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**MODERN FOUNDATIONS OF DIAGNOSIS AND TREATMENT OF
PERIODONTAL DISEASES: CLINICAL APPROACHES, ORTHOPEDIC
PROSTHODONTICS, AND DIGITAL TECHNOLOGIES**

Study guide

For areas of study: 60910100- Dentistry (by Fields of Specialization)

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DEPARTMENT OF HOSPITAL ORTHOPEDIC DENTISTRY

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This textbook is intended for 5th year Dental students. The textbook presents the topics of practical classes, situational tasks, and test questions for the Periodontology program performed by students. The materials are illustrated with drawings.

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Introduction

Periodontics is one of the most complex and dynamically developing fields of modern dentistry. She studies the structure, functions, physiological and pathological processes in the tissues surrounding the tooth, which include the gums, periodontium, root cement and alveolar bone. These structures are combined under the concept of "periodontal" and ensure the anatomical integrity of the maxillary system, chewing efficiency, articulation and aesthetic parameters of the face. Maintaining periodontal health is a key condition not only for preventing tooth loss, but also for maintaining the patient's overall dental and systemic health.

Periodontal diseases — gingivitis, periodontitis and periodontal disease — occupy one of the leading places in the structure of dental pathology. According to epidemiological studies, more than half of the adult population suffers from various forms of periodontitis, which determines the high social significance of the problem. The main etiological factor is microbial biofilm and plaque, which form a complex biocenosis of microorganisms capable of inducing inflammation and destruction of periodontal tissues. However, the modern understanding of pathogenesis goes far beyond the framework of infectious theory, considering periodontal diseases as a multifactorial pathology based on the interaction of microbial, immune, genetic, metabolic and behavioral factors. Special attention is paid to the role of systemic diseases such as diabetes mellitus, cardiovascular pathology, hormonal disorders and immunodeficiency conditions, which can significantly worsen the course of periodontitis and reduce the effectiveness of treatment.

In recent decades, significant progress has been made in understanding the mechanisms of periodontal disease development and developing methods for their diagnosis and therapy. High-tech research methods are being actively introduced into clinical practice: digital radiography, cone beam computed tomography, optical coherence tomography, fluorescence diagnostics, microbiological analysis, PCR identification of pathogens, determination of salivary and serum biomarkers of inflammation. These methods make it possible to detect early changes in periodontal

tissues, assess the degree of bone destruction, determine the microbial spectrum and individual characteristics of the inflammatory response.

Modern approaches to the treatment of periodontal diseases include a complex of conservative, surgical, regenerative and physiotherapeutic techniques. Traditional methods include professional oral hygiene, the elimination of plaque retention factors, indoor and outdoor curettage, drug therapy and occlusion correction. In parallel, innovative technologies are actively developing: laser therapy, photodynamic effects, the use of plasma-rich drugs (PRP, PRF), the use of biocompatible membranes and bone-plastic materials, growth factors, stem cells and tissue engineering structures. An interdisciplinary approach involving orthodontists, implantologists, internists, and general medicine specialists plays an important role, which makes it possible to comprehensively address patient rehabilitation issues.

Prevention of periodontal diseases remains the most effective and economically feasible area of modern dentistry. It includes systematic occupational hygiene, patient training in proper oral care, risk factor control, regular follow-up, and supportive therapy. To date, it has been proven that supportive periodontal treatment is the key condition for long-term remission and prevention of relapses.

The development of periodontology is impossible without scientific research that clarifies the mechanisms of interaction between microorganisms and the immune system, studies genetic predisposition, improves diagnostic technologies and forms criteria for personalized therapy. This discipline is based on a combination of fundamental knowledge, clinical experience and new technologies, ensuring high standards of treatment and prevention.

This textbook is devoted to the current state of periodontology and reflects the data of the world scientific literature, the results of experimental and clinical studies, as well as the experience of practicing specialists. The material covers the etiology and pathogenesis of periodontal diseases, modern diagnostic methods, principles of conservative and surgical treatment, regenerative technologies and approaches to

prevention. Its goal is to train a competent dentist with deep theoretical knowledge and practical skills, able to correctly diagnose and effectively treat periodontal diseases, carry out interdisciplinary interaction and provide a high level of dental care.

**TOPIC 1. MODERN APPROACHES TO THE EXAMINATION, DIAGNOSIS,
TREATMENT PLANNING AND PREVENTION OF PATIENTS WITH
PERIODONTAL DISEASES: CLINICAL METHODS, DIGITAL TECHNOLOGIES,
APPLICATION OF ARTIFICIAL INTELLIGENCE, AND TACTICS OF THE
GENERAL DENTAL PRACTITIONER.**

Periodontal is a complex of tissues surrounding a tooth and having a genetic and functional community.

Periodontal disease includes the following formations:

- gum with periosteum;
- periodontal;
- bone of the alveoli;
- cement of the tooth root.

Age-related changes in periodontal tissues. The involutive changes in periodontal tissues are caused by changes in the genetic apparatus of the parotid tissue cells and a decrease in their metabolism., intensity of physico-chemical processes. Changes in vascular walls, collagen, enzyme activity, immunobiological reactivity, and decreased transport of nutrients and oxygen play an important role in the aging of periodontal tissues, which leads to the predominance of cell decay processes over their recovery processes.

With age-related changes, the gums are prone to hyperkeratosis, characterized by thinning of the basal layer, atrophy of epithelial cells, and homogenization of the fibers of the subepithelial layer gums, a decrease in the number of capillaries, expansion and thickening of the walls of blood vessels, a decrease in the amount of collagen, the disappearance of glycogen in the cells of the thorny layer, a decrease in the content of lysozyme in the gum tissues, their dehydration.

The number of penetrating cement fibers in bone tissue decreases, hyalinosis increases, the activity and number of proteolytic enzymes increase, the bone marrow

spaces expand, the cortical plate thickens, the channels of the osteons expand and are filled with adipose tissue. Destruction of bone tissue with age may also be due to a decrease in the anabolic effect of sex hormones with a relative predominance of glucocorticoids.

Clinically and radiologically, involutional changes in periodontal tissues are characterized by gum atrophy, exposure of root cement in the absence of periodontal pockets and inflammatory changes in the gum, osteoporosis (especially postmenopausal) and osteosclerosis, narrowing of the periodontal fissure, hypercementosis.

Periodontal functions. The periodontal gland is responsible for barrier and trophic functions; performs reflex regulation of masticatory pressure; performs a plastic and shock-absorbing role. He tolerates significant physical overloads, is resistant to infection and intoxication.

The reserve forces of the periodontium (Latin reserve/ praeservare – to save, preserve) is the difference between the maximum load that the periodontium can withstand and the load that the periodontium usually experiences when chewing.

Normally, the periodontal tissue of each tooth has a certain endurance (Table 1). This endurance is determined by the pressure that each tooth can withstand before the appearance of pain. It was these data that formed the basis of the odontoparodontogram. The endurance of each tooth was studied using a gnathodynamometer.

Table 1.1.

Periodontal endurance coefficients
(according to V.Y. Kurlandsky)

	Teeth											
	1	1	2	2	3	3	54	54	76	76	8	8
			21	12	3	3	54	54	76	76	8	8
Normal (initial data)	1,25		1		1,5		1,75		3,0		2,0	
Stage 1 atrophy (1/4)	0,9		0,75		1,1		1,3		2,25		1,5	
Stage 2 atrophy (1/2)	0,6		0,5		0,75		0,9		1,51		1,0	
Stage 3 atrophy (3/4)	0,3		0,25		0,4		0,45		0,75		0,5	

Normally, according to V.Y. Kurlandsky, dental periodontal uses only half of its capacity, leaving 50% of reserve forces. V.Y. Kurlandsky believes that with the loss of bone tissue, the periodontal's ability to withstand applied loads decreases proportionally and presents this as a purely arithmetic process (Table 2).

Table 1.2.

Reduction of reserve forces in case of bone atrophy

Degree	N	I	II	III	IV
Atrophy	0	1/4	1/2	3/4	>3/4
Endurance	1,5	1,125	0,75	0,375	0
The necessary force when crushing food	0,75	0,75	0,75	0,75	0,75
Reserve	0,75	0,375	0	0	0
Functional insufficiency	0	0	0	0,375	0,75

Backup power periodontal depend on:

- hereditary factors;
- the General condition of the body;
- condition of periodontal tissues;
- nature of food intake;
- transferred to local diseases;
- the ratio of the roots and crowns of the teeth;
- the number of roots;
- value of the root surface.

The odontoparodontogram was proposed by Professor V.Y. Kurlandsky in 1953 and is a graphical registration of the stage of periodontal tissue atrophy (Table 3).

Table 1.3.

**Example of filling in an odontoparodontogram
(according to V.Y. Kurlandsky)**

	N=11.5					N=7.5					N=11.5						
Более ¾	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N= 30.5
¾	0.5	0.75	0.75	0.45	0.45	0.4	0.25	0.3	0.3	0.25	0.4	0.45	0.45	0.75	0.75	0.5	
½	1.0	1.5	1.5	0.9	0.9	0.75	0.5	0.6	0.6	0.5	0.75	0.9	0.9	1.5	1.5	1.0	
¼	1.5	2.25	2.25	1.3	1.3	1.1	0.75	0.9	0.9	0.75	1.1	1.3	1.3	2.25	2.25	1.5	
N	2.0	3.0	3.0	1.75	1.75	1.5	1.0	1.25	1.25	1.0	1.5	1.75	1.75	3.0	3.0	2.0	
Подвижность																	
Одонтограмма																	
	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	
Одонтограмма																	N= 30.0
Подвижность																	
N	2.0	3.0	3.0	1.75	1.75	1.5	1.0	1.0	1.0	1.0	1.5	1.75	1.75	3.0	3.0	2.0	
¼	1.5	2.25	2.25	1.3	1.3	1.1	0.75	0.75	0.75	0.75	1.1	1.3	1.3	2.25	2.25	1.5	
½	1.0	1.5	1.5	0.9	0.9	0.75	0.5	0.5	0.5	0.5	0.75	0.9	0.9	1.5	1.5	1.0	
¾	0.5	0.75	0.75	0.45	0.45	0.4	0.25	0.25	0.25	0.25	0.4	0.45	0.45	0.75	0.75	0.5	
Более ¾	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	N=11.5					N=7.0					N=11.5						

An odontoparodontogram is used to select the design of the prosthesis (removable or bridge-like prosthesis, the number of supporting teeth).

To do this, information about the depth of the periodontal pocket, obtained during a clinical examination and according to X-ray data, is entered into a table and the endurance coefficient is determined for each tooth.

After that, you can calculate, for example, the number of supporting teeth required for prosthetics with a bridge prosthesis. A bridge-like prosthesis in the chewing group of teeth can be created with the sum of the periodontal endurance coefficients of the supporting teeth of at least 4.75 units; the frontal group of teeth of the lower jaw – at least 3.5 units; in the frontal group of teeth of the upper jaw – at least 3 units.

1.1. Diagnosis of periodontal diseases.

In the process of diagnosing periodontal disease, the doctor's task is to detect the problem, identify the cause and explain it to the patient. Effective treatment cannot be achieved without the active participation of the patient.

The algorithm of examination of a patient with periodontal diseases

1. Passport data of the patient. Last name, first name, father's name of the patient, age, place of residence, place of work.
2. Collecting complaints. In periodontal diseases, patients complain of bleeding gums when brushing their teeth, eating, pain in the gums, tooth mobility, changes in tooth position, bad breath, tooth sensitivity, baring of the necks of teeth, etc.
3. Collecting anamnesis of the disease, anamnesis of life. Combined pathology is characterized by the mutually aggravating effect of the disease due to the close functional interaction between the affected internal organs and the oral cavity. In this regard, diseases of the gastrointestinal tract and respiratory organs may be of particular interest. Malabsorption syndrome in inflammatory diseases of the gastrointestinal tract, prolonged use of glucocorticosteroid hormones in chronic obstructive pulmonary diseases lead to osteomalacia and/or osteoporosis. The pathogenesis of these disorders will have significant differences depending on the type of somatic pathology. Currently, osteoporosis is the main problem of metabolic diseases bone tissue. Osteoporosis is a dystrophic disease characterized by low bone, impaired trabecular microarchitectonics, and a high risk of fractures. With progressive osteoporosis, changes in the skeleton are common. As a result of a

systemic shift in metabolism caused by impaired absorption of calcium from the gastrointestinal tract and the suppressive effect of glucocorticosteroid hormones on the proliferation and functional activity of osteoblasts, changes occur in the bones of the skeleton, including in the jawbones. Also, when collecting a life history, the patient's bad habits are revealed, paying special attention to smoking and excessive coffee consumption.

4. External inspection.

5. Examination of the oral cavity, periodontal.

Criteria for healthy gums:

- pink color,
- pointed tips of interdental papillae,
- density of tissue,
- lack of bleeding.

Signs of inflammatory phenomena:

- hyperemia,
- cyanosis,
- swelling,
- bleeding gums,
- ulceration,
- hypertrophy or atrophy



Fig 1.1. *Healthy periodontium in an 18-year-old girl: the gingiva is pale pink, the gingival papillae are pointed, and oral hygiene is good.*

Periodontal pockets



Fig. 1.2. *Clinical presentation of chronic generalized periodontitis of severe degree in the exacerbation stage in a 40-year-old man: pronounced hyperemia, gingival edema and bleeding, gingival recession, and secondary deformation of the dental arches.*



Fig. 1.3. *Clinical presentation of chronic generalized periodontitis of moderate severity in the remission stage in a 56-year-old woman: moderate hyperemia, gingival edema, gingival recession, and formation of a diastema between the lower incisors.*



Fig. 1.4. *Clinical presentation of lichen planus-associated desquamative gingivitis in a 53-year-old woman: intense hyperemia, gingival edema and bleeding, thin and fragile gingival mucosa, and areas of hyperkeratosis in the region of the vestibular fold.*



Fig. 1.5. *Clinical presentation of periodontal tissue hypertrophy in a 63-year-old man resulting from long-term use of antihypertensive drugs.*

As inflammation progresses in the periodontium, the epithelium of attachment is destroyed and the periodontal pocket (PC) is formed. The pocket in the tooth area has an uneven depth. It is deeper in those areas where the inflammation is more pronounced. Depending on the level of the pocket bottom relative to the edge of the alveolar bone, gingival pockets are distinguished:— supra-osseous (supraossal), — intraosseous (intraossal). The structure of the gingival pocket may be:— one—sided,- encompassing There are several sides of the tooth, with an entrance to the pocket on each side, which is curved around several sides, but the entrance to it is located on one side.

Bone pockets are located near the tooth.:— unilateral,— bilateral,— trilateral,— quadrilateral (circular). Levels of bone atrophy:— up to the level of the root divergence,— the level of the root divergence above the gingival margin,— 1/2 internally The surface of the root is located above the gum. In the second and third types, there is a through-hole of the intercornular bone. To determine the depth of the gingival pockets, special graded probe, electronic sensing devices. When estimating the pocket depth, higher values of are taken into account.

Gum recession

Gum recession is a decrease in the volume of gum tissue and, as a result, root exposure. Causes of gum recession:

- short lip frenules, buccal-alveolar cords, shallow vestibule of the oral cavity,
- non—physiological position of teeth,
- unsatisfactory direct and indirect dental restorations,
- aggressive brushing,
- poor oral hygiene,
- prolonged course of the inflammatory process in periodontitis,

— traumatic gum damage.



Fig. 1.6. Clinical presentation of chronic generalized periodontitis of severe degree in the remission stage in a 49-year-old woman: hyperemia, gingival edema and bleeding, gingival recession, and secondary deformation of the dental arches.

Classification of gum recessions by Miller (1985):

Class I — recession that does not reach the mucogingival junction, there is no loss of intraproximally gum and bone tissue: IA subclass — narrow, IB subclass — scabby;

class II — gum recession, spreading apically to the mucogingival junction, loss of intraproximal gum and bone tissue is absent: Division IIA — narrow, division IIB — wide;

Class III — gingival recession of class I or II with partial loss of "intraproximally" gum and bone tissue, the gum in the interdental spaces is apical of the cement-enamel joint; class IV — loss of gum and bone in the interdental spaces: Division IVA has a limited number of teeth, and division IVB has generalized teeth.

Tooth mobility

Tweezers are used to measure tooth mobility. Pressure is applied alternately with vestibular pressure and the palatal (lingual sides). Normally, clinical mobility is not noticeable.

Degrees of tooth mobility:

Grade 1 — tooth mobility of up to 1 mm in the vestibular and lingual directions,

Grade 2 - tooth mobility of more than 1 mm in both directions,

Grade 3 — tooth mobility of more than 1 mm in both directions with easily defined vertical movements. *Additional methods:* determination of hygiene indices, periodontal indices. Microbial plaque, associations of microorganisms and products of their metabolism are etiopathogenetic factors that induce inflammation in periodontal tissues. Dental plaque is easy to detect and quantify based on chemical reaction or sorption of plaque polysaccharides in the dye.

