bleeding is an obligatory stage of vital extirpation.

After releasing the root canal from the pulp, it is expanded with the help of endodontic instruments, removing pre-dentin from the walls. It should be borne in mind that the instrumental treatment of the canal of the temporary tooth should be completed no further than 1 - 2 mm from the radiographic apex. Instrumental processing of canals in temporary teeth should be carried out with extreme caution due to the thin walls of the canal, the lesser degree of dentin mineralization and the

wide apical foramen. The irrigation of the canal is carried out gently, without pressure due to the possible pushing of the solution through the wide apical opening. Sterile isotonic sodium chloride solution, sodium hypochlorite, enzyme compositions can be used as a solution for canal flushing.

The root canals of permanent teeth are washed with weak antiseptic solutions (1% chloramine solution, ethacridine lactate solution 1: 1000, furazolidone solution 1 * 50,000; 0.5% furacilin solution, etc.). The choice of antiseptic solutions of low concentration allows you to protect the periodontium from additional irritation. The reactive protection of the periodontal tissue and the phagocytic activity of cellular elements are preserved. Root canals should be filled with non-irritating pastes. Root canals can be sealed at the same visit, but it is preferable to postpone this manipulation for 2 - 3 days. For this period, a turunda with essential oil is left in the canal. Increased requirements are imposed on preparations for filling canals after vital extirpation of the pulp. They should not irritate the pulp and periodontium, but at the same time, they should reliably obturate the canals and contribute to the elimination of the effects of inflammation in the pulp, as well as stimulate its plastic properties. The main condition for filling canals in the vital treatment of pulpitis is the completeness of filling the root canal and reliable obturation of the apical foramen, without removing it beyond its limits into the periodontium. The requirements for occlusive materials used for the treatment of deciduous teeth differ from the requirements for materials for permanent teeth in that they must be non-toxic to the germ of a permanent tooth and resorb. The main condition for filling canals in the vital treatment of pulpitis is the completeness of filling the root canal and reliable obturation of the apical foramen, without removing it beyond its limits into the periodontium. The requirements for occlusive materials used for the treatment of deciduous teeth differ from the requirements for materials for permanent teeth in that they must be non-toxic to the germ of a permanent tooth and resorb. The main condition for filling canals in the vital treatment of pulpitis is the completeness of filling the root canal and reliable obturation of the apical foramen, without removing it beyond its limits into the periodontium. The requirements for occlusive materials used for the treatment of deciduous teeth differ from the requirements for materials for permanent teeth in that they must be non-toxic to the germ of a permanent tooth and resorb.

together with the root. Usually, zinc oxide eugenol paste, iodoform paste, iodinol paste, calcium hydroxide-based materials are used. Materials based on zinc oxide and eugenol have such disadvantages as:

• the likelihood of excretion outside the canal with subsequent irritation of the periapical tissues;

• the degree of resorption, which differs from the degree of resorption of the tissues of the roots of the tooth.

• sometimes the remnants of the paste can remain in the alveolar bone for a long time after the roots of the temporary tooth have been absorbed.

Iodoform paste (KRI-paste, Pharmacheinie, Switzerland) contains iodoform, camphor, parachlorophenol, menthol (Barker B. C. W. et al., 1971; Rifkin A., 1982). It is quickly resorbed (sometimes even inside the canal), non-toxic. In addition to the specified components, Maisto paste also contains zinc oxide, thymol and lanolin. Calcium hydroxide-based pastes are usually not used in temporary teeth, however, Ca (OH) is an iodoform mixture (Nishino M., 1980; Machida Y., 1983; Endoflas, USA). The canals of permanent formed teeth are filled with hardening non-absorbable materials that do not have an irritating effect: calcium-containing preparations, zinc-evgenol paste, silver paste. For the final obturation of the root canals of permanent teeth, modern endodontics offers solid fillers (fillers), represented by gutta-percha and pins made of various materials, and fixing cements (sealers) filling the space between the filler (gutta-percha, pins) and the canal walls. Complications may develop in the coming days after the use of vital methods of treating pulpitis. They usually have the character of spontaneous pain or pain when biting on a tooth. To eliminate them, fluctuating currents or heat are prescribed to the area of the corresponding half of the jaw. A good effect is obtained when the area of the transitional fold at the causal tooth is irradiated with the beams of an LG-75 helium-neon laser. Irradiation mode: power from 10 to 30 mW / cm2, exposure up to 3 minutes, 3-5 procedures per course. In some patients, a positive effect occurs after an injection of hydrocortisone in an amount of 20 mg at the apex of the tooth root. If pain persists,

complete extirpation of the pulp followed by one session of intra-root electrophoresis with 10% iodine tincture. The canals and the tooth are then re-filled in the same way as before. </ Br

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
	96-100	Fine	Complete correct answer to questions

.		"5"	about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows,

			speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactory "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine .	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

11- Practical lesson

Topic: Methods of devital amputation. Indications. Technique...