To detect plaque, the following are used:

- tableted dyes (erythrosin, Dinal),
- fuchsin solutions for rinsing,
- solutions for lubricating the tooth surface (Lugol or Schiller-Pisarev solution),
- Ketchke solution,
- methylene blue.

Simplified Oral Hygiene Index — OHI (OHI-S) (Green, Vermillion, 1964)

The index allows you to determine the presence of plaque and tartar separately. To determine the index, 6 teeth are examined: vestibular surfaces of teeth 1.6, 1.1, 2.6, 3.1, lingual surfaces of teeth 3.6, 4.6. The assessment is carried out using staining solutions or visually with a probe. Plaque index value:

0 — no plaque,

- 1 — plaque covers no more than 1/3 of the tooth surface,
- 2 — plaque covers up to 2/3 of the tooth surface,
- 3 — plaque covers more than 2/3 of the tooth surface.

The value of the index calculus:

- 0 — any the stone is not identified,
- 1 — Not cheap any stone, plating no more than 1/3 of the tooth surface,
- 2 — Not cheap any stone, plating 1/3-2/3 of the tooth surface, or separate by othlo-Genis subgingival plaque in the cervical region of the tooth,
- 3 — supragingival dental stone covering more than 2/3 of the tooth surface, or significant deposits of subgingival stone around the cervical region of the tooth.

The index is determined by adding the codes obtained during the detection of plaque and tartar:

ISN = sum of the index of each tooth / 6

ISK = sum of the index of each tooth / 6

IG = ISN + ISK

The values of the "OUT" and "OUT" indicators are:

0-0.6 — good

0,7-1,8 — satisfactory,

1,9-3,0 — bad.

The UIG evaluation criteria are:

0-1,2 — good hygiene level,

1,3-3,0 — satisfactory,

3,1-6,0 — poor.

The Fedorov — Volodkino hygiene Index.

It is based on a point estimate of the area of the vestibular surface. Six front teeth of the lower jaw (4.3, 4.2, 4.1, 3.1, 3.2, 3.3) the Schiller-Pisarev solution. The index is useful when examining children in organized children's groups. The presence of a raid is assessed using point codes:

- 1 — plaque is not detected,
- 2 — staining 1/4 of the surface of the tooth crown,
- 3 — staining 1/2 of the surface of the tooth crown,
- 4 — staining 3/4 of the surface of the tooth crown,
- 5 — staining all the surfaces of the tooth crown.

To assess plaque, the score codes are added and the amount obtained is divided by the number of teeth Evaluation criteria:

- 1,1–1,5 — good hygiene level,
- 1,6-2,0 — satisfactory,
- 2,1-2,5 — unsatisfactory,
- 2,6-3,4 — bad,
- 3,5-5,0 — very bad.

The qualitative assessment is based on a three-point system.

- 1 — no staining,
- 2 — moderate staining,
- 3 — intense staining.

The index of effectiveness of oral hygiene (RNR)

To quantitatively assessment of plaque stained 6 teeth: the vestibular surface of the teeth 1.6, 2.6, 1.1, 3.1, lingual surface of the teeth 3.6, 4.6. The examined

surface of each tooth is divided into 5 segments: medial, distal, mid-occlusal, Central, mid-cervical. Codes and criteria for plaque assessment:

0 — no staining,

1 — staining has been detected.

Having determined the code (score) for each tooth, the index is calculated by adding the scores of the colored segments. The values obtained are summed up and divided by the number of teeth examined. The index is calculated using the formula:

$RNR = \frac{\text{the sum of the scores of all teeth}}{\text{the number of teeth examined}}$

Evaluation criteria:

0 — excellent hygiene level,

0,1-0,6 — good,

0,7-1,6 — satisfactory,

1,7 – more — unsatisfactory.

The following indices are used to assess the periodontal status:

— the Schiller-Pisarev test.

— the PMA index,

— the index of bleeding according to the medical history of Kötzhcke (1975),

— the index of gingivitis Silness, Loe (1967),

— the Russel periodontal index,

— the index of the need for treatment of the disease of parodontia (CPITN).

Schiller's Test-Pisarev's Test

Schiller-Pisareva implies a lifetime staining of gum glycogen, the content of which increases with inflammation. For this purpose, the gingival edges are lubricated with a cotton swab soaked in an iodine-containing solution. The sample

is evaluated in points in the form of a single number, which depends on the staining of the gum:

pale yellow color — 0 points,

brown color of gingival papillae — 2 points,

marginal gum — 4 points,

alveolar — 8 points.

The iodine number is calculated using the formula:

The sum of the grades for each tooth.

Number of teeth examined (6)

Evaluation of values:

up to 2,3 points — a mild inflammatory process,

2,6-5,0 points — a moderate inflammatory process,

5,33-8,0 points — an intense inflammatory process.

The RMA Index

The inflammatory process is assessed by the degree of staining the gums with an iodine-containing solution.

Evaluation criteria:

0 — there is no inflammation,

1 — gingival papilla inflammation,

2 — marginal gum inflammation,

3 — alveolar gum inflammation.

Total points * 1003 * number of teeth.

Assessment of values:

25-30% — limited prevalence of the inflammatory process, mild gingivitis;

30-60% — significant prevalence, moderate gingivitis;

more than 60% — increased severity of the inflammatory process, severe gingivitis.

Bleeding index according to the medical history of Kötzhke (1975) grade 1 — bleeding occurs rarely, mainly when eating solid food, grade 2 — bleeding during brushing teeth, grade 3 — spontaneous bleeding.

Index of gingivitis Silness, Loe (1967).

This index can be used to quantify and determine the extent of inflammation. The gum is examined in the dental area 1.1, 1.6, 2.4, 3.1, 3.6, 4.4.

The criteria for evaluating the index are:

0 — no inflammation,

1 — mild inflammation (slight discoloration),

2 — moderate inflammation (edema, hyperemia, possibly hypertrophy),

3 — severe inflammation (severe hyperemia, ulceration).

The condition of the 4 gum surfaces of each tooth is determined, the sum of the estimates is divided by 4:

$IG = \text{sum of the values of each tooth} / 6 \text{ (number of teeth)}$

IG interval according to the severity of gingivitis:

0.1–1.0 — light,

1.1–2.0 — medium,

2.1–3.0 — heavy.

The Russel periodontal Index (1956).

It is designed to identify the developed forms of the disease. The periodontal condition of each tooth is determined from 0 to 8 points. In doubtful cases, they give the lowest possible rating. The index is calculated using the formula:

The sum of each tooth's grades is the number of teeth examined.

Evaluation criteria:

0 — there are no signs of inflammation;

1 — mild gingivitis, part of the gum is inflamed, there are no X-ray changes;

2 — gingivitis (inflammation in periodontal tissues without disruption of the gingival joint, no X-ray changes are detected);

4 — the initial degree of resorption of the tips of the interdental septa, revealed by X-ray examination;

6 — formation of a gingival pocket, epithelial attachment is damaged; chewing function is not impaired, the tooth is not displaced; Radiologically, horizontal resorption of the alveolar interdental septum is determined, reaching 1/2 of the root length;

8 — periodontal tissue destruction with loss of chewing function is pronounced, the tooth is mobile, may be displaced; The X-ray shows resorption that exceeds 1/2 of the root length, and there may be an intraosseous pocket.

Evaluation of values:

0-0.1 — clinically normal gum,

0.1-1.0 — gingivitis,

1.5-4.0 — moderate periodontitis,

4.0-8.0 — severe periodontitis.

**The index of the need for treatment of periodontal diseases — CPITN
(Community Periodontal Index of Treatment Needs).**

The index is designed to determine the prevalence and intensity of periodontal diseases, plan and evaluate the effectiveness of prevention programs. It is proposed to distinguish 3 sections on each jaw: frontal and lateral. The boundary between them runs at the level of the canine and premolar. In adults, starting from the age of 20 and older, 10 teeth are examined. (1.7, 1.6, 1.1, 2.6, 2.7, 3.1, 3.6, 3.7, 4.6, 4.7). For examination by WHO experts, it is proposed a special probe marked with a dark part at the level of 3.5–5.5 mm, the probe weight is 25 grams.

Point evaluation:

Code 0 is healthy tissue,

Code 1 is bleeding observed during or 10-30 seconds after probing,

Code 2 is tartar (overhanging plaque—retaining fillings) detected during probing,

Code 3 is a periodontal pocket of 4 or 5 mm,

Code 4 is a periodontal pocket with a depth of 6 mm or more,

Code X — there is only one tooth in the sextant or there are no teeth.

To determine the need for treatment of periodontal diseases, the following criteria are taken into account::

0: code 0 or X — there is no need for treatment;

1: Code 1 — oral hygiene training using hygiene indices as a control;

2: a) Code 2 — professional hygiene and oral hygiene training; b) Code 3 — professional oral hygiene and comprehensive treatment (open and closed curettage);

3. Code 4 — professional oral hygiene and complex therapy (flap surgeries, orthopedic treatment).

Epithelial Attachment Loss Index CAL (Clinical Attachment Loss)

The amount of epithelial attachment loss (CAL) = depth of probing \pm deviation of the level of the outer edge from its physiological norm. The amount of epithelial attachment loss is measured in mm. The values are added if there is a gum recession, which is the amount of epithelial damage- the attachment increases. The values are subtracted if gum hypertrophy is observed — the amount of loss of epithelial attachment decreases.

Additional methods: instrumental research.

X-ray examination method.

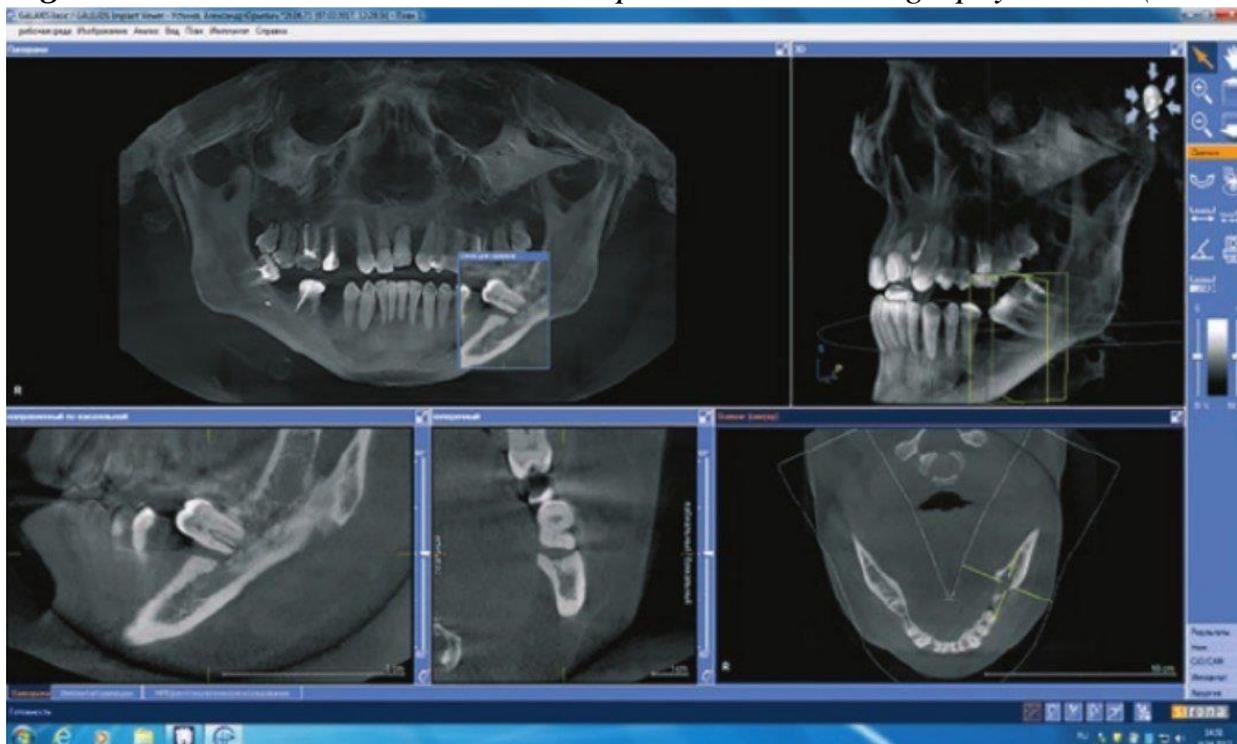
The X-ray method occupies a key place in the diagnosis of periodontal diseases, because it allows you to identify the degree of damage to bone tissue, the nature of the process. There are 4 degrees of destruction of the bone tissue of the alveolar part of the jaw: the initial one is the absence of a compact plate on the tops of the interdental septa, its osteoporosis without pronounced loss; grade I — destruction of the interdental septa up to 1/3; grade II — destruction of the interdental septum by 1/2; grade III — destruction covers 2/3 of the interdental septum and more. Two-dimensional and three-dimensional X-ray examinations are



used.: 2-dimensional orthopantomography (OPTG)), 3—dimensional cone beam computed tomography (CBKT) (cone beam computer tomography (CBCT)).

Fig.1.7. Orthopantomogram

Fig.1.8. Cone-beam computed tomography (CBCT)



Cone beam computed tomography is a much more accurate and reliable method compared to two-dimensional imaging methods for assessing furcation defects, intraosseous destruction, height of the alveolar bone ridge and periodontal ligament space. The disadvantages of using CBCT include the economic aspect and the high radiation dose compared to two-dimensional imaging methods.

Electrodontometry.

Electrodontometry is a method for determining changes in the electrical excitability of the pulp during the development of periodontitis as a result of involvement of the neurovascular bundle of the tooth in the process. In the initial stages of periodontitis, the electrical excitability of the pulp is increased (1-1.5 Ua), with the progression of the process, the electrical excitability of the pulp decreases (20 Ua). With a prolonged course of the disease, this indicator is 30-40 μ A.

Determination of capillary resistance (Kulazhenko test).

The sample is used to study the degree of interstitial hemorrhage due to the damaging effect of negative pressure. The appearance of hemorrhage is associated with a violation of capillary permeability. When evaluating the results, the amount of negative pressure and the time of hematoma formation are taken into account. The sample is carried out when a residual pressure of 40 mmHg is created in a glass or plastic tube with a diameter of 5 mm, which is applied to the mucous membrane in the area of the movable gum. At a dilution of 720-740 mmHg, vacuum hematomas form in 50-80 seconds in a healthy person aged 20-40 years. With gingivitis, hematomas appear in 15-20 seconds, with generalized periodontitis in 5-10 seconds. At the same time, vacuum diagnostic hematomas have a therapeutic effect similar to the effect of autohemotherapy, stimulate enzymatic activity and regeneration of periodontal tissues.

Laser Doppler flowmetry.

Laser Doppler flowmetry (LDF) is a method of studying blood circulation in the vascular system. The method is based on the fact that when interacting with tissue, the reflected signal has a component due to reflection from moving red blood cells, proportional to the speed of movement (Doppler effect). During LDF, the microcirculation index is measured, which is an integral characteristic of the periodontal blood supply. The LDF method makes it possible to evaluate the components of microvascular tone based on the amplitudes of microvascular current fluctuations, which are caused by the intensity of contractions of the muscular wall of the vessel, and hence the diameter of the vascular lumen. The depth of probing of tissue by radiation waves for different types of biological tissues is approximately 1-3 mm. In this case, as a rule, only small venules, arterioles, arteriovenous shunts and capillaries enter the examination area. In LDF of periodontal tissues, the bypass index (PS) can be estimated due to the spatial localization of the effects of the neurogenic mechanism (arterioles and arterial shunt site are the target) and the myogenic mechanism (precapillaries are the target). PS increases with an increase

in myogenic tone. Against the background of normal or decreased neurogenic tone, most of the blood flow bypasses the nutritional link of the microcirculatory system.



Fig. 1.9. Method of laser Doppler flowmetry

Rheoparodontography.

Rheoparodontography is the determination of the functional state of periodontal tissues. The method is based on recording the electrical resistance of tissues to the passage of high-frequency current through them, which is associated with changes in blood supply and blood flow velocity.

Polarography.

Polarography is the determination of the state of redox processes in periodontal tissues and the severity of hypoxia. The PA-2 and PA-3 polarographs are used to study the oxygen stress level in periodontal tissues. The normal oxygen voltage (pO₂) is 40 units. In periodontal diseases, this indicator decreases to 34-36 units due to a violation of the tissue's ability to utilize oxygen. Redox processes in them are sharply reduced.

Densitometry.

Densitometry is a study of bone mineral density.

Types of densitometry :

- ultrasound,
- X-ray.

Depending on the technology, it is possible to examine the lumbar vertebrae, femoral neck, tibia and radius, and phalanges of the fingers.

Indications:

- 1) women in the first few years after menopause (especially after ovarian removal);
- 2) all people over the age of 40 who have had one or more fractures unrelated to serious injury (car accident, fall from a great height, sports injuries);
- 3) people taking glucocorticoid hormones (prednisone), thyroid hormones for a long time (more than 6 months);
- 4) people who have suspected osteoporosis during X-ray examination of bones;
- 5) people receiving drug therapy for osteoporosis to control the effectiveness of treatment;
- 6) people whose height has decreased by 3 cm or more;
- 7) people who drink alcohol regularly (1 time a week or more), who smoke more than 1 pack of cigarettes a day.
- 8) people who often suffer from diarrhea.

The T-score is the difference between the indicators of bone mineral mass and bone density in the subject and the average theoretical peak of these indicators at the age of 40 years. The T-index does not depend on age; It is he who is most important in making the diagnosis of osteoporosis. WHO has determined the following parameters for assessing the severity of osteoporosis based on bone mineral density (BMD) data.

— Norm —

the T-criterion is greater than or equal to -1. Bone mineral density is within one standard deviation from the "young" adult norm.

— Low bone mass (osteopenia) —

The T-criterion is between -1 and -2.5. Bone mineral density is between 1 and 2.5 standard deviations from peak bone mass.

— Osteoporosis — The T-criterion is equal to or less than -2.5. Bone mineral density is 2.5 or more standard deviations from peak bone mass. Women in this group who have one or more fractures are considered to have severe or severe osteoporosis. This study should be repeated no more than once a year, as the process of changing bone density is slow. Normally, after 55 years of age, a person loses about 1% of bone density per year. If a repeat examination reveals a higher rate of loss, then the patient should consult a doctor and actively engage in the prevention of osteoporosis.

Florida Probe — computer system for conducting a complete clinical diagnosis of periodontal diseases and motivating the patient to cooperate. The Florida Probe was established in 1988, and after repeated clinical trials, it was approved by the American Dental Association's Council of Science in 1998. The depth of the periodontal pockets is measured using a special electronic sensing device connected to a personal computer. The use of such a probing device makes it possible to eliminate the subjectivity of measurements. In the course of the study, indicators of bleeding, suppuration, tooth mobility, and plaque are also entered. Such an examination should be carried out at the initial admission, during preventive examinations, and during repeated visits. This technique allows you to reduce the examination time by 3-4 times, systematizes the work with the patient.

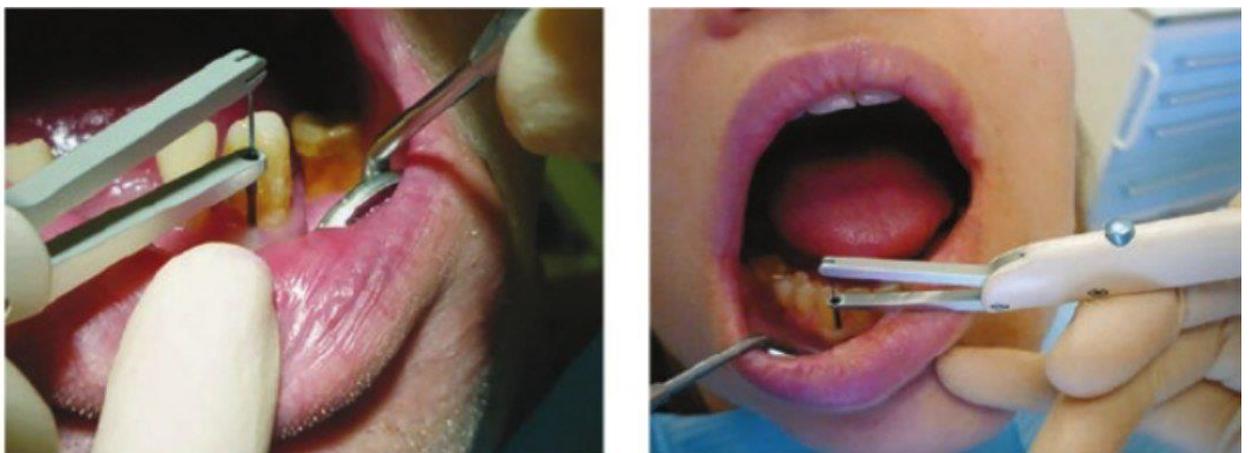


Fig.10. Examination of periodontal tissues using an electronic probing device

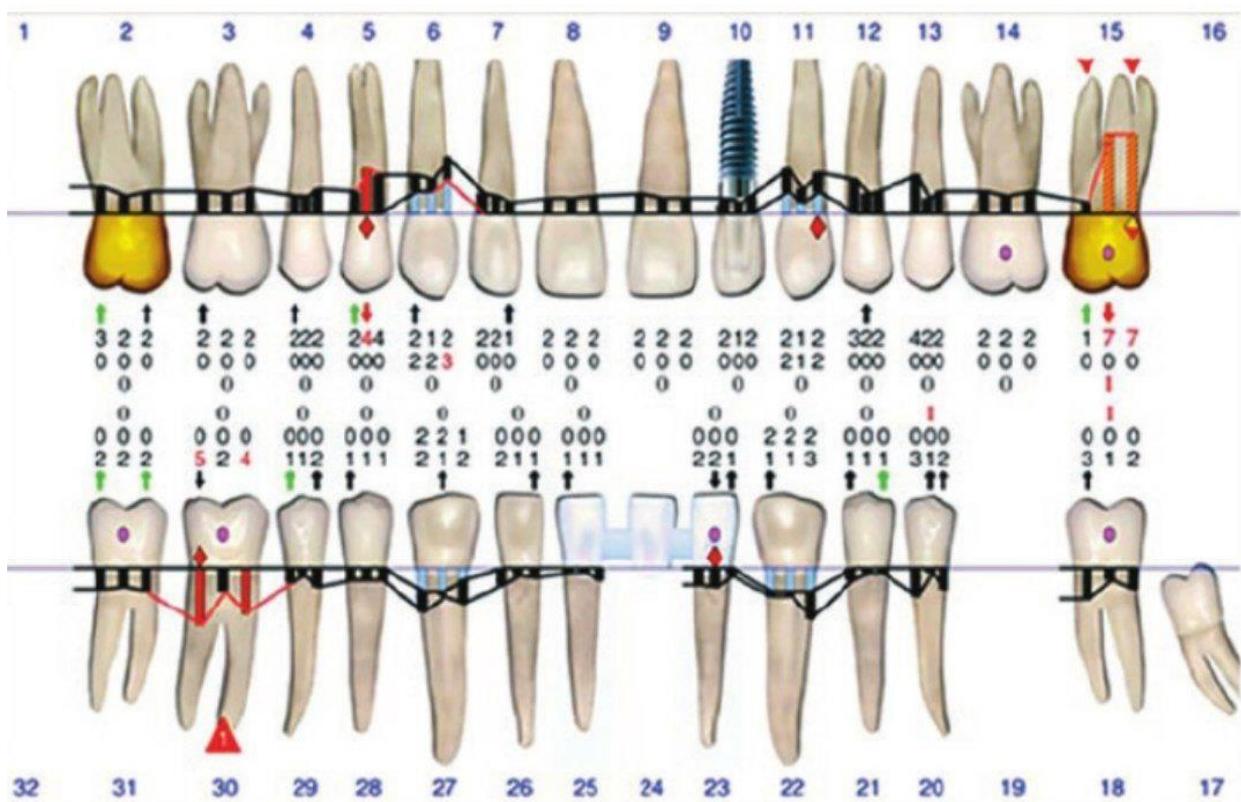


Fig .11. Periodontal chart “Florida Probe”

The information content of the card is provided by a system of visual and easily interpretable clinical color codes. The analysis of repeated studies is automatically displayed as arrows to decrease or increase the indicator. The patient can easily sort out the information provided by himself. The periodontal card is given to the patient, which contributes to a deeper understanding of the problem. The program is accompanied by a speech interpretation of the examination results. At the same time, simple and understandable words are used, which is especially important for the patient's perception of information. Color graphic tables and speech accompaniment make it possible to achieve a deep psychological impact on the patient, change his attitude to the existing disease, and stimulate the patient's responsible attitude to following the doctor's recommendations. Subconsciously, the patient trusts the doctor more, who uses the latest achievements of science and technology in his work.

1.2. Treatment of periodontal diseases

Drawing up a comprehensive treatment plan. The treatment plan for a periodontal patient should be comprehensive, personalized, controlled, and economically feasible. The patient's treatment begins with oral hygiene training and the selection of individual hygiene products. Then the supragingival and subgingival dental deposits are removed. After that, the oral cavity is sanitized, orthodontic preparation and prosthetics are performed, then the patient is under medical supervision. It is important to note that chronic periodontitis is irreversible. This disease does not undergo reverse development, but can only be stabilized as a result of significant efforts by dentists of all profiles, the use of a complex of therapeutic measures and remedies. The success of periodontal treatment depends on mutual understanding between the patient and the doctor, the patient's awareness of the causes of the disease and the need for high-quality and accurate implementation of prescribed recommendations.

The principles of complex treatment of patients with chronic periodontitis provide for the simultaneous solution of several tasks:

- relief of inflammatory processes in the joint,
- prevention of further development of the pathological process,
- preservation and restoration of the function of the dental system,
- prevention of the development of general and local complications,
- prevention of negative effects on the general health and quality of life of patients.

Therapeutic (non-medicinal and medicinal), surgical, orthodontic and orthopedic treatment is used in the complex treatment of periodontal diseases.

Therapeutic treatment of periodontitis is based on the use of non—surgical methods, is the basic stage of complex treatment of periodontal diseases and is aimed at eliminating one of the etiological factors of the disease - bacterial biofilm and factors ensuring its accumulation on the tooth.

It includes:

- carrying out professional oral hygiene;
- individual oral hygiene training and control;
- removal of supra- and subgingival dental deposits;
- correction and elimination of factors,
contributing to the maintenance of inflammatory processes in the periodontium
(overhanging edges of fillings, carious cavities, wedge—shaped defects);
- elimination of premature contacts (functional selective grinding);
- appointment of antimicrobial and anti-inflammatory therapy.

Surgical treatment is aimed at eliminating foci of inflammation that could not be eliminated at the stages of therapeutic treatment. Elective surgical procedures are performed after preliminary preparation as part of basic therapy.

Orthodontic treatment is aimed at elimination of dental anomalies and secondary deformations of the dentition, stabilization of pathological processes in the periodontium.

Orthopedic treatment is aimed at restoring the function of the maxillary system, restoring the integrity of the dentition, stabilizing pathological processes in the periodontium, and creating conditions for the functioning of the maxillary system in a compensated state. It includes the manufacture of removable and/or non-removable splinting orthopedic structures.

Physiotherapy provides faster and more effective rehabilitation of patients with periodontal diseases, and increases the duration of remission periods. Dynamic follow-up of patients is carried out after 1, 2, 6 weeks to monitor oral hygiene and determine periodontal status, and then every 6 months.

Orthopedic treatment.

Restoring the integrity of the dentition is an important aspect of the comprehensive treatment of periodontal diseases.

Rational prosthetics is performed for the following purposes:

- elimination of functional overload existing teeth by restoring missing ones (for example, the anterior group of teeth is often subject to functional overload in the absence of lateral ones);
- uniform distribution of chewing pressure in the dentition,
- splinting of teeth using orthopedic structures in order to eliminate occlusive trauma of teeth with mobility,
- restoration of aesthetic parameters.

Orthopedic structures by time the uses can be temporary or permanent, according to the type of prosthesis.

- removable and non-removable.

Removable structures: partial plate prosthesis, full plate prosthesis, adhesive prosthesis, shoulder prosthesis.

Non-removable structures: pin tabs, artificial crowns, crown blocks, bridges, dental implants.

1.3. Tactics of a general dentist for periodontal diseases

Modern criteria of personalized medicine determine the approach to the selection and implementation of therapeutic and preventive measures against periodontitis, taking into account the dental status, the general condition of the body and the characteristics of existing risk factors (bad habits, nutrition, genetics, personal hygiene skills, properties of oral hygiene products used; local factors contributing to the maintenance of the inflammatory process, occupational hazards, climatic and geographical factors, somatic diseases, etc.).

The problems of dentistry, on the one hand, should be complex, and on the other — as individualized as possible. It is at this first stage that the future prognosis for the entire human dental system often depends on the correct tactics of the dentist. Unfortunately, in clinical practice, the choice of a doctor often occupies one of the marginal positions: either total tooth extraction with subsequent problems with prosthetics, or, conversely, dental preservation in the absence of periodontal treatment as such. The situation is aggravated by the fact that the treatment of such patients requires the participation of almost all dental specialists, and the severity of existing problems requires highly qualified doctors. In most cases, the first stage is a surface cleaning of dental deposits.

Often, this manipulation is performed by a clinic hygienist with secondary medical education. It should be noted that in the case of severe periodontitis, such tactics are unacceptable, because they inevitably lead to low effectiveness of the treatment, increase the likelihood of local and general complications, and complicate the planning of further treatment measures. Patients, failing to see a significant improvement in the condition of their gums, lose confidence in the team of specialists and abandon recommended therapeutic measures. Therefore, knowledge of the specifics of managing patients with severe inflammatory periodontal diseases plays an extremely important role both in achieving clinical success at the initial stage of treatment and in planning further comprehensive dental rehabilitation.

The first stage of treatment of patients with periodontal diseases should begin with a detailed conversation. During this period, the doctor should receive comprehensive information about the patient's health status, medication intake, nutrition and oral hygiene. Special attention is paid to allergic diseases, diseases of the blood system with impaired coagulation, and the rate of wound healing (regeneration can be inhibited against the background of diabetes mellitus, taking cytostatics, immunosuppressants, and hormones; the risk of jaw necrosis is sharply increased when taking medications from the biphosphonate group, etc. Despite the banality of this stage, it must be remembered that only the most detailed information

to the doctor about the patient's health status will help in the future to prevent the occurrence of serious complications in the form of unforeseen bleeding, suppuration or extensive necrosis of periodontal tissues.

During the examination of the patient, a periodontal chart is filled out with a detailed indication of the depth of the periodontal pockets, the degree of gum recession, tooth mobility, the degree of furcation damage, etc. Hygienic and periodontal indices are evaluated, as well as, if possible, the index of bleeding gums. It is better to photograph the patient's oral cavity before treatment and at the stages of complex therapy. Given the constant increase in the legal literacy of patients, the increasing frequency of cases of defending their rights in court and the high cost of dental treatment, this stage is of particular importance.

TOPIC 2. IATROGENIC FACTORS IN THE DEVELOPMENT AND PROGRESSION OF PERIODONTAL DISEASES AND THE TACTICS OF THE GENERAL DENTAL PRACTITIONER FOR THEIR PREVENTATION AND ELIMINATION. OCCLUSION CORRECTION(SELECTIVE GRINDING, DIGITAL OCCLUSIOGRAPHY - T-SCAN, AI TECHNOLOGIES)

The purpose of the lesson: to study the causes of traumatic occlusion, its types; to get acquainted with the picture of primary and secondary traumatic occlusion; to study orthopedic treatment methods for periodontal functional overload.

2.1. Traumatic occlusion is a closure of the teeth that causes a functional overload of the periodontium (Shtilman).

Primary traumatic occlusion is an increased chewing load experienced by a healthy periodontal.

Secondary traumatic occlusion – masticatory pressure becomes traumatic not because it has changed in direction, magnitude, or duration of action, but because the presence of pathology in periodontal tissues (periodontitis, periodontal disease) has made it impossible for it to perform normal functions. Inflammatory or dystrophic processes in the periodontium make it unable to take a load that was previously adequate.

In the occurrence and progression of inflammatory and dystrophic periodontal diseases, not only general, but also local factors. One of the latter is periodontal functional overload. At a certain stage in the development of the disease, functional overload becomes one of the leading factors in pathogenesis, resulting in traumatic occlusion and traumatic articulation.

Functional living conditions are created for different groups of teeth.

Periodontal injury is a rapid unidirectional, prolonged chewing pressure.

The traumatic node (Fig. 1) is an acute periodontal insufficiency that manifests itself with minimal chewing pressure and abnormal tooth mobility.

A direct traumatic node is a manifestation of traumatic occlusion in a section of the dentition directly (directly) associated with periodontal insufficiency in this area.

A reflected traumatic node is a manifestation of traumatic occlusion in a section of the dentition directly, not directly related to periodontal insufficiency in this area, but resulting from anatomical changes in other areas of the dentition.

There is a functional center, a site of traumatic occlusion, and a non-functioning link, the atrophic unit.

The functional center (Fig. 1) is a group of antagonizing pairs of teeth, which chew food without injury to the periodontium (due to the presence of physiological reserve forces of the periodontium).