Technological map of the practical lesson

Stages of work	Teacher	Student
1. Stages of preparation (10 minutes)	1. Controls the purity of the audience; 2. Checks the readiness of students for classes; 3. Controls attendance;	Listen

2.The introductory stage to classes (10 minutes)	1.Preparation on the topic of content; 2. Preparation of slides for the introductory report; 3. To develop the literature used for the study of the subject;	Write down the topic and listen
3.Main stage (135 minutes)	1. Dividing students into 2 small subgroups, asking questions on the topic; 2. Use of slides and multimedia; 3. Carries out medical work; 4. Combines all information on a given topic, actively the participating students are encouraged and appreciated;	Divided into small groups watching, participating, listening. The student expresses his opinion, complements and asks questions
4. Final stage (25 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listen Record Record

Interactive method

USING THE WEAK LINK METHOD

To work you need:

1.Set of questions on the topic

2. A sheet of paper with a list of the group for keeping the protocol of the game.

3.Stopwatch.

Progress:

1. The game is conducted by a teacher and student assistant - a counter.

2. The counter on the sheet writes the date, group number, faculty, the name of the business game and the list of students in the group.

3. The teacher asks questions to students sequentially from a set of questions.

4. The student must in 5 seconds. give an answer.

5. The teacher evaluates the answer with the word “correct” or “incorrect”, if “incorrect” he himself gives the correct answer.

6. The counter puts “+” or “-” in front of the student's surname, depending on the correct answer.

7. Students pass 2 rounds of questions in this way.

8. After 2 rounds of questions, the game is suspended and the students who received 2 minuses are eliminated from the game as a "weak link".

9. The game continues in a new circle with the remaining students. Again, they are offered one new round of questions and again students are eliminated who, in total with the first rounds, have 2 minuses.

10. Round by round, the strongest participant in the game is selected, who answered the most questions.

11. On the sheet against each surname, the teacher registers - who dropped out in which round and became the "weak link".

12. The game is estimated at a maximum of 0.8 points.

students who dropped out after the first 2 rounds of answers receive "0" points for the game,

after 3 round of answers - "0.2" point,

after 4 round of answers - "0.4" point,

after 5 round of answers - "0.6" point

the strongest participant gets 0.8 points.

13. The points given on the protocol sheet are taken into account when calculating the current total of the lesson as an estimate for the theoretical part.

14.In the lower free part of the journal, the teacher makes a note about the conduct of a business game, the headman signs.

15. The game protocol is saved.

Text

The method of devital amputation of the pulp with its subsequent or simultaneous mummification is the most common in the treatment of pulpitis of deciduous teeth in the practice of the domestic dental school.

Long-term experience of use indicates that, if the indications and methods of administration are observed, it gives a good clinical effect.

It is believed that during devitalization and mummification, the root pulp remains fixed and sterile, thereby minimizing the risk of infection spreading to the periapical tissues and the likelihood of internal root resorption. The literature describes two methods of mortal amputation: using arsenous acid as a devitalizing agent and arsenous drugs (paraformaldehyde, trioxymethylene).

Indications:

- Acute partial serous pulpitis (extremely rare) (acute pulpitis, ICD-C, 1995);
- Acute general serous pulpitis (acute pulpitis, ICD-S, 1995);
- Chronic fibrous pulpitis (chronic ulcerative pulpitis, chronic pulpitis, ICD-C, 1995);
- Chronic hypertrophic pulpitis (chronic hyperplastic pulpitis, ICD-C, 1995);
- Exacerbation of chronic pulpitis without acute periodontitis.

Disadvantages of the arsenic method:

1. Morally outdated (used since the 40s of the 19th century).

2. In addition to the necrotizing effect on the pulp, arsenous anhydride has the ability to quickly diffuse into the periodontal tissue.

3. The need for mummification of the root pulp with resocin-formalin mixture in order to prevent the development of periodontitis (additional visit).

▪ It has proven itself well in our republic and is successfully used for pulp devitalization paraformaldehyde, decomposing at body temperature up to monomers of formaldehyde. When applied topically, paraformaldehyde is the first turn affects the endothelium and smooth muscles of capillaries and crayonspulp blood vessels, necrotic changes develop, exudative-inflammatory reactions are suppressed, pulp mummification and sterilization occurs. The paste can be prepared ex tempore (paraformaldehyde - 2.0, anesthesin - 1.0, eugenol or phenol - until the paste is obtained) or commercial preparations can be used:

▪ "Depulpin" "Voco", Germany, contains paraformaldehyde, lidocaine, filler.

▪ "Caustinerf fort sans arsenic" "Septodont, France - the commercial name of the devitalizing agents of the ォ Septodont company, potent, arsenic-free, contains paraformaldehyde / trioxymethylene, a fibrous filler.

Analog - ォ Dewit S サ, ォ VladMiVa サ, Russia.

▪ "Caustinerf Pedodontique sans arsenic", contains paraformaldehyde / trioxymethylene, lidocaine, as well as parachlorophenol and camphor (to enhance the antiseptic effect). Analog - ォ Devit P サ ォ VladMiVa サ, Russia.

Execution technique:

First visit...

1. Preliminary X-ray
2. Pain relief
3. Isolation of the tooth (preferably with a rubber dam)
4. Dissection of carious cavity, opening of the tooth cavity, pulp hemostasis
5. The imposition of devitalizing paste on the exposed pulp in an amount equal to the size of a spherical bur No. 3-5, covered with a dry cotton ball
6. Placement of a temporary seal

Second visit... The patient is appointed in 7-14 days.

1. Isolation of the tooth with a rubber dam (preferably).
2. Removal of temporary filling.
3. Final preparation of the carious cavity, taking into account the topography of the tooth cavity.
4. Opening of the tooth cavity, amputation of the coronal pulp and from the canal orifices.

The amputation is performed with an excavator or a low speed rotating ball bur. With adequate devitalization, the pulp looks like a grayish-white tissue.

5. Closing the mouths of the root canals with PTEO paste (the paste is prepared ex tempore before use, its composition: paraformaldehyde - 0.5; thymol - 0.05; zinc oxide - 5.0; eugenol - until the paste is obtained).

Recently, for covering the orifices of root canals, alternatively
the drug is used “Cresopate”, ォ Septodont サ, France (analogue - ォ Cresodent - paste サ,
ォ VladMiVa サ, Russia). Contains parachlorophenol, camphor (antiseptics), zinc sulfate. V
due to the absence of formaldehyde in the composition, preliminary high-quality devitalization and mummification of the pulp.
6. Placement of a water dentin pad, an insulating pad.
7. Final restoration of the tooth.
8. The drug can be left to devitalize the pulp for 7-30 days, if
the absence of any pronounced pathological changes in the periodontium in during this time.
9. Simultaneously with the devitalization, the pulp is mummified, which allows graduation
treatment at the second visit.
The effectiveness of the method, according to E.M. Melnichenko, I.P. Fraynt (1979) - 99 ア 0.3%.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.

.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactory "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfacto rily "3"	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.
ine	55-60	Satisfactory	Knows, tells not confidently. Has a

.		"3"	partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

12- Practical lesson

Theme: Treatment of pulpitis with a combination method. Indications. Technique of carrying out. Errors and complications Complications, after the treatment of pulpitis (after a long time).

Technological map of the practical lesson

Stages of work	Teacher	Student
1. Stages of preparation (10 minutes)	1. Controls the purity of the audience; 2. Checks the readiness of students for classes; 3. Controls attendance;	Listen
2.The introductory stage to classes (10 minutes)	1.Preparation on the topic of content; 2. Preparation of slides for the introductory report; 3. To develop the literature used for the study of the subject;	Write down the topic and listen
3.Main stage (135 minutes)	1. Dividing students into 2 small subgroups, asking questions on the topic; 2. Use of slides and multimedia; 3. Carries out medical work; 4. Combines all information on a given topic, actively the participating students are encouraged and appreciated;	Divided into small groups watching, participating, listening. The student expresses his opinion, complements and asks questions

4. Final stage (25 minutes)	1. Conclusion. 2. Independent work. 3. Homework.	Listen Record Record

Interactive method

USING THE WEAK LINK METHOD

To work you need:

1.Set of questions on the topic

2. A sheet of paper with a list of the group for keeping the protocol of the game.

3.Stopwatch.

Progress:

1. The game is conducted by a teacher and student assistant - a counter.

2. The counter on the sheet writes the date, group number, faculty, the name of the business game and the list of students in the group.