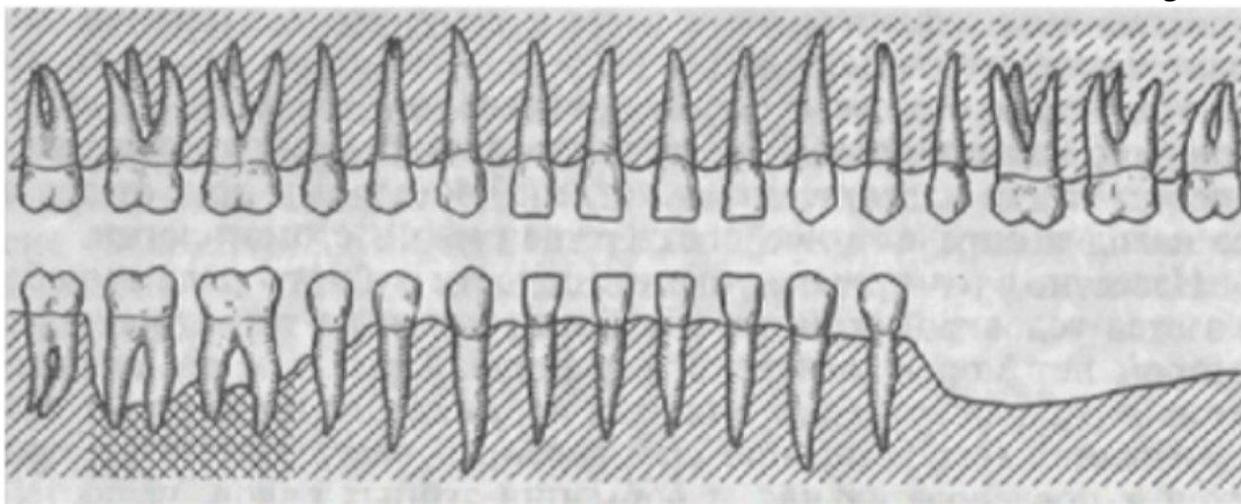
The functional center is unstable and may move depending on the functional load. Because of its mobility, it is also called a relative functional center.

The atrophic unit (fig. 1) is a non-functioning link. This teeth that have no antagonists. Atrophic processes occur in periodontal and dental pulp devoid of antagonists. Deformations occur most often in the atrophic link (Popov–Hodon phenomenon).

The site of traumatic occlusion is the area of the dentition with the greatest manifestation of functional insufficiency (traumatic node). The teeth forming traumatic occlusion are in a state of functional overload.

The site of traumatic occlusion can be frontal, sagittal, frontosagittal, or parasagittal in localization and the cross. It can be single or multiple. Clinical symptoms include dislocation of teeth, deformity of the occlusal curve, and all the symptoms characteristic of periodontitis.

Fig.2.1.



Functional center

Traumatic node

Atrophic unit

An increase in functional stress causes a restructuring of the chewing apparatus, its adaptation to new conditions.

The compensation stage is manifested in the form of:

- increased blood circulation;
- an increase in the number and thickness of Sharpey periodontal fibers;
- the presence of hypercementosis (Fig. 2);

Fig.2.2. Hypercementosis



- osteosclerosis;
- teeth subject to functional overload may they can be embedded in the alveolar part, creating a toothalveolar shortening (V.N. Trezdubov) (Fig.2.3);



Fig.2.3. Dental alveolar shortening

- teeth can turn and tilt in different directions, often remaining stable at the same time (Fig.2.5)

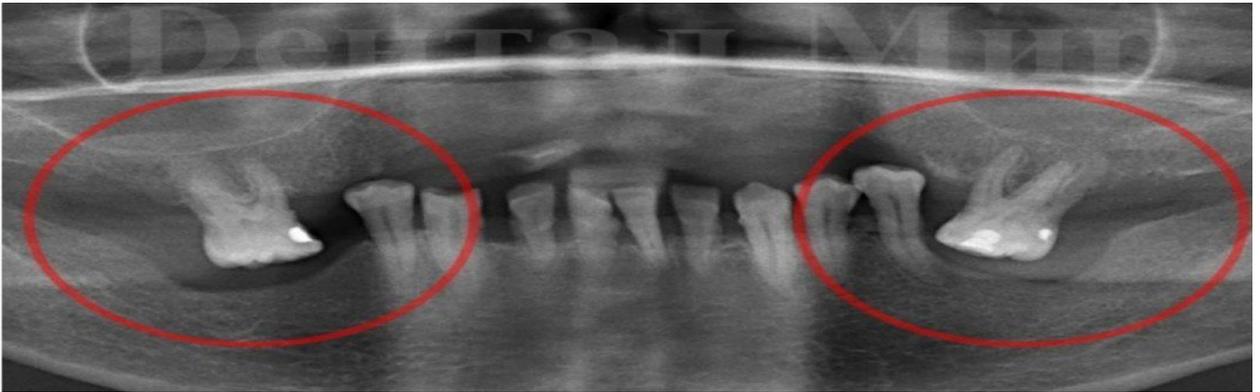


Fig.2.5. Rotations and tilts of teeth in different directions

- localized, at the site of overload, increased abrasion of the hard tissues of the teeth (Fig.,2.6).



Fig.2.6. Pathological erasure

The periodontal's ability to adapt to increased functional load determines its compensatory capabilities, safety margin or reserve forces (E.I. Gavrilov). The latter depend on the individual characteristics of the human body. If the cause of the overload is eliminated at the compensation stage, the changes that have occurred in the periodontium may disappear. If this does not happen, periodontal dystrophy occurs.

The decompensation stage manifests itself as a traumatic syndrome:

- abnormal mobility, visible to the naked eye;
- extension periodontal cracks and the formation of pathological pockets;
- exposure of the tooth root;
- marginal gingivitis;
- displacement of the tooth
- functional overload;
- extension of periodontal fissure, resorption of the alveolar comb in the form of a bowl.

Periodontal functional overload is aggravated by:

- partial tooth loss;
- maxillary anomalies;
- deformations of the dentition.

It differs not only in its genesis, but also in its pathogenesis.

Therefore, functional overload is distinguished, which is unusual in magnitude, direction, and duration of action.

Traumatic occlusion with an unusual amount of stress develops with: an increase in the interalveolar height on a single seal, tab, crown (premature contact).

In this case, only one tooth is in contact with the antagonists, and the entire force of the contracting chewing muscles is concentrated on it.

A functional load, *unusual in its direction*, develops, for example, on the teeth, on which the retaining clamps are attached. At the same time, a predominantly horizontal load falls on the teeth. Another example is the overload that occurs when the teeth are tilted (deformation of the dentition).

Functional overload, *unusual in time of action*, is observed in violation of the reflex activity of the masticatory muscles, when some patients experience a phase of functional the lower jaw is at rest, and instead of separating, the teeth are closed with a significant force of contraction of the masticatory muscles. This occurs with parafunctions of the masticatory muscles (bruxism). The abuse of chewing gum is another example of an unusual overload in terms of time duration.

In order to plan the correct pathogenetic orthopedic tactics, differentiation of primary and secondary traumatic occlusion is required. The differential diagnosis uses the results of the patient's survey, clinical and radiological data.

Differential diagnosis of traumatic occlusion

	Anamnestic data
1	2
Primary traumatic occlusion	<ul style="list-style-type: none"> - the presence of Bruxism; - Recent dental fillings or prosthetics in the current lesion
Secondary traumatic occlusion	<ul style="list-style-type: none"> - occupational hazards (working in hot shops); - chronic intoxication; - hypovitaminosis (especially vitamins C and P); - systemic diseases (blood diseases, diabetes); - the presence of chronic stress; - complaints of bleeding gums, bad taste, bad breath
	The clinical picture

<p>Primary traumatic occlusion</p>	<p>focality (localization) of the lesion;</p> <p>The presence of dental row defects;</p> <ul style="list-style-type: none"> - rapid pathological erasure; - deformation of the occlusal surface of dentition, fillings and dentures; - blocking points and premature occlusal contacts; - Localized increased tooth erasure; - changing the position of individual teeth (tilts, turns, dental alveolar shortening); - No detachable from pockets; - pockets are found only on the side of the tooth movement (tilt), the periodontal area of which is subject to overload; - The gingival margin is hyperemic in these areas (the area of hyperemia has the appearance of a crescent, bordered by a strip of anemia), is never cyanotic, edematous and does not lag behind the teeth; - teeth sinking into the alveolar bone of the jaw
<p>1</p>	<p>2</p>
	<p>The clinical picture</p>
<p>Secondary traumatic occlusion</p>	<ul style="list-style-type: none"> - it has a diffuse (generalized) character; - delayed tooth erasure or none at all; - Carious activity is low; - but wedge-shaped defects often occur; - there may be pathological gingival pockets with purulent discharge. <p>However, this is not an obligatory feature.;</p> <ul style="list-style-type: none"> - often on the palatine surface in the area of 16 and 26 teeth show deep retraction of the gingival margin with root exposure; - The front teeth fan out, forming

	diastemes and tremors.
	X-ray picture
Primary traumatic occlusion	<ul style="list-style-type: none"> - focality; - the unevenness of the lesion; - Osteosclerosis; - Hypercementosis; - false granulomas; - Uneven, asymmetrical expansion of the periodontal fissure; - The alveolar bone undergoes resorption on the side of the tilt or movement of the tooth; - atrophy of the alveolar ridge in the form of a bowl, in the center of which is the root of the tooth
Secondary traumatic occlusion	the diffuse nature of the lesion is typical, more often with a uniform direction of bone resorption

The differentiation of the two forms of traumatic occlusion is extremely difficult. This is especially the case with partial tooth loss with the preservation of a small number of pairs of antagonistic teeth, or if tooth loss occurred against the background of periodontal disease or diffuse periodontitis. In such cases, they speak of a *combined traumatic occlusion*.

As a result of alveolar resorption, the normal ratio of the extra- and intraalveolar parts of the tooth is disrupted (Fig. 2.7, 8).

The neck is exposed and the extraalveolar part of the tooth (the outer lever) is enlarged.

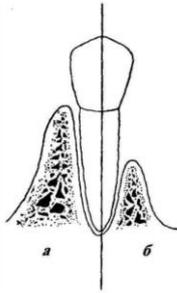


Fig. 2.7. The ratio of crown length to root

a - is the normal ratio of crown length to root;

b – the clinical crown is enlarged due to the exposure of the root.

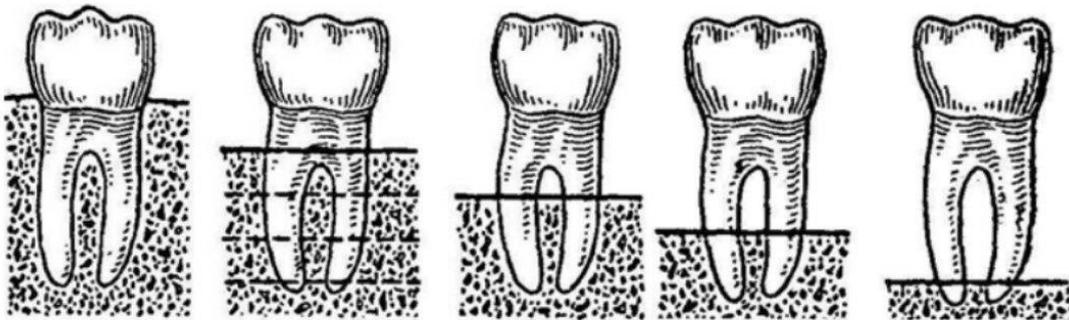


Fig. 2.8. Illustrating the changes in the periodontal reserve forces in periodontitis

2.2. Orthopedic treatment of traumatic occlusion

Orthopedic measures do not eliminate periodontitis and periodontal disease, as their target is traumatic occlusion.

Therefore, orthopedic treatment is of a syndromological nature. In this regard, the purpose of orthopedic treatment for periodontal diseases is to prevent, eliminate or reduce the functional overload of the periodontal, which at a certain stage the disease is one of the main pathogenetic factors determining the course of the disease, and in some cases, it is an independent periodontal disease (traumatic occlusion).

When this goal is achieved, periodontal dystrophy or inflammation develops more slowly. Due to this, therapeutic measures become more effective.

To achieve this **goal**, it is necessary to solve the following tasks:

- to restore the lost unity of the dentition; to transform the teeth from separate acting elements into an inseparable whole;
- properly distribute the chewing pressure on the remaining teeth and relieve the teeth with the most affected periodontitis
- due to the teeth in which it is better preserved;
- to protect teeth from the traumatic effects of horizontal overload;
- perform prosthetics of the oral cavity.

Basic requirements for the treatment of periodontal diseases

1. Comprehensive treatment. The treatment plan should include methods and means aimed at eliminating the symptoms of the disease, normalizing the condition of periodontal tissues and affecting the patient's body as a whole, i.e. the right combination of local and general treatment.
2. Strict individualization of complex therapy, taking into account the type, severity of the disease and the features of the clinical course, as well as the general condition of the patient.
3. A reasonable choice of methods and means of influencing the periodontal lesion and the patient's body as a whole.
4. Observing the correct sequence of application of various methods and means of complex therapy.
5. Carrying out repeated courses of treatment during remission in order to prevent exacerbation of the chronic process.
6. Carrying out rehabilitation measures.
7. Organization of medical examination.

Orthopedic treatment should be started simultaneously with therapeutic treatment, but after the necessary rehabilitation procedures have been carried out

(removal of dental deposits, removal of destroyed teeth and roots that cannot be repaired, removal of inflammatory layers). Next, measures are taken to normalize occlusion by grinding off premature contacts of cutting surfaces and dental tubercles, orthodontic measures, prosthetics of dentition defects, including splinting.

Methods used in orthopedic dentistry

- selective grinding;
- temporary splinting;
- orthopedic techniques;
- the use of permanent splinting devices and prostheses;
- direct prosthetics and splinting.

Orthopedic methods used to treat periodontal diseases can relieve inflammatory phenomena, improve blood circulation and tissue trophism by eliminating pathological mobility, normalizing occlusal ratios, and relieving the traumatic effects of chewing pressure.

Course of treatment

1. Alginate mass is used to remove impressions from the upper and lower jaws for diagnostic models.
2. Plaster models are cast from the resulting prints.
3. Next, the central occlusion is determined.
4. After that, the diagnostic models are fixed in the articulator using the facial arch.
5. Next, determine the treatment plan.
6. Dental rehabilitation, stage epicrisis and refinement of the treatment plan.

The facial arch is a device used to transfer the position of the plaster model of the jaw into the inter-frame space of the articulator relative to its opening axis, as the dentition is oriented relative to the skull and condyles of the lower jaw

Fig. 2.9.

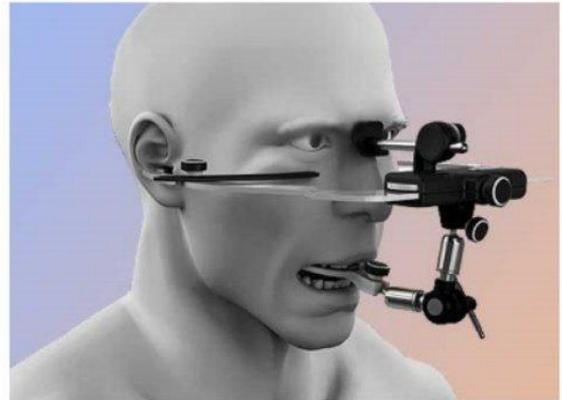


Fig. 2.10. Articulator

(an apparatus reproducing the movements of the lower jaw)



Fig. 2.11. Articulator with a facial arch

Defining a treatment plan

If the patient has the initial stage of periodontitis and early contacts are detected, then properly carried out selective grinding of teeth can prevent further progression of the disease. Selective grinding improves the clinical picture of the disease, as the movements of the lower jaw become more physiological.

If there is an already developed stage of periodontitis, where there is mobility of teeth of II–III degrees, defects in the dentition, deep gingival pockets, only selective sanding will be ineffective. It must be combined with splinting.

Splinting is understood as combining several teeth or the entire dentition into a block with some kind of orthopedic device - a splint. Splints can serve as complete crowns, equator crowns, half crowns, rings, caps and splinting medical devices with various combinations of support and retaining clamps soldered together. With the help of a splint, it is possible to combine teeth into a common system that protrudes when chewing pressure is perceived as a whole.

Functional overload of teeth in periodontal disease, as already noted, it does not occur immediately, but gradually. Therefore, it is important to determine the time of its appearance based on certain clinical signs. Such a symptom is the pathological mobility of the teeth, indicating a decompensated periodontal

condition. Splinting can also be performed in the later stages of the disease, but the best therapeutic effect is achieved at the first signs of functional overload.

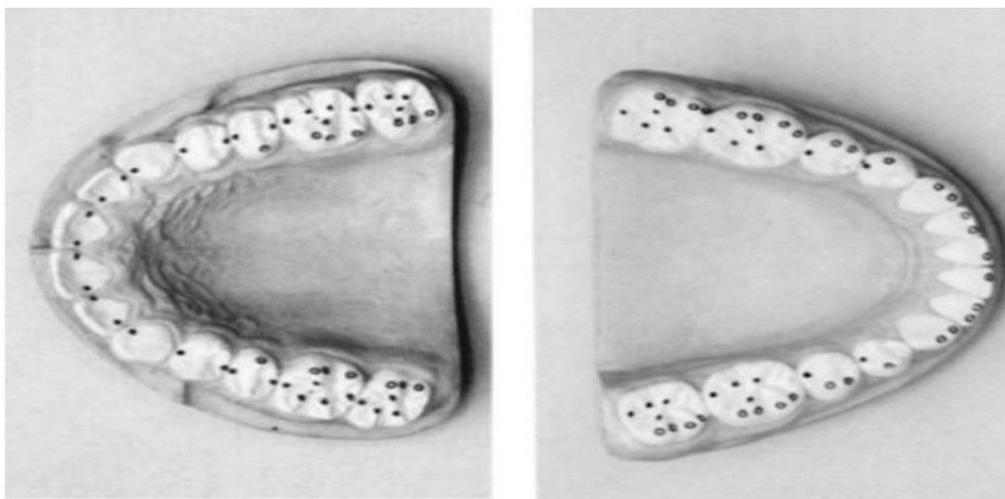
2.3. Selective grinding

The leading role in the pathogenesis of periodontal diseases belongs to traumatic periodontal overload, the elimination of which creates favorable conditions for periodontal function, stabilizes the pathological process, and increases the effectiveness of therapeutic and surgical treatment.