3. The teacher asks questions to students sequentially from a set of questions.

4. The student must in 5 seconds. give an answer.

5. The teacher evaluates the answer with the word “correct” or “incorrect”, if “incorrect” he himself gives the correct answer.

6. The counter puts “+” or “-” in front of the student's surname, depending on the correct answer.

7. Students pass 2 rounds of questions in this way.

8. After 2 rounds of questions, the game is suspended and the students who received 2 minuses are eliminated from the game as a "weak link".

9. The game continues in a new circle with the remaining students. Again, they are offered one new round of questions and again students are eliminated who, in total with the first rounds, have 2 minuses.

10. Round by round, the strongest participant in the game is selected, who answered the most questions.

11. On the sheet against each surname, the teacher registers - who dropped out in which round and became the "weak link".

12. The game is estimated at a maximum of 0.8 points.

students who dropped out after the first 2 rounds of answers receive "0" points for the game,

after 3 round of answers - "0.2" point,

after 4 round of answers - "0.4" point,

after 5 round of answers - "0.6" point

the strongest participant gets 0.8 points.

13. The points given on the protocol sheet are taken into account when calculating the current total of the lesson as an estimate for the theoretical part.

14.In the lower free part of the journal, the teacher makes a note about the conduct of a business game, the headman signs.

15. The game protocol is saved.

Text

Purpose of the lesson: To get acquainted with the indications and methods of carrying out the combined method of pulpitis treatment, to learn how to carry out the combined method in the treatment of pulpitis.

Lesson plan:

1. Indications for a combined treatment method.

2. The technique of carrying out the combined method with the use of devitalizing pastes.

3. The technique of carrying out the combined method under anesthesia.

The essence of the method: In multi-rooted teeth in difficult-to-pass root canals, if it is impossible to completely extirpate the pulp (curvature of more than 25 °, deep bifurcation of the roots, breaking off the instrument in the root canals, obliteration), the method of deep amputation is performed, and in passable ones - the method of extirpation. In practice, this method is used much less frequently than extirpation, since at present there is an arsenal of drugs and instruments that allows chemical and mechanical expansion of curved, obliterated root canals.

The method is called combined, since the pulp is completely removed from the passable root canals and they are filled to the apex with a permanent root filling material, and in impassable ones, the amputation method is performed, followed by the imposition of mummifying pastes. The combined method can be used after preliminary pulp devitalization and X-ray examination. On the second visit, mechanical medication is carried out

carious cavity, open the cavity of the tooth, carry out amputation of the coronal pulp. Next, the pulp and well-passable canals are extirpated. The mouth of poorly passable canals is expanded using a reverse conical bur, creating a platform for mummifying paste. If the canal is partially passable, then the pulp is removed to the passable part, the remaining part is impregnated and sealed with mummifying paste. After treatment of difficult-to-pass canals with mummifying paste, they are closed with a lining of water dentin. Then proceed to the processing and filling of a well-passable canal according to a well-known technique. A common gasket and a permanent seal are applied.

Currently, a resorcinol-formalin mixture is used more often for impregnation. For mummification, pastes can be used:

Rp .: Tricresoli 2.5 Creolini 5.0 Trioxymethyleni 5.0 Zinci oxydati 15.0 Glycerini qs ut fiat pasta DS Triopasta Gizi.

Rp .: Thyraoli

Zinci oxydati aa 2.5

Formalini 0.5

Glycerini qs ut fiat pasta

DS Formalin-thymol paste.
#
Rp .: Zinci oxydati 30.0
TricresoU 15.0
Formalini 4.0
Glicerini 1.0
M. ut fiat pasta
DS Tricresolformalin paste.
#
Rp .: Trioxymethyleni 0.5 Thymoli 0.05 Zinci oxydati 5.0 Olei Camphorati qs ut fiat pasta DS Asphaline paste.

Rp .:

Paraformaldehydi

Thymoli aa 1.0

Zinci oxydati 5.0

Glycerini qs ut fiat pasta

DS Steam-formaldehyde thymol paste.

The use of ready-made preparations of the Septodont company is possible: Tempofor, Forfenan, Rokle No. 4 on dexamethasone, Rokle concentrate.

The resorcinol-formalin method was first proposed by Albrecht in 1913. Resorcinol-formalin mixture is a strong antiseptic and penetrates into all branches of the dentinal tubules, soaking their contents. During the polymerization process, the liquid turns into a solid mass, which fills all the channels. The method also has its drawbacks.

During and after endodontic treatment, various errors and development are possible complications. They can be conditionally divided into two groups.
Errors and complications associated with the creation of endodontic access: • insufficient removal of the fornix of the tooth cavity; • perforation of the tooth crown at the neck level; • i perforation of the walls of the crown cavity; •; perforation of the bottom of the crown cavity; • perforation in the area of bifurcation; • breaking off the vestibular or lingual wall of the tooth; • staining of the crown of non-vital teeth. Errors and complications associated with chemomechanical preparation and root canal obturation: absence of the root canal mouth; skipping probable root canals; the formation of a ledge in the wall of the root canal; perforation of the root canal wall; breaking off the instrument in the root canal; longitudinal root fracture; formation of the channel in the form of an "hourglass"; formation of the lower curvature of the channel in the form of "saw teeth";pushing the decay products of the pulp through the

upper cervical opening into the periapical tissue; • foreign material in the periapical tissues; • blockade of the root canal; • apical perforation; • reaction to endodontic medications (materials); • damage to the growth zone of an unformed root of a permanent tooth; • trauma to the rudiment of a permanent tooth during the treatment of temporary teeth; • perforation of the walls of the maxillary sinus; • trauma to the neurovascular bundle in the canal of the lower jaw; • postendodontic 'compression neuropathy of the branches of the trigeminal nerve ;;' • poor quality root canal filling: - incomplete filling of the root canal; - removal of the filling material for the apical opening; aspiration or swallowing of rod instruments; air embolism ^ Formation of subcutaneous emphysema of the face and neck; post-endodontic pain; root canal reinfection; persistent peri-root infections.

Let's consider some of the most severe and common complications in endodontic treatment and ways to eliminate them.

TOOTH PERFORATION

'Perforation is defined as an artificial hole in the <tooth or its root, as a result of which the cavity of the tooth communicates with the periodontal tissues. There are the following tooth perforations: lateral (through the walls of the crown cavity); furcation (through its bottom); walls of the root canal and apical foramen.

Perforations result from poor orientation, viewing and rough preparation - without regard to the position of the tooth and its working length.

Perforation should be considered a significant limiting factor in endodontic treatment.

Perforation of the walls and bottom of the crown cavity is most often observed with poor knowledge of the topographic features of its structure and excessive expansion of the orifices of the root canals, sometimes as a result of an attempt to detect the mouth of the sclerosed canal.

The diagnosis of perforation of the bottom and walls of the crown cavity is not very difficult.

The perforation of the bottom of the crown cavity is easy to detect by probing. Indication of root canal orifices using dyes helps to avoid perforation of the bottom of the crown cavity of a multi-rooted tooth. Of course, it is important, as already mentioned, to know the topography of the root canals and their orifices.

Perforation of the bottom and walls of the crown cavity requires urgent measures. Perforation should be repaired immediately after it occurs, as delay can lead to the development of an inflammatory process at the site of perforation, which is difficult to treat and jeopardizes the possibility of tooth preservation.

Treatment of lateral perforations of the crown cavity is reduced to exposing the neck of the tooth by surgery and filling, similar to the treatment of class V cavities.

Furcation perforations are removed through the crown cavity using materials for retrograde canal filling (amalgam, glass ionomer cements, compomers, calcium phosphate cements, osteoplastic materials). The classic perforation filling for the bottom of the crown cavity is gold foil, on top of which the amalgam is laid.

The success of treatment will depend on the ability to fill the perforation without a significant excess of filling material in the periodontium and the prevention of infectious inflammation in it. -.

Narrow perforations are bbutured according to the principles of root canal filling. With wide perforation, preparations based on calcium hydroxide are preliminarily applied to the wound.

Perforation of the root canal wall can be the result of inaccurate use of endodontic instruments when their axis does not correspond to the direction of the root canal. In addition, perforation of the canal wall can occur when trying to prepare curved root canals. Depending on their location, root canal perforations are divided into apical, middle and coronal.

Perforation of the root canal wall is evidenced by acute pain that suddenly appeared during manipulation in the tooth cavity, as well as the appearance of blood in the lumen of the root canal. In this case, an X-ray examination is required with a root needle inserted into the canal. Most often, the root of the tooth is perforated in the places of its curvature. The resorbed root wall is particularly easily perforated.