Traumatic periodontal overload occurs as a result of:

- tooth loss;
- dental deformities after tooth extraction;
- delayed erasure of hard dental tissues in periodontal diseases;
- uneven erasure in the pathology of hard tissues.

In this case, areas appear on the occlusal surface of the teeth that prevent multiple tooth contacts in the central, anterior and lateral occlusions. In addition, the inability



to close the rows of teeth in the central occlusion forces the lower jaw to be shifted to the side, which it can lead to a change in occlusion (habitual occlusion), the development of pathological changes not only in periodontal tissues, but also in the masticatory muscles and the temporomandibular joint. Occlusion is recorded using an occlusogram. Typical closure sites are normally shown in Fig. 2.12.

Fig. 2.12. Characteristic areas of teeth closure in normal

To achieve multiple dental contacts, **selective grinding** is used – an important measure in the treatment of periodontal diseases, as well as parafunctional conditions, pathology of the masticatory muscles and the temporomandibular joint.

Indications for selective tooth grinding

1. Periodontal diseases, when occlusion disorders develop due to displacement of teeth due to damage to their supporting apparatus. For periodontitis, therapeutic treatment and resurfacing they are held simultaneously. However, in patients with severe symptoms of exacerbation of inflammatory phenomena in the periodontium, selective resurfacing is better performed after their elimination. If the clinical picture of periodontal disease is dominated by the symptoms of destruction of bone tissue with the formation of pockets, then grinding is performed before surgical operations to eliminate them. With pronounced pathological mobility of the teeth, when supracontact teeth are an aggravating factor, grinding is performed either during or before anti-inflammatory treatment.
2. Prevention of periodontal diseases in people with delayed or absent natural erasure of the hard tissues of the teeth, which can hinder the movement of the lower jaw and cause functional overload.
3. Selective grinding as part of secondary prevention in the initial stages of generalized periodontal disease with intact dentition, when there is no clinically pronounced atrophy of the alveolar process in most teeth, or it is detected only from the palatine side of the sixth upper teeth in the form of gum retraction and slight exposure of the necks.
4. Displacement of teeth with the loss of antagonizing or adjacent teeth also leads to occlusion disorders in the form of premature contacts (supracontacts).
5. Selective grinding of teeth is indicated before correction of the occlusal surface of teeth using fillings, inlays, artificial crowns, bridges, or removable dentures.

6. Diseases of the temporomandibular joints and masticatory muscles, when occlusive obstacles can disrupt the coordinated contractions of these muscles and cause musculoskeletal dysfunction.

7. Correction of occlusion is necessary after completion of active orthodontic treatment of anomalies in the retention period to prevent the development of pathology of the masticatory muscles and joints.

8. Orthopedic treatment using implants requires very careful correction of occlusion, since the appearance of supracontacts on the prostheses creates a functional overload and may cause implant rejection.

Relative contraindications to selective tooth grinding (absolute none)

1. Severe periodontal inflammation. In such a situation, before by grinding, preparatory therapeutic measures must be carried out: to remove dental deposits, to conduct a course of anti-inflammatory periodontal therapy. However, it should be borne in mind that premature occlusal contacts can support an inflammatory response. In these cases, both types of treatment should be performed simultaneously.

2. Pronounced anomalies and deformations of the maxillary system, subject to orthodontic, orthopedic, surgical or combined treatment.

3. Acute and chronic diseases of the temporomandibular joint (TMJ), accompanied by pain syndrome of musculoskeletal dysfunction. In such patients, selective polishing is indicated in remission.

The therapeutic effect of sanding is:

-elimination or significant reduction of the horizontal component of masticatory pressure harmful to a weakened periodontal,

- reduction of spatial displacement of the tooth,

- less compression of periodontal vessels, and, consequently, in the removal of factors impairing blood circulation and tissue trophism.

Functional sanding is used both in the initial and advanced stages of the process.

Normalization of the occlusal and articulatory ratios of the dentition is achieved by:

-shortening the protruding teeth;

-reducing the degree of incisor overlap;

-selective grinding of the slopes of the tubercles, the area of supercontact.

When selectively sanding, you should know that:

- 1) normalization of occlusal ratios should not reduce the height of the lower face;
- 2) traumatic points are detected by moving the lower jaw using occlusive (carbon) paper;
- 3) sanding is carried out using a gentle method;
- 4) the slopes of the cheek tubercles are ground on the teeth of the upper jaw, and the slopes of the lingual tubercles are ground on the lower teeth.;
- 5) the tooth crown is shortened with a diamond disc while securely fixing the tooth.;
- 6) grinding of the hard tissues of the tooth protruding from the occlusion evens the ratio of the crown and root parts and puts the tooth in a favorable functional position.;
- 7) after leveling the occlusal surface, the sanded areas are polished, and then treated with fluorinated pastes.

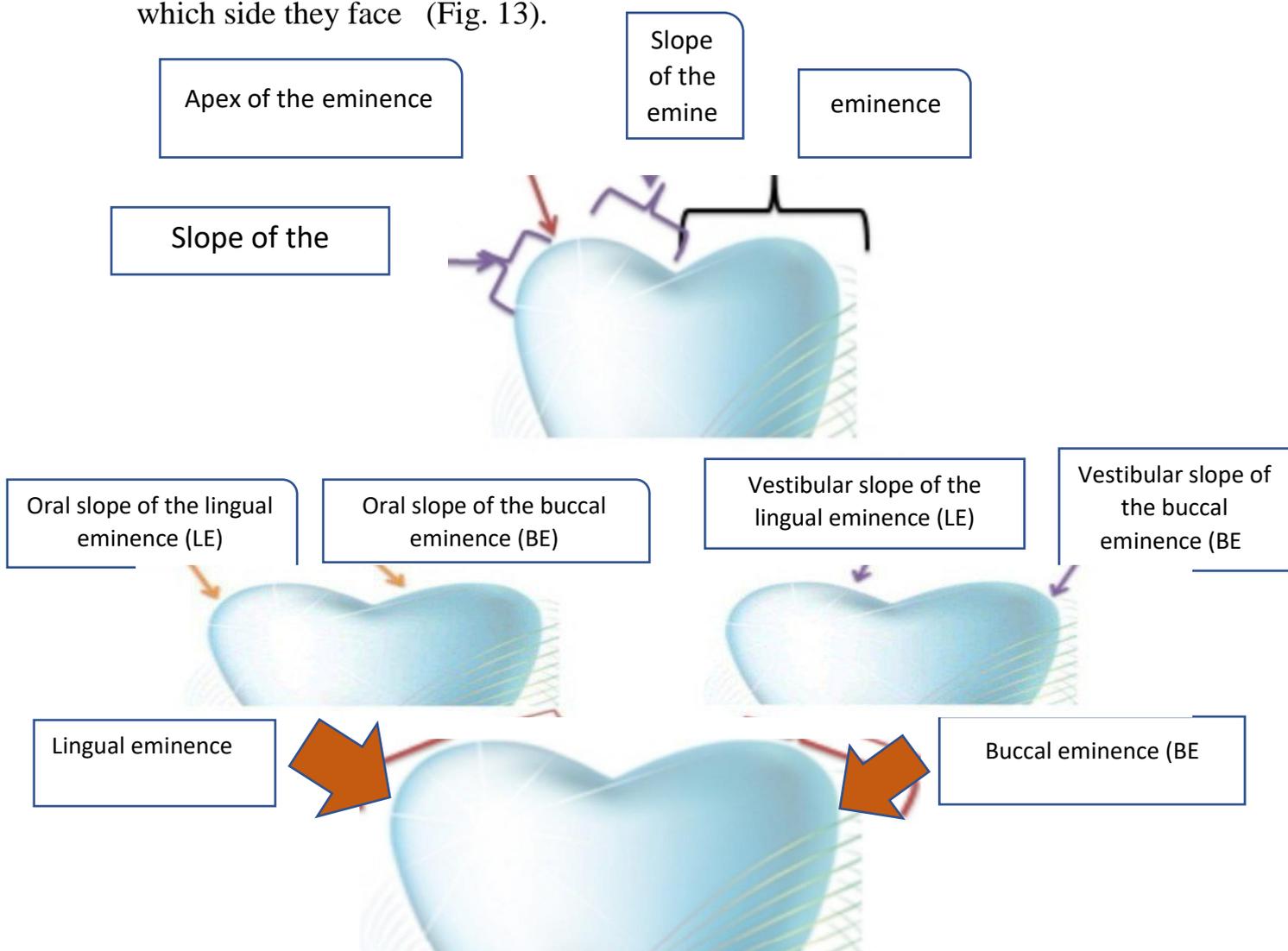
In cases where there are defects in the dentition and the possibility of secondary tooth movement appears, their grinding must be completed with orthopedic measures.

The static phase represents various types of closure (occlusions) of the dentition, i.e. distal, central, anterior and lateral occlusions

The dynamic phase is the movement (excursion) of the lower dentition from the initial central occlusion to various marginal occlusions, i.e. distal, anterior and lateral occlusions and in the opposite direction

Grinding of teeth should be aimed at creating multiple, smooth and simultaneous tooth contact with all functional positions and movements of the lower jaw inherent in this patient.

In addition to the usual examination methods, special techniques are used: analysis of occludograms, diagnostic models of jaws, marking of supracontacts using carbon paper. The slopes of the teeth are named depending on which side they face (Fig. 13).



Thus, the vestibular slopes of the teeth face the cheek, and the oral slopes face the tongue (palate). The division into vestibular and oral slopes is considered in the transverse direction.

The slopes of the hillocks have mesial and distal slopes, which are viewed in the sagittal (anterior–posterior) direction. Thus, the tubercle of the tooth has two slopes – vestibular and oral, and each slope has two slopes – mesial and distal. Various methods of grinding teeth are known, but the most popular methods are Jankelson and Schuyler.

The Jankelson method

Jenkelson suggests eliminating premature dental contacts in central and habitual occlusions and does not attach importance to premature contacts in lateral and anterior occlusions. The author distinguishes 3 classes of premature contacts. The surface of the slopes of the dental tubercles is designated by classes I, II, III, and the antagonizing surfaces of the teeth of the opposite jaw are Ia, IIa, IIIa

The surface of the slopes of dental tubercles	Antagonizing tooth surfaces of the opposite jaw
I – vestibular slopes of the buccal tubercles of the lower molars and premolars and the vestibular surface of the anterior lower teeth	Ia – oral slopes of the buccal tubercles of the upper molars and premolars and the oral surface of the anterior upper teeth
II – oral slopes of palatine tubercles of upper molars and premolars	IIa – vestibular slopes of lingual tubercles of lower molars and premolars
III – vestibular slopes of palatine tubercles of upper molars and premolars	IIIa – oral slopes of buccal tubercles of lower molars and premolars

Grinding according to the Jankelson classification should begin with correction in the position of the posterior occlusion (which eliminates premature contacts on the mesial slopes of the vestibular slopes of the palatine tubercles of the upper molars and premolars, as well as the distal slopes of the oral slopes of the buccal tubercles of the lower premolars and molars), which corresponds to classes III and III Jankelson, because it is in these areas that premature contacts are most often observed. In abbreviated form, this rule in the dental literature is denoted by the Latin letters MODU (mesial, ober, distal, unter), which means mesial, upper, distal, lower.

Premature contacts	Premature contacts
1st and 2nd grade	3rd grade
They lead	
to a displacement of the mandible laterally, and overloaded teeth deviate orally or vestibularly	to a displacement of the mandible medially (forward)
The purpose of selective grinding of premature contacts of grades 1 and 2 is to narrow the chewing surface of the teeth to reduce occlusal load	To prevent sagittal (anterior-posterior plane) displacement of the mandible, selective grinding of the medial slopes of the upper molars and premolars is performed.

It is recommended to carry out selective resurfacing in 4-6 visits with intervals of 7-10 days to adapt the periodontal and neuromuscular systems. 10-15 days after the last visit, if necessary, selective grinding of teeth of all three classes is carried out, and the results are checked. Repeat visits are carried out once every 6 months for examination and possible correction of occlusion.

Premature contacts with central occlusion may they can also be detected on the front teeth. The following test is performed to determine the sanding area.

*If premature contact between **the front teeth persists** when the lower jaw is extended, the lower incisors must be shortened, since their cutting edge sliding along the palatine surface of the upper teeth is the cause of occlusion disorder (Fig. 15a).

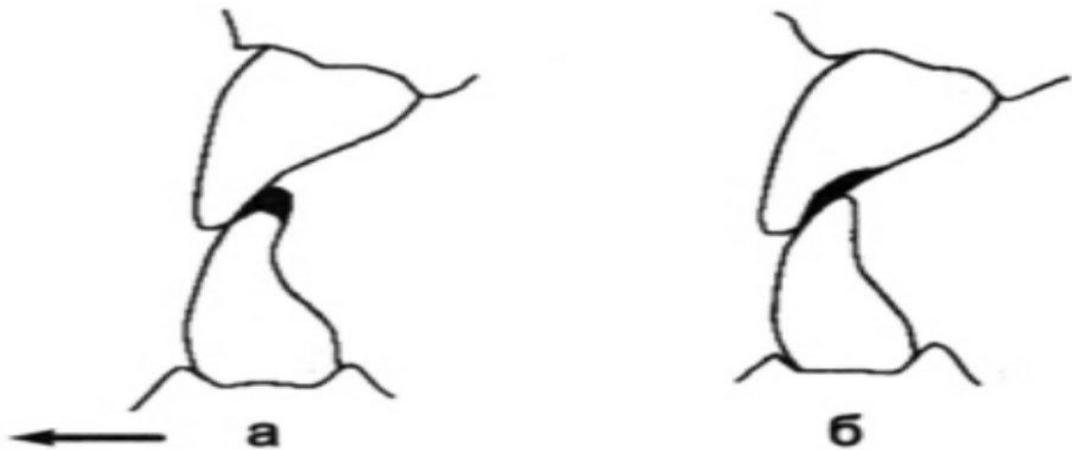


Fig. 2.13. Correction of supracontacts on the front teeth with central occlusion

*If, when moving the lower jaw forward, premature contact between the antagonizing teeth disappears, then this is an indication for **correcting the palatine surface of the upper teeth incisors**. In this case, the reason for the formation of premature contact is the tooth of the upper jaw. Shortening of the lower incisor in this case is unacceptable, as this can again lead to the formation of premature contact as a result of its subsequent secondary movement (Fig. 2.13b).

After grinding, the multiple contact of the front teeth must be restored.

The Schuyler method

According to the Schuller method, correction is performed in both **the central, anterior and lateral occlusions.**

1. Grinding is preceded by the removal of teeth with a high degree of pathological mobility, causing pronounced deformation of the dentition.
2. Then the sanding planning is carried out.
3. To do this, first visually, and then using a strip of softened wax or carbon paper, specify those areas that are subsequently sanded.
4. At first, such manipulation is performed only in the position of the central occlusion, and then in the anterior, lateral and posterior occlusions.

When sanding, only the configuration of the hillock slopes changes, and the hillocks themselves, as a rule, do not grind.

The fact is that the interalveolar height should not be allowed to decrease. The interalveolar height is reliably fixed by the palatine tubercles of the upper teeth and the cheek tubercles of the lower teeth – these tubercles are not sanded!!!

For this, the grinding is carried out according to the formula "**SHCHVYAN**" (BOLU rule: "buccal ober – lingual unter")

This means that they are being **dissected.**:

- cheek (Cheek) tubercles of the upper (B) and
- lingual (I) tubercles of the lower (H) teeth.

Since *these tubercles determine* the direction of the *transversal (lateral) movements of the mandible*, they can be smoothed by grinding.

"**Occlusal facets**" are flattened areas on the convex dental surface formed by erasure.

Erasure facets (French *facette*) – shiny polished areas on the teeth formed at the points of contact of the antagonist teeth

The facet –

- 1) the beveled side face of something,
- 2) the face of a polished stone,
- 3) a small flat surface of a bone or tooth,
- 4) an orthopedic structure that makes up for the absence of a tooth and mimics its structure. It is not attached to the jaw bone by anything, but is held by the fact that it is suspended in a special bridge-like prosthesis to nearby teeth. In fact, the facet is an artificial tooth.

2.4. Diagnostic methods for premature occlusal contacts (supracontacts)

An **occludogram** is a relief impression of the occlusal contacts of the dentition on a wax plate.

Occlusography is a method of obtaining occlusal contacts on thin plates of wax (you can use bag wax) when closing the rows of teeth.

Normally, the occlusogram should have uniform translucent areas of wax throughout the occlusal surface of the teeth.

Normally, **with an orthognathic bite**, a line contact is determined on a strip of wax in the area of the front teeth and a pin contact in the area of the lateral teeth, but the thinnest layer of wax remains in these areas.

To obtain an occludogram on the dentition of the upper or a wax plate or occlusive paper is placed in the lower jaw, the patient closes the dentition rows. If

there are excessive contacts in a particular area, holes form in the wax, and if there are no contacts, there is no imprint in the wax. After applying a wax plate to the diagnostic model, areas of excessive contact on the plaster model of teeth are transferred with a pencil and the grinding zones are determined. In the central occlusion, the teeth are not removed from contact.

To avoid excessive sanding of the tissues, it is advisable to **first sand the teeth on the plaster model**, make up a plan of action in the oral cavity, to decide whether supercontacts can be eliminated by grinding or whether other occlusal correction methods are needed.

The analysis of plaster diagnostic models of jaws is carried out to identify traumatic occlusion and premature contacts. Diagnostic models of the jaws are obtained both before and after systematic grinding. They serve as an objective control for comparing before and after treatment. On models of jaws, the lingual surface of the dentition is freely examined when they close, which is important for clarification existing occlusal disorders, as well as to establish the localization of facets of abrasion of the hard tissues of the teeth, indicating the chronic nature of traumatic contact. On jaw models, a sequence of occlusal alignment measures can be outlined; thus, some significant occlusion disorders should be eliminated not by grinding, but by prosthetic measures. In some cases, jaw models can be analyzed in an average and individual articulator. It is very useful, in order to master the methodology, to carry out teeth grinding on a plaster jaw model. This helps doctors who master the technique to carry out selective grinding in the patient's oral cavity with greater confidence and efficiency.

Articulation (occlusion) paper

One of the most accurate methods of detecting premature contacts is the use of articulation (carbon) paper (Fig. 2.14-15).



Puc. 16



Fig. 14. Articulation (occlusion) paper

Fig. 15. Colored point areas

This method is especially useful in determining premature contacts in the analysis of anterior and transversal occlusion, not only in the static phase, i.e., the closure of the dentition in any occlusion, but also in the dynamic phase, i.e., during the excursion of the lower jaw from the position of the central occlusion to the anterior or transversal (right and left) occlusion (Fig.19).

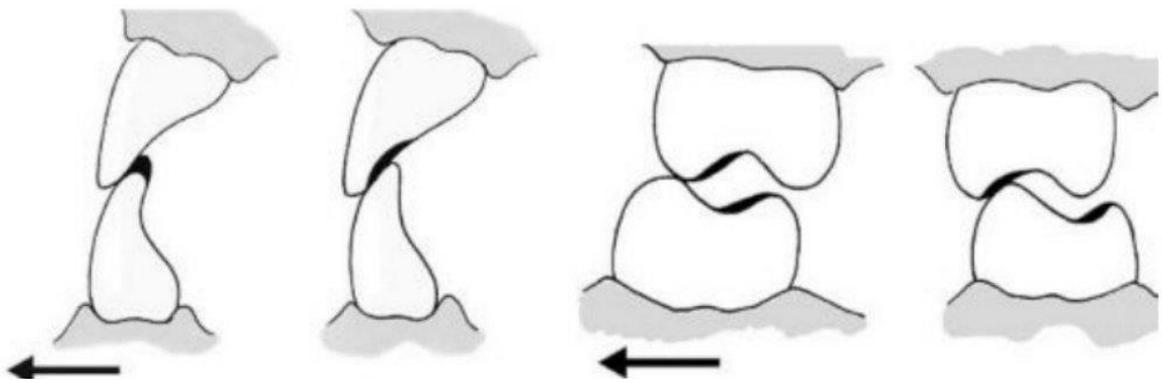


Fig. 2.16. Principles of grinding of anterior and lateral teeth in dynamic occlusion.

The most intensely colored areas or fabrics are sanded in those places where a perforation forms on the wax, depending on what is used as a diagnostic tool. In this case, the anatomical shape of the tooth should not be grossly distorted, but the removal of tissues should be evenly distributed among the antagonists. This is especially true of the cutting edges of the front teeth. Sanding is completed after removing the obstacles to smooth movements of the lower jaw and after achieving multiple dental contacts in the central occlusion position.

Supracontacts (supercontacts, premature contacts)

Centric	Eccentric
<p>They are observed in the position of the jaws in the central occlusion, in the posterior contact position (central ratio) and on the way from the posterior contact position to the position of the central occlusion ("sliding in the center")</p>	<p>In the positions of the anterior and lateral occlusion</p>

Elimination of premature contacts in case of lateral occlusion. First of all, premature contacts on the balancing side (the so-called hyperbalancing contacts) are eliminated which prevent the teeth from closing on the working side. Only then can we proceed to the assessment and correction of dental closure on the working side.



Fig. 2.17. Hyperbalancing contact

When grinding on the working side (the side of the displacement of the lower jaw), a group contact of at least the buccal tubercles of the upper and lower premolars or molars should be achieved, in the anterior occlusion – the maximum possible number of front teeth (incisors and canines), in the central occlusion – multiple fissure-tubercle contact of the teeth of both sides.

During sliding movements from the central occlusion to the posterior contact position, those slopes of the tubercles that prevent uniform sagittal movements of the lower jaw should be sanded.

Grinding is *carried out to remove the concentration of occlusal contacts on individual teeth*, and not to turn them off from occlusion. After visual inspection of these areas, they are ground during jaw movements. If the paper leaves a uniform mark on all contacting surfaces, and visual inspection confirms the absence of blocking areas, sanding is stopped. All the sanded areas are smoothed with a rubber polish.

The final stage is the treatment of the prepared surfaces of the hard tissues of the teeth:

- 1) They are polished;
 - 2) calcium ions are impregnated in them by electrophoresis;
 - 3) they are coated with fluorolake or a protective coating varnish,
- in their absence, bonding from a photopolymer can be used.

Selective grinding of teeth is performed during 3-4 visits with an interval of 7 days.

Patients with malocclusion have atypical contacts in the central, anterior and lateral occlusions, therefore, the areas of the occlusal surface of the teeth to be sanded are determined individually for each patient (habitual occlusion).

Habitual occlusion is forced occlusion with maximum possible contact of existing teeth. It is characterized by a violation of the topography of the elements of the TMJ (displacement of the articular heads and/or discs). There may be symptoms of musculoskeletal dysfunction.

Habitual occlusion is the final physiological closure of the teeth of the upper and lower jaws.

Statistical occlusion is the contact of the jaws in one specific position.

Dynamic occlusion – jaw contact during sliding movements.

Dysocclusion is the absence of contact between antagonistic teeth.

Functional occlusion – dynamic contacts of the dentition

rows in the central, lateral and anterior occlusions – the result of in the coordinated function of all links of the maxillary system (chewing apparatus).

Central occlusion is multiple fissure–tubercle contacts of the dentition rows in the central position of the heads of the temporomandibular joint in the articular pits.

Habitual occlusion is the final physiological closure of the teeth of the upper and lower jaws.

The central ratio is the ratio of the lower jaw, in which the condyles occupy an anteroposterior position and contact the central part of the articular disc located opposite the articular tubercle.

The central ratio of the jaws is the relative position of the jaws in three mutually perpendicular planes.

Centric occlusion is a term combining central occlusion, sliding along the center and the posterior contact position of the teeth in the central ratio of the jaws.

Eccentric occlusion – occlusal contacts of teeth in the frontal and lateral occlusions during chewing movements of the lower jaw.

In case of periodontitis, due to the significant mobility of the teeth, obtaining occlusograms and even more so their interpretation are difficult, therefore V.N. Kopeikin proposed to carry out selective grinding of teeth in 2 stages.

At the first stage, it is necessary to carry out preliminary grinding of teeth in the area of *pronounced supercontacts*

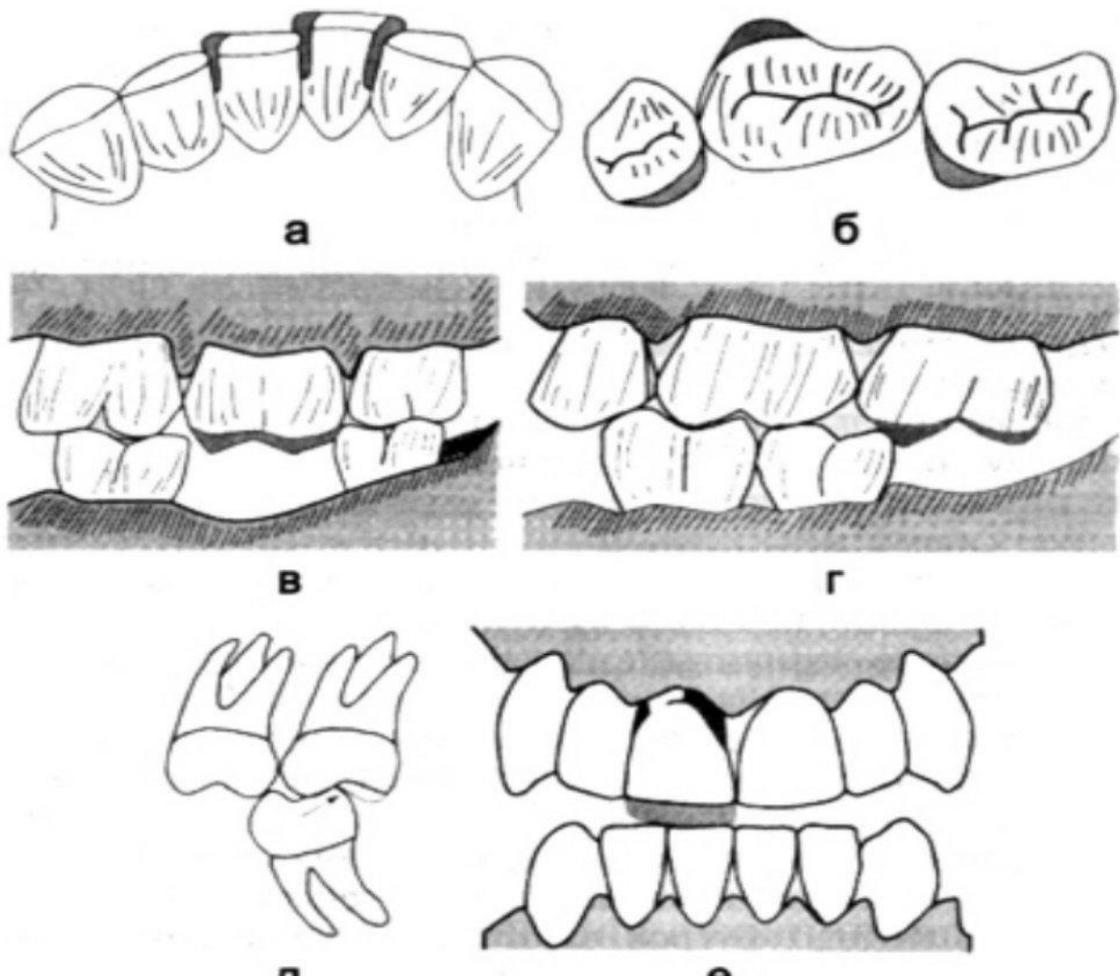


Fig. 2.18. Pre-grinding phase, elimination of coarse occlusal disharmony (Zhulev E.H., 2003):

a - minor correction by grinding the contact (approximate) surfaces of the lower front teeth, which can help eliminate their crowding;

b – incorrect position of the lateral teeth leads to the formation of retention points;

c – before replacing the dentition defect, the elongated molar of the upper jaw must be sanded to the level of the occlusal surface;

l is an elongated tooth at the end of the dentition that does not have an antagonist.,

it must be sanded, as it prevents articulation;

e – shortening of the distal tubercle of the upper molar

allows the lower tooth to align.;

e – shortening of individual displaced teeth

The second stage is carried out *after immobilization* of teeth with various splinting therapeutic structures.

The described method of selective grinding in It is more fully indicated for patients with orthognathic and other forms of physiological bites that are close to it.

However, with other types of bites (deep, progenia, prognathia, macro- and micrognathia, deep incisor overlap), selective grinding is recommended in the central, anterior and posterior occlusion, since lateral occlusion is practically absent. With crossbite, narrowing of the dentition, and the reverse relationship of the lateral teeth in the transversal plane, the central and lateral occlusions are the preferred positions for registration and elimination of supracontacts.

2.5. ERRORS, COMPLICATIONS DURING SELECTIVE POLISHING AND THEIR PREVENTION.

If the rules and recommendations for selective grinding of teeth are not followed, the following undesirable consequences and complications are possible:

- * decrease in interalveolar height;
- * displacement of teeth;
- * hyperesthesia of hard tissues;
- * excessive stress on the periodontium after flattening of the tubercles
- * removal of some teeth from occlusal contact and periodontal overload of others.

The mistakes made by doctors when carrying out the technique of selective grinding of teeth can be divided into two groups:

- 1) errors related to incorrect determination of indications, as well as the time of the technique in a complex of therapeutic, surgical and orthopedic measures for periodontal diseases and parafunctions of the masticatory muscles;
- 2) errors related to violations of the scope and sequence of the stages of the methodology.

If the selective grinding of teeth is performed incorrectly, complications may appear after a short period of time.

It is unreasonable *to simply shorten the dental tubercles in healthy patients over the age of 25* with pronounced dental lumps in order to prevent traumatic occlusion or artificially stimulate the processes of physiological erasure of hard dental tissues.

With the development *of periodontal diseases and bruxism in the absence* of clinically and radiologically confirmed symptoms of traumatic occlusion, i.e. when the condition of occlusion stabilized, selective sanding should also not be carried out.

Carrying out selective grinding of teeth *in patients with inflammatory process phenomena in periodontal tissues without prior therapeutic treatment is a medical error*. In the period of acute inflammation, when the patient experiences severe pain in the gums and reflexively spares the affected area of the dentition when closing, obtaining multiple contacts in various positions of the lower jaw, and especially in the central occlusion, presents significant difficulties for the doctor.

Therefore, sanding is performed incorrectly, blindly: the hard tissues of the teeth are ground in vain in areas that do not correspond to true premature contacts, and since after the acute inflammation of the marginal periodontal has subsided, the teeth change their position and other areas of the occlusal surface of the teeth come into contact with the antagonist teeth, sanding has to be repeated.

It is unacceptable to postpone selective polishing until the surgical treatment of periodontal diseases is completed, because this does not eliminate one of the main

causes of the development of intraosseous pockets, namely premature occlusal tooth contacts, and surgical treatment does not lead to the desired result.

Carrying out selective grinding without first eliminating secondary deformations of the dentition and dental anomalies by surgical, orthodontic or prosthetic measures is also a medical error.

Directly in the process of selective tooth grinding, medical errors are often made due to the incorrect choice of the individual volume of intervention and the violation of the sequence of stages of the technique.

The incomplete, as well as unreasonably expanded scope of the technique chosen by the doctor without taking into account the individual characteristics of the type of chewing, the type of bite of the patient and the clinical picture of the disease, leads to the preservation of individual premature dental contacts in the patient's inherent phases of occlusion – the static phase.

Articulation is a dynamic phase. As a result, new traumatic occlusive situations may not only persist, but also arise, which contribute to the development or aggravation of periodontal diseases and parafunction of the masticatory muscles.

Violation of the sequence of stages of selective grinding of teeth makes it difficult to carry out systematic manipulations and leads to the exclusion of individual stages, which significantly reduces the effectiveness of the treatment method.

Some doctors, forgetting about the important functional significance *distal (retroactive) occlusion, mistakenly identified with central occlusion*. However, there is a distance between the central and distal occlusions, which in some cases reaches 1 mm. This should be remembered both in the manufacture of dentures, especially full plate ones, and in the selective grinding of teeth. Ignorance or non-observance of this provision leads to various errors. During prosthetics, patients cannot get used to prosthetics, because the normal, normal for this articulatory

movements of the lower jaw in the patient. When grinding teeth, the patient may experience periodontal overload and parafunction of the masticatory muscles.

Empirical unsystematic grinding of teeth based solely on visual detection of premature tooth contacts is completely unacceptable. As a result, the doctor may be some areas of the occlusal surface of the teeth are excessively sanded and others are under-sanded. It is important to take into account that excessive grinding of the dental tubercles leads to a decrease in the height of the bite, flattening and expansion of the chewing surface of the teeth. There is a so-called lowered sliding bite. In addition, there is often an increased sensitivity of the hard tissues of the teeth to temperature, chemical and mechanical stimuli.

With insufficient grinding, many premature contacts will remain unresolved, and periodontal tissue injury will progress.