To prevent perforation of the root canal wall, forced passage of narrow and obliterated root canals and irrational use of machine instruments should be avoided. In addition, it is advisable to periodically resort to X-ray control during the passage of the root canal. It may be useful to study the roentgenogram of the tooth root with the help of a 4 magnifying glass, which reveals the abrasions of the root canal wall, against which the instrument can rest and, when rotating, perforate the canal shade. 'When perforating the wall of the Root Canal, an instrument is used to treat the canal, which is then filled with oyeoplastic materials. Before filling, to eliminate the inflammatory process in the lateral periodontium associated with perforation, intracanal electrophoresis of tincture of iodine or potassium iodide is useful.

If perforation occurs in the apical third of the root, it is usually repaired by root apex resection.

Perforation of the peri-apical tissues (apical perforation) is caused by the withdrawal of the rod instruments from the apical foramen. In this case, the patient reacts painfully. However, the pain often subsides quickly. The instrument brought out for the apex of the root is easily detected radiographically. An intact instrument is usually easily retrieved from the root canal. After that, blood or bloody fluid can be found in the lumen of the root canal. After drying the root canal, a dry cotton turunda is left in its lumen. If the walls of the root canal were sufficiently processed before and the patient had no complaints, and no moisture was found in the lumen of the root canal, the treatment of the tooth is completed by filling the root canal.

Inadequate root canal filling

In endodontic practice, there are cases when it is necessary to unseal previously obturated root canals. Common reasons for root canal retreatment are complaints of pain when biting (as a result of the removal of the filling material by the apex of the root); underfilling of the canal; the presence of signs of destruction of bone tissue on the roentgenogram, despite the fact that the canal is filled up to the apical foramen; the need for partial unsealing of the canal under the post or stump tab.

Before proceeding with retreatment, an X-ray should be taken, which will allow you to determine the difficulties possible during retreatment. Based on X-ray data on the location and direction of the canals, as well as clinical indicators for retreatment of the tooth, tactics, method, material and instrumentation are determined. It should be borne in mind that any retreatment of root canals not only increases the deformation of the tooth, but also increases its fragility due to mechanical stress associated directly with deobturation and re-preparation and obturation of the canals.

During root canal retreatment, a dentist is faced with a number of questions. First, the rationality of retreatment and the reality of tooth preservation should be determined. Then it is necessary to find the mouth of the canals, determine their direction, the type of material with which the canal was sealed, etc. Pay attention to the color of the material at the mouth of the canal, as well as the color of the material particles on the working part of the instrument with which the canal was examined.

In dental practice, the following methods are used to remove filling material from root canals: • mechanical - using endodontic instruments; • physical - using ultrasound and heating; • chemical - using various solvents; The mechanical method of removing filling materials should be used for partial unsealing of the root canal under the stump or post, when it is necessary to unseal the canal to a certain depth. Use both hand and machine endodontic instruments or alternate between them. Endodontic instruments such as Largo, Peeso-Reamer, Kreamer are used.

Some firms produce special sets of tools for unsealing canals.

Substantial assistance is provided by ultrasonic instruments, which allow you to loosen the intra-root pins or destroy the material inside the root canal.

Instruments with a non-working tip are used to reduce the risk of incorrect passage of the canal.

The crown part of the tooth is unsealed to provide visual access to the root canals.

The opening of the channel for the first 2-3 mm is carried out using a small spherical steel bur. The first millimeters of the canal are usually unsealed very easily.

Difficulties begin when the canal narrows and the instrument gets stuck in its lumen. In this case, it is necessary to resort to drugs that soften and dissolve filling materials.

These preparations help to remove filling materials that contain eugenol (Endosolv E, "Septodont"), resorcinol-containing resin (Endosolv R), gutta-percha (halothane, eucalyptol, xylene, chloroform). They greatly facilitate the task of softening and removing the filling material from the canal. They also use drugs that allow you to expand the lumen of the canal due to the chelating action.

Before proceeding with the chemical removal of the root filling, the crown filling must be removed. After removing the pad, it is necessary to free the root canal orifices, expand them and create a funnel-shaped depression - a reservoir for the solvent. After the introduction of the solvent into the orifice of the canal, the root filling layer softens. With the K-file, the solvent must be pushed a little deeper into the root canal opening.

The next step is to remove the softened material from the orifice of the root canal. Depending on the size of the mouth, select the appropriate K-file. After adding a fresh portion of K-file solvent of the corresponding diameter, the movements are

made as when winding a watch, gradually deepening into the canal. As you get closer to the top of the root, apply a smaller K-file, following the "crown down" technique. In case of difficulties arising in the process of unsealing, the dissolving liquid can be left in the mouth or cavity of the canal with its partial passage for several days. Root apex must be confirmed radiographically or electrometrically.