The listed medical errors should be taken into account in clinical work when mastering the technique and, if they did exist, eliminated in a timely manner. Otherwise, serious complications develop that are difficult to treat. These include dental hard tissue hyperesthesia and iatrogenic conditions.

With the development of hyperesthesia, special attention should be paid to the subsequent fluoridation of the polished surfaces of the hard tissues of the teeth, which relieves or significantly reduces pain.

Of particular difficulty is the elimination of iatrogenic conditions that have arisen as a result of the haphazard implementation of the selective tooth grinding technique, its incompleteness for some reason and irrational grinding with the creation of a flat, sliding occlusion. In such cases, patients indicate significant inconveniences associated, firstly, with the feeling of "interfering" with some tooth when closing the dentition, and secondly, with the inability to fully chew food due to the "blunting" of teeth, the lack of stable, stable interaction of teeth., when the rows of teeth seem to "wander" in all directions.

In the first case, despite the negative attitude of the patient towards selective polishing, it is necessary to consistently monitor all stages of the technique and persistently bring them to the end. To carry it out in less traumatic conditions, local anesthesia of various types, connection of water cooling during grinding, etc. can be used.

In the second case, while maintaining the height of the central occlusion, it is possible to carry out a complex reconstruction of the occlusal surface using selective tooth grinding techniques. When improper grinding of teeth leads to a decrease in the height of the bite, it is necessary to resort to prosthetic measures: the manufacture of crowns, which restore the height of the bite and multiple occlusal contact in all individual, functional positions of the lower jaw.

2.6. T-scan — a digital diagnostic system occlusions.

During the examination, the patient bites the sensor plate, which captures areas of excessive or insufficient load on the teeth. The results are displayed graphically on a computer monitor and can be clearly demonstrated to the patient. The "T-scan" technology allows the analysis of tooth closure according to various parameters: the percentage of load distribution on each tooth, the exact localization of supercontact on the tooth surface, jaw closure in dynamics from the first contact to the last, the change of occlusion in dynamics. The technology is used in periodontics to detect dental supercontacts, orthopedic dentistry, and orthodontics. Consultations with related specialists (cardiologist, endocrinologist, gynecologist). The nature of the course of periodontal diseases is significantly influenced by concomitant diseases of the patient, as well as long-term use of certain medications. Consultations of related specialists and interaction with them (endocrinologist, cardiologist, gynecologist, gastroenterologist, etc.) are necessary to increase the effectiveness of dental treatment.



Fig.12. Digital occlusion diagnosis “T-Scan”

TOPIC 3. TACTICS OF THE GENERAL DENTAL PRACTITIONER IN PLANNING AND CARRYING OUT TREATMENT. PROSTHODONTIC METHODS OF TREATING PERIODONTAL DISEASES: INDICATIONS, CHOICE OF CONSTRUCTION, PRINCIPLES OF TOOTH STABILIZATION AND PREVENTION OF COMPLICATIONS.

Dental splinting is a complex of measures aimed at connecting pathologically mobile teeth into a single block, thereby redistributing chewing pressure over a large area.

The biomechanical foundations of splinting give an idea of the influence of various elements of splinting devices on the structural and functional relationships of teeth and surrounding tissues, including their effect on spatial displacement of teeth and blood circulation in periodontal tissues, the nature of tissue deformation of this complex, as well as the functional significance of various types of splints in the normalization of blood circulation, tissue trophism, and metabolic processes.

The stiffness of the tire. Limitation of dental mobility due to the stiffness of the splint, which has a beneficial effect on periodontal disease, teeth can to make movements only together with the tire and in the same direction with it, and the amplitude of vibrations of the tire is much less than that of individual teeth.

Redistributing the load based on the number of teeth. Periodontal relief by normalizing the distribution of masticatory pressure. This effect increases with an increase in the number of splinted teeth. The load in the splinted block is primarily perceived by the least mobile teeth, thereby unloading the teeth from the greatest damage to his supporting apparatus.

The number of teeth and the redistribution of the load. The splinting structure, located in an arc, is the most rigid due to the arched shape and the mutual intersection of the mobility vectors of the teeth included in the splint.

Arc and transverse immobilization. With the linear arrangement of the splints in the lateral sections, they must be connected transversely using an arc

prosthesis to reduce harmful transversal effects. The best result in splinting is achieved if the splint unites teeth whose lines of mobility lie in intersecting planes.

3.1. Requirements for tires

1. Create a solid block of a group of teeth, limiting their movements in three directions: vertical, vestibulooral and mesiodistal.
2. Be rigid and firmly fixed on the teeth.
3. Do not create blocking moments for the movement of the lower jaw with your occlusal surface.
4. Do not have retention points for delaying food and plaque.
5. Do not interfere with professional and individual oral hygiene.
6. Do not irritate the marginal periodontal area.
7. Do not interfere with medical and surgical effects on the periodontal pocket.
8. Do not disrupt the patient's speech.
9. Do not cause gross violations of the patient's appearance.
10. The creation of a splint should not be associated with the removal of a large layer of hard tissues of the dental crowns.

Types of tires

By duration: temporary permanent	According to the method of fixation: removable , non-removable
By material: metal plastic composite combined	According to the manufacturing method: laboratory clinical
According to the manufacturing method: cast stamped soldered by polymerization, standard ligature	By design: inlays, bridge -like prostheses, shoulder plate prostheses

Temporary tires are used for a certain period of time, for example, for the period of manufacture of permanent tires or conservative therapy.

Permanent splints can be conveniently divided into splints for front teeth and for side teeth. They are used as therapeutic devices to immobilize teeth for a long time.

Prior to the manufacture of splints, it is necessary to normalize the occlusal contacts of the remaining teeth of the upper and lower jaw by selective grinding.

Combining teeth with different periodontal conditions with various denture designs, the reserve forces of many teeth or even the entire dentition. The presence of reserve forces, their absence, or the development of functional insufficiency underlie the choice of splint devices and prostheses.

Splints for front teeth

The tires on the tabs are a group of tabs combined into a solid structure located on a specially designed on a prepared bed. The inlay bed can be located on the cutting, oral and approximal surfaces of the dental crowns.

The tabs can also be fixed by parapulpal and the root pins (fig. 30).

The beam splints for the front teeth are a block natural teeth immobilized by a beam located on the oral surface of the teeth. Positive properties of these structures: good immobilization of teeth and compliance with aesthetic requirements; negative: mechanical treatment of hard dental tissues



Fig. 3.1. Beam tire with pins

The annular splint is a system of soldered rings and covers the teeth from the vestibular side to the equator, and from the oral side it goes beyond the dental tubercle, the cutting edge of the teeth remains free



Fig. 3.2. The ring tire

The cap splint is a system of soldered caps covering the cutting edge, the contact surfaces of the teeth, reaching the equator from the oral surface



Fig. 3.3. Cap tire

Half-crown tires look like a block of half-crowns soldered together, providing reliable immobilization. Disadvantages: they are difficult to manufacture and have little aesthetics.



Fig. 3.4. Splinting with cast half-horns

Splints mounted on root pins are used for splinting movable depulped teeth. The tires provide good immobilization and are aesthetically pleasing. The disadvantages include depulping of teeth. These include Mamlok, Bruna, and other tires.



Fig. 3.5. Beam tire with pins

Splints made of full crowns for front teeth are widely used to immobilize movable teeth. These splints have good splinting properties and effectively limit the pathological mobility of teeth. In case of periodontal diseases, complete crowns are made with supragingival preparation to avoid injury to the gums. To achieve an aesthetic effect, these splints are made in combination (metal ceramics, metal plastic).

Dental immobilization, in which the splints are positioned antero-posteriorly on the lateral teeth, is called lateral, or sagittal. The sagittal type of stabilization allows you to create a block of teeth that is resistant to forces developing in the vertical, transversal and medial directions.

Splints for side teeth

Splints on the side teeth tabs cover part of the chewing surface and restrict their movement in the vertical direction. To make the splint more durable, sometimes the connection to the teeth is made by pins.

Half-crowns, crowns, and root pins can be included in the beam splints for lateral teeth, between which the beam is located

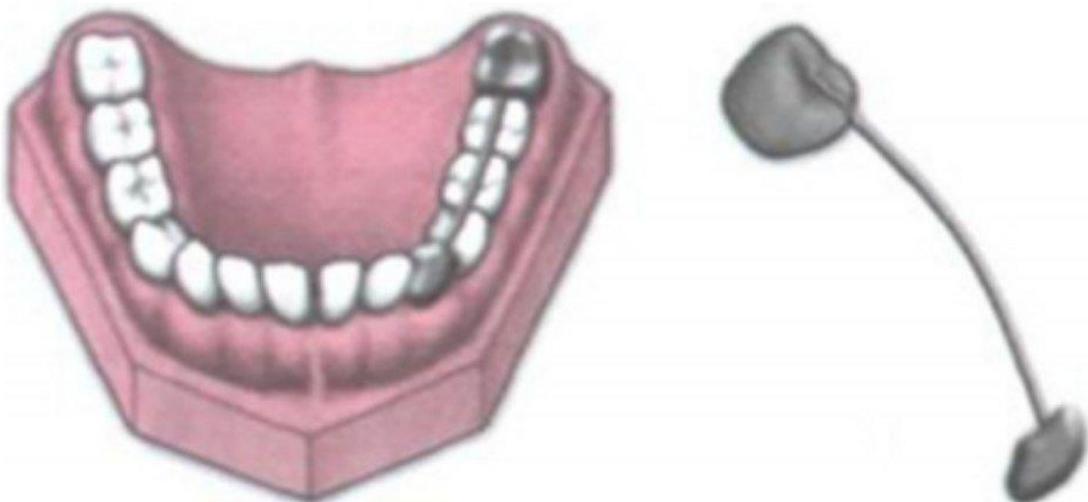


Fig. 3.6. Girder rail

Cap, half-crown, and splints with equator crowns for lateral teeth are used to immobilize movable teeth in periodontal diseases. They have fairly good splinting properties, do not adhere to the marginal gum and do not aggravate its condition, but are unaesthetic.

Splints made of complete crowns for lateral teeth are widely used to immobilize movable teeth (fig. 3.7-3.8).

(Fig.3.7.)

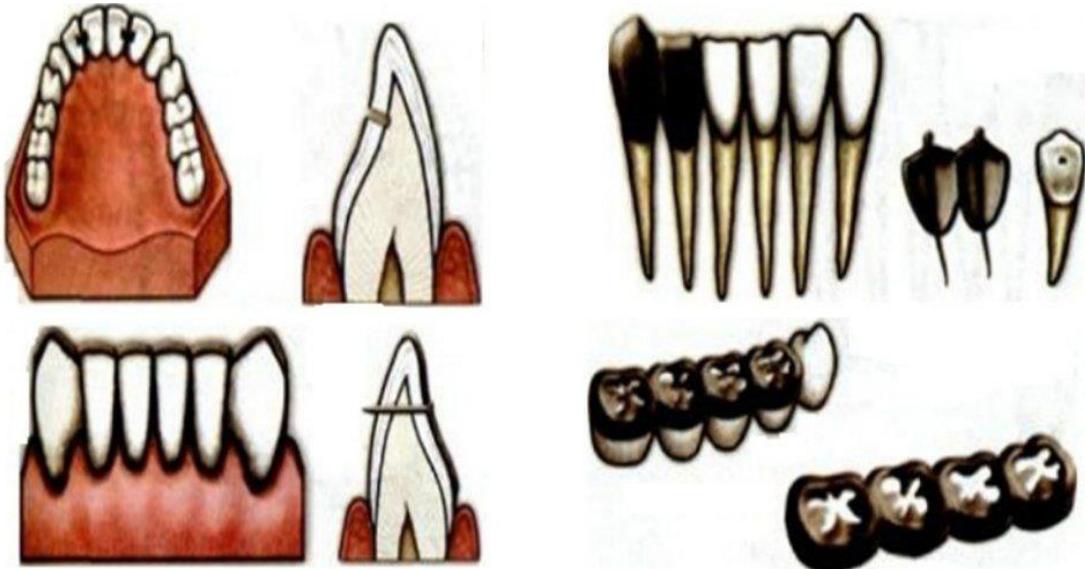


Fig.3.8.

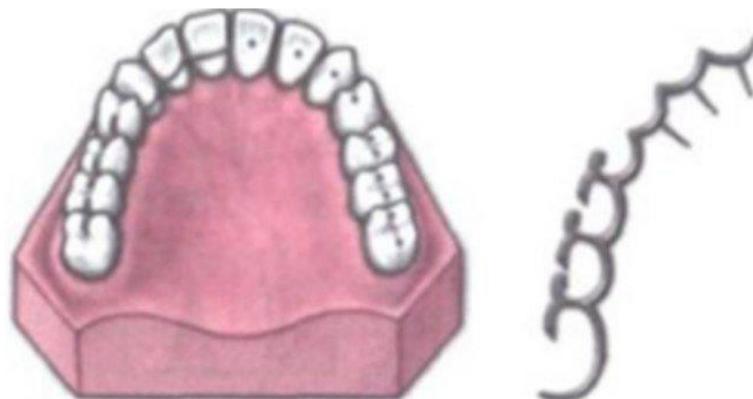


Fig. 3.9. Multi-link busbar on a pin base



According to the manufacturing technology, tires made of full crowns can be stamped, cast, or combined. Such a design, having good splinting properties, can be unaesthetic, and adjacent to the marginal gum, it can aggravate its condition: irritate, injure and hinder the implementation of preventive measures. Therefore, when using full crowns, it is necessary to carry out supragingival dissection. Complete artificial crowns should be used in cases where the ratio of the extra- and intraalveolar parts of the lateral teeth is not disturbed. For to achieve an aesthetic result, preference should be given to metalacrylic and metal-ceramic crowns.

3.2. Types of stabilization and their justification

The topography and magnitude of the dentition defect, along with the periodontal condition of the teeth bordering the defect and all remaining teeth, determine the nature of stabilization and the type of splint.

Depending on the location of the tire, the following types of stabilization are distinguished: frontal, sagittal, frontosagittal, parasagittal, and arc stabilization.

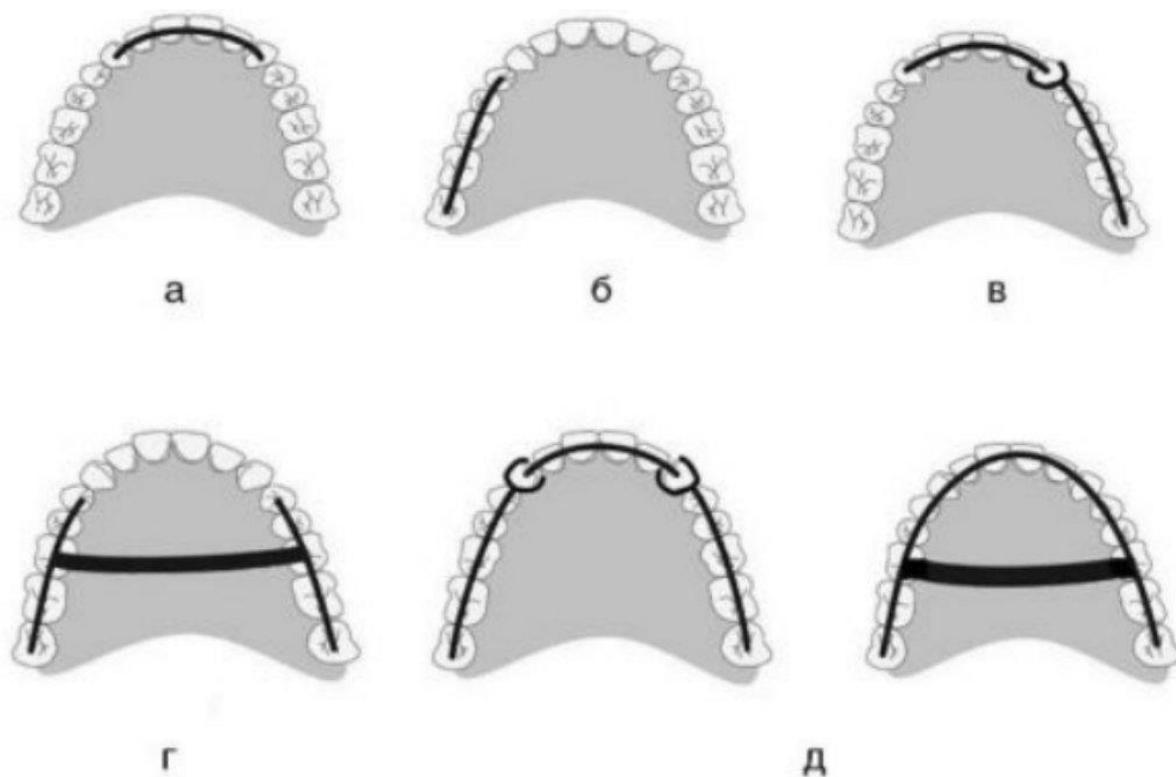


Fig. 3.10. Types of dentition stabilization:
a – frontal; б – sagittal; в – frontosagittal;
г – parasagittal; д – arc stabilization

The type of dental row stabilization, i.e. the length of the splint, is determined based on the clinical situation and the analysis of the periodontal chart. The length and type of splint depend on the degree of preservation of the reserve forces of teeth affected by periodontitis and the functional ratios of the antagonizing pairs of teeth. In this case, the following rules should be followed: the sum of the coefficients of the functional significance of teeth (according to the periodontogram) with intact periodontitis included in the splint should be 1.5-2 times higher than the sum of the coefficients of teeth with affected periodontitis and equal to 1/2 of the sum of the coefficients of antagonist teeth involved in biting and chewing food. In this case, a

single system of equator crowns, crowns with lining (metal-ceramic or metal-composite), adhesive tires, solid-cast removable tires, etc. can be used as a tire.