If the root canal has passed through the root filling to the apex of the root, the parietal material can be removed. At the same time, it is convenient to use a tool with aggressive side surfaces - H-file. To remove the parietal material, H-file is introduced into the

Conservative endodontics ♦ 123 piled up to the stop. Pressing the instrument against the wall of the root canal, the lateral edges are scraped off the filling material from the walls. By successively changing the H-iile to larger instruments, complete removal of the filling material is carried out.

The criterion for high-quality removal of filling material is the appearance of dentin sawdust.

In some cases, together with the filling material, it is necessary to remove metal or other intra-root retention structures - root posts and rods. They are exposed by carefully drilling the filling material around.

Evaluation Criteria for Monitoring

o.	Progress in% and points	Grade	Student knowledge level
.	96-100	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Shows high activity, creative approach when conducting interactive games. Correctly solves situational problems and test questions. Analyzes independently. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	91-95	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Analyzes research results independently. Understands the essence of the

			issue. Knows, tells confidently. Has an accurate idea.
.	86-90	Fine "5"	Complete correct answer to questions about the clinic, diagnosis and treatment of TBI. Summarizes and makes a decision. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	81-85	Good "4"	The correct answer to questions about the clinic, diagnosis and treatment of TBI, but there are 2-3 inaccuracies, errors. Thinks creatively. Solves situational tasks correctly. Understands the essence of the issue. Knows, tells confidently. Has an accurate idea.
.	76-80	Good "4"	Correct, but incomplete coverage of the issue. The student knows questions about the clinic and diagnosis of TBI, but is not fully versed in determining treatment tactics. Correctly solves situational problems, but the rationale for the answer is not complete. Understands the essence of the issue. Knows, speaks confidently
.	71-75	Good "4"	Correct, but incomplete coverage of the issue. Correctly solves situational problems, but the justification for the answer is incomplete. Has 2-3 errors. Knows, tells confidently. Has accurate ideas.
.	66-70	Satisfactorily "3"	Understands the essence of the issue. Correctly solves situational problems, but cannot substantiate the answer. Has accurate ideas on specific issues.
ig ht.	61-65	Satisfactorily	Has an incomplete understanding of the topic. Makes mistakes when solving situational tasks. Tells not confidently.

		"3"	
ine.	55-60	Satisfactory "3"	Knows, tells not confidently. Has a partial view.
en.	54 and below	Unsatisfactory "2"	Has no exact idea. Does not know.

DENTAL DICTIONARY - GLOSSARY

Dentistry-(from the Greek stoma, stomatos - mouth; and logos - teaching) is a field of clinical medicine that studies the etiology and pathogenesis of diseases and injuries of teeth, oral organs and maxillofacial region, which develops methods for their diagnosis, treatment and prevention. One of the types of dentistry:

- **Therapeutic dentistry**Is a section that includes:
  - ***odontology***(studies diagnostic methods and determines the treatment of diseases associated with tooth damage);
  - ***endodontics***(develops methods of medicinal and mechanical influence (impact) on the root canals of the teeth, including periodontology and filling).

The main tasks of therapeutic dentistry are the study of periodontal tissues, as well as the prevention and treatment of diseases that have been caused by it. In addition, therapeutic dentistry deals with the diagnosis and treatment of diseases of the oral mucosa.

- **Adhesives** Are substances that reinforce or create adhesion, adhesion. They are thick liquids or gels and are used to fix the veneer to the surface of dental tissues (enamel, dentine). They are also called binders.
- **Adhesion (sticking)** Is the adhesion of surfaces of dissimilar materials.
- **Direct adhesion (bonding)**- This is the elimination of minor teeth defects by restoration, i.e. application and fixing of light-cured filling material. It is used for the restoration of small chips of the incisal edge of the tooth, the elimination of wedge-shaped defects in the area of the necks of the teeth, the elimination of spaces between the teeth. The method allows you to preserve the tooth tissue.