If focal (localized) periodontitis spreads to the entire functionally oriented group of teeth (anterior, lateral) and these teeth do not have reserve forces (atrophy has reached 1/2 the length of the well wall or more), it is necessary to switch to a **mixed type of stabilization**.

For the group of chewing teeth, the **parasagittal** type of stabilization is most appropriate. In a dental arch with defects in the lateral sections, its sagittal stabilization can be enhanced by transverse stabilization, which is called *parasagittal* stabilization. Typically, such stabilization is achieved by an arc prosthesis, i.e. a combination of non-removable devices with a removable splint with a prosthetic leg. With such a splinting system, the lateral load that occurs on one side is distributed to the opposite side. Indications for the use of parasagittal stabilization and removable splints are cases of periodontal damage to distally located teeth both with intact dentition and with defects in them (Fig. 31g).

For a group of front teeth, **frontal** or arch stabilization is used (Fig. 31a, 31d). If the front section is connected to the lateral stabilization such stabilization is called **frontosagittal** (Fig. 31b).

With intact dentition and grade II and III focal periodontitis in the group of anterior teeth of the upper jaw, the use of endo-54 is an effective way to reduce tooth mobility endodonto-endossal implants inserted into the bone tissue of the periapical zone through the tooth canal. This type of splinting makes it possible to strengthen teeth with mobility of II–III degrees.

3.3. Temporary splinting at the stages of periodontal disease treatment.

Types of temporary buses

The method of temporary splinting is used for generalized or focal chronic periodontitis during the period of exacerbation and throughout the entire period of complex treatment until the application of a permanent splinting device.

Temporary splinting allows you to eliminate traumatic the effect of pathological mobility and chewing function is one of the pathogenetic signs supporting hemodynamic disorders in periodontitis.

The splint ensures an even distribution of masticatory pressure forces between the periodontal teeth included in the splint, creates rest for the affected tissues and helps to increase the effectiveness of pathogenetically based and symptomatic therapy.

The use of a temporary splint allows you to break the pathogenetic chain: inflammation→ impaired blood supply→ dystrophy the function of chewing; helps to improve the trophism of periodontal tissues, eliminate the inflammatory process.

In addition, surgical treatment of moderate to severe periodontitis (gingivotomy and gingivectomy, for example) is not recommended without prior dental immobilization. In generalized periodontitis, all teeth are inserted into the splint, providing arch immobilization.

In focal periodontitis, the length of the splint is due to the location of the lesion and its relationship to the teeth in which the periodontal is not affected: the splint must be included in the block teeth with unaffected periodontal disease. Temporary tires are made of plastic. There are mouth guards, oral and vestibulo-oral multi-link splints.

Mouth guard splints cover the occlusal part of the dental crowns, their use is associated with an overestimation of the occlusal height.

Plastic splints, reinforced with metal or non-metallic fittings and temporarily fixed, provide the best splinting effect, at the same time allow you to repair dental defects and improve the appearance of the patient.

Temporary tires must meet the following requirements:

- a) securely fix all teeth;
- b) easy to apply and remove from the dentition;
- c) evenly redistribute the chewing pressure on the supporting teeth and replace the defect of the dentition;
- d) not to interfere with drug therapy and surgical treatment;
- e) do not injure the mucous membrane of the gum;
- f) be easy to manufacture and affordable.

Dental preparation is allowed in the manufacture of temporary splints.

Temporary tires can be:

- * made of fast-curing acrylic plastics in laboratories,
- * made of composites or light-curing composite materials,
- * bent,
- * cast,
- * stamped mouthguards with occlusal windows
- * multi-link tires made using ligature tires

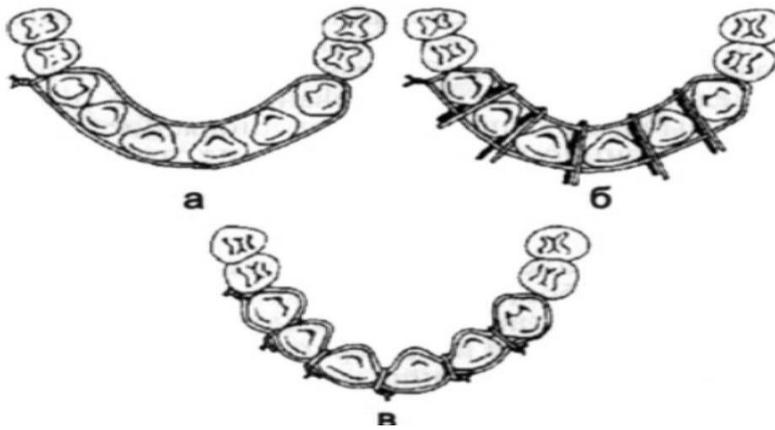


Fig. 3.11. Ligature binding of teeth for the purpose of temporary splinting (Sugar L. et al., 1980):

a – wire loop on teeth;

b – interdental fixation of the loop;

c – wire fixation

Temporary splints are medical splinting devices that are used throughout the entire period of complex periodontitis treatment



Fig. 3.12. The edges of the splint mouth guard do not reach the neck of the teeth,

so that there is no injury to the inflamed periodontal tissues.

Temporary splinting medical devices are being replaced by permanent splinting devices or other denture designs.

The indication for the manufacture of temporary splinting devices is the developed stage of the inflammatory-dystrophic form of focal and generalized periodontitis, especially with tooth mobility and uneven course of the pathological process.

Temporary splints allow you to:

* remove excessive chewing load from periodontal tissues in the complex treatment of periodontitis, it is rational to redistribute the chewing pressure on the supporting teeth and (or) the mucous membrane of the prosthetic bed, to correctly resolve the issue of preserving or removing teeth of II and III degrees of mobility, since inflammation in periodontal tissues enhances tooth mobility even after cupping (that is, after temporary splints can be used for medical and surgical treatment) of inflammatory processes, some teeth may stabilize (grade II mobility may go to the I degree, for example, III to II). In addition, the complex treatment of periodontitis with the use of temporary splints allows you to switch to the optimal type of permanent splints.

Temporary splints can be made of a reinforced composite of acrylic plastics, manufactured in the laboratory or directly in the oral cavity.

The emergence of composites and the widespread introduction of adhesive technologies into dental practice have led to the creation of new materials that are used in periodontology for the manufacture of splints structures, including temporary ones. Dental splints are used as the method of choice, which do not require significant preparation of the hard tissues of the teeth, the so-called *adhesive reinforced splints*. In most cases, they have a small volume, are firmly fixed on the teeth, are aesthetically pleasing, easily polished, provide reliable immobilization of

movable teeth, are easily removable and, in the presence of a defect in the dentition, are able to carry the loads of an artificial tooth.

A well-known method of composite splinting *with aramid thread binding teeth is a Ryakhovsky cable-stayed system* with single-row or double-row circular weaving.



Fig. 3.13. Aramid fiber

Cable-stayed splint teeth

This method is similar to splinting teeth with fiberglass. Only the tire material differs. For the cable-stayed method, a braided ribbon made of aramid fiber is used.

The installation of an aramid splint is carried out in the same way as splinting teeth with fiberglass thread: sawing out a horizontal furrow, placing the thread, sealing.

As a result of the dental work done, the patient's teeth color is normalized, the dentition is restored, the pressure during chewing is distributed equally, and the interdental gaps are closed.

Splinting using fiberglass (fig. 3.14)



Puc. 36

Advantages of cable-stayed splints

- compatible with enamel;
- does not react chemically with food, saliva;
- Aramid is a strong, durable material;
- does not interfere with the usual hygiene procedures in the oral cavity;
- sometimes – an alternative to prosthetics

The chemical composition of tire reinforcement materials can be divided into two groups.

1. Based on an organic matrix – polyethylene. This group includes "Ribbon" (Ribbon) and "Connect" (Kerr)



(Fig.3.15)

Puc. 37

2. Based on an inorganic matrix – fiberglass. Examples of materials in this group are "Glas-Span" (GlasSpan) and "FiberSplint" (Polidenta)

(Fig.3.16)



Puc. 38

The technology of manufacturing a ribbond tire (fig.39)

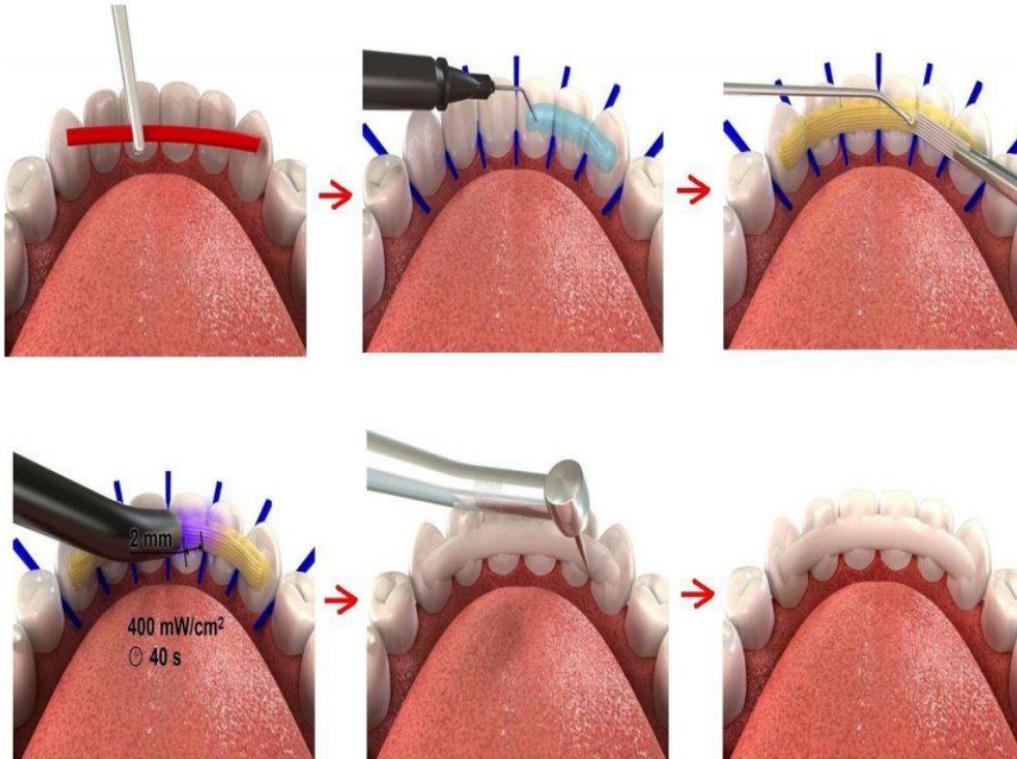


Fig. 3.17. Splinting using fiberglass (see the description of the picture below)

Indirect manufacturing method

1. Movable teeth must be grouped by means of a composite material that is placed in the interdental spaces.
2. Alginate impression material is used to produce an impression, which is used to prepare a plaster model.
3. A template for the future tire is made from the foil that is included in the material kit. The size of such a template is as follows: the length of the foil strip should not reach the contact surface of the outermost teeth to be splinted, the width of the strip should be to cover the surface of the teeth as much as possible from the level of the neck to the border of occlusal contact with the teeth antagonists from the lingual (palatal) surface.

4. Out of the package with great care (without touching to remove the Ribbon with your hands or gloves to avoid moisture, talcum powder and grease), remove the Ribbon with two tweezers and cut off a piece from it with special scissors corresponding to the prepared template. Fabric gloves are used, which are included in the kit.
5. The cut-off piece of Ribbon is moistened with an adhesive (for example, an optical bond from Kerr, USA), the excess of which can be removed by blotting with a fiber-free material. After such processing of the Ribbon, you can simulate it with your fingers.
6. The working model is lubricated with a contrast red release varnish, and then the required amount of composite material is applied from a syringe container to the projection of the tire base, into which a Ribbon strip is inserted (it should be borne in mind that the curing of the composite material of transparent and light shades is much faster).
7. Using a modeling tool, excess composite material is removed, and the tire is cured with halogen light.
8. The resulting tire is rough, so it is again covered with a layer of composite material and polished. 9. After polishing, the tire is placed in a plastic bag and dipped in boiling water for 10-15 minutes for additional polymerization.
10. Then the inner surface of the tire is sandblasted, etched with 9% hydrofluoric acid for 3-5 minutes, thoroughly rinsed with water and dried with a jet of air.
11. The surface of the teeth in the area of the splint is treated with an intraoral sandblaster or prepared with coarse-grained diamond boron, etched with acid, washed, dried and applied a primer layer from an adhesive kit.
12. The splint is fixed on the teeth with a light-curing double-curing composite material.

With the **direct method**, there is no need to obtain an impression and a plaster model. Therefore, the preparation of the lingual (palatal) surface splinted teeth (as with the indirect method) consist in:

- mechanical removal of plaque and processing with a coarse–grained diamond head;
- obtaining a future tire template from foil, according to the dimensions of which a strip of the required size is cut off from the Ribbon and impregnated with an adhesive (adhesive) compound from the kit;
- etching the surface of the teeth with acid, which, after rinsing with water, is dried by a jet of air and covered with a primer layer from an adhesive kit.

After that, the Ribbon strip is pressed against the lingual (palatal) surfaces of splinted teeth. In this case, the movements of the modeling tool are directed from the center of the tire to its edges.

The material in the interdental spaces is especially carefully smoothed. A compomer is applied to the surface of the tire with a brush, after which it is light-cured. The final stage is the mechanical treatment of the tire in the oral cavity.

The advantages of the indirect method of adhesive splint technology should be noted:

- ease and good access to the surface of the teeth on the working model of the jaw;
- the possibility of more thorough and accurate measurement of all operations, including polymerization and polishing;
- reduction of the dentist's working time due to the receipt of a splint by his assistant or a dental technician in the laboratory.

To correct articulatory interference, conventional tools for working with composite materials are used.

Splinting using fiber glass fiber and Fiber Splint ML

Fiber Splint is a 50 cm long ribbon consisting of ultra-thin, specially treated fiberglass. Fiber Splint ML is 6 layers of Fiber Splint superimposed on each other and stitched with glass thread.

The method of using Fiber Splints does not differ significantly from the above, except that the splint is applied layer by layer in order to achieve the thickness and strength of the splint structure required for each specific case.

During the splints performed, a number of conclusions were drawn that can be recommended to all doctors:

*splinting movable teeth with grade I mobility does not require the creation of a special groove (puncture), and with grade II–III it does.

*Periodontal splinting is not recommended patients with a low level of compliance with personal hygiene rules. Observations show that when a patient has high hygiene index values, the probability of a short-lived splint increases significantly, as the design will already be an additional retention factor for dental plaque;

*it is important to check that the splint leaves the interdental spaces open so that the patient can maintain proper oral hygiene. A special point in the subsequent hygienic care of the tire is the use of superfloss or brushes.

3.4. Permanent splinting: removable and non-removable tires.

Indications for the inclusion of teeth in a splint

Permanent splints are used as therapeutic devices for immobilizing teeth for a long time. The patient uses such tires all the time.

Only after the inflammatory processes in the periodontal tissues have been resolved can it be definitively decided whether the teeth should be removed or included in a permanent splint.

As noted above, in order to stop (eliminate) inflammation, complex treatment (including medication and surgery) is necessary, which is performed during the immobilization (immobilization) of teeth using temporary splints.

Indications for the inclusion of teeth in a splint

Indications for the inclusion of teeth in a splint depend on the size of the atrophy of the dental alveoli and the form of periodontal disease.

They are not subject to splinting:

- teeth with mobility of the III degree are removed;
- teeth with mobility of the II degree, if there is atrophy of more than 2/3 of the hole must be removed;
- teeth with mobility of the first degree with atrophy of the hole more than half of the periodontitis is removed!
- in case of exacerbation of chronic periodontitis, the tooth is not included in the splint;
- teeth with grade II mobility and chronic pericarp foci, even if the channels are well filled, are not subject to splinting;
- the presence of a fistulous passage is a contraindication to including the tooth in the splint block, even if the channel is sealed.

To be splinted:

- teeth with mobility of the first degree with atrophy of the well more than half for periodontal diseases!

- In case of chronic periapical changes, teeth with grade I mobility and well-filled root canals should be splinted.

In case of poor obturation of the root canal, the tooth can be inserted into the splint only in the absence of changes in the apical