- **Anatomical shape of the tooth** - this is the shape acquired by the tooth at the moment of development of the body, best adapted to chewing in the vicinity of other teeth, which has its own characteristics in height, width and grooves on the surface.
- **Apexlocator**is an electronic device for determining the length of the root canal by changing the resistance to electric current. Shows canal length in millimeters, shows apex point.
- **Drill** - this is a drilling machine designed for preparation of hard tissues of teeth with special cutting tools. Distinguish between non-electrical and electrical machines. Electric ones have different designs: standing, floor-standing, wall-mounted, portable. Air turbine drills are designed to process hard dental tissues at high speeds using a bur made of high-strength alloys and high-hardness abrasive materials.
- ***Vertical condensation*** *Is a method of filling (filling) the root canal of a tooth with heated gutta-percha by tamping it with a special tool along the length of the canal. The warmed-up gutta-percha passes through the branches of the canals. This ensures their filling (sealing) better than with lateral condensation, where cold gutta-percha is used.*
- **Gutta-percha**is a special material for filling tooth canals. It can be "cold" in the form of pins or "hot" when it is inserted into the canal in a heated state.
- ***Dentine*** *Is the supporting tissue of the tooth. In terms of hardness, it takes the second place (the first belongs to enamel) among biological tissues. The chemical composition of dentine: organic salts 28%, lime salts 70%, other salts 2%. The large amount of organic matter in dentin favors metabolic processes. The dentin layer in the tooth is uniform, and therefore some authors call dentin the supporting tissue of the tooth. Dentin thickness is on average 1.5-2.5 mm in the neck area and 3-4 mm on the occlusal surface. Of the minerals, dentin contains hydroxylappatite crystals. During life, there is an increase in dentin and a decrease in the cavity of the tooth.*
- **Depulpation**- This is the removal of the pulp (nerve) of the tooth in order to eliminate inflammation or injury.
- **Gum**- This is the part of the oral mucosa that directly surrounds the teeth. There are three parts: free, attached and gingival interdental papillae.
- ***Fissure sealing (sealing)*** *Is a medical procedure, the purpose of which is the introduction of a therapeutic filling material into the fissures (grooves on the surface of the tooth) to prevent the occurrence of a carious defect. Used for the prevention of dental caries in children.*
- **Caries**is a disease of the hard tissues of the tooth, which occurs with the obligatory presence of microorganisms, as a result of which its functional and aesthetic defects are formed.
- **Composite**is a type of plastic with a high content of inorganic filler.
- **Correction of the filling**- This is the removal of roughness and overhanging edges of the filling material with tools.

- **Lateral condensation**- This is a method of root canal filling with cold gutta-percha, which penetrates into the main space of the root (in contrast to vertical condensation, when heated gutta-percha is used, which penetrates into the lateral openings of the canal).
- ***Filling materials for filling the root canals of teeth*** *- these are materials of various properties, used to fill root canals in order to eliminate voids and prevent inflammation. Old generation: cements, pastes (change the color of the tooth, dissolve over time, are short-lived). New generation: synthetic materials based on resins (must be used with gutta-percha - they do not change the color of the treated tooth, are resistant to temperature fluctuations, do not dissolve, do not sag).*
- ***Filling materials for teeth****These are materials of various properties used for the restoration of the crown part of the tooth. Older generation: amalgams, cements, plastics. New generation: various types of restoration composite (complex structural) materials.*
- **Matrix**- this is a special tape, usually made of celluloid or metal, that covers the tooth and helps to form the filling of the correct shape.
- **Obliteration**- this is a narrowing or closing of the lumen of something, for example, a tooth canal, due to age-related, inflammatory changes, or previous treatment.
- **Obturation**- This is the filling of the root canal with filling material (paste, gutta-percha).
- **Perforation**is a hole, a message of something with something. More often they talk about perforations in the bottom of the tooth cavity, its walls or root. It occurs as a consequence of a carious process, or a complication in the mechanical processing of tooth tissues.
- ***Filling****-this is an incorrect expression for the process of filling the tooth cavity with filling material. Seal - filling.*
- **Dissection**- This is the excision of hard tooth tissues using instruments, burs or a laser.
- **Bite**- this is the closing of the upper and lower dentition.
- ***Tooth restoration -****this is a reconstruction of the shape of a tooth that has been lost as a result of a carious process or trauma.*
- ***Symptom -****it is a sign of a pathological condition or disease, a qualitatively new phenomenon that is not characteristic of a healthy body, which can be detected using clinical research methods, used for the diagnosis and (or) prognosis of the disease.*
- ***Syndrome -****it is a persistent collection of symptoms.*
- ***Taurodont -*** *these are teeth with a very large pulp chamber filling most of the root. Found during excavations, since such teeth are characteristic of ancient people (for example, Neanderthals).*
- **Trepanning of the tooth crown**- this is the excision of tooth tissue to provide access to the root canals

SAMPLE PROGRAM

WORKING PROGRAM

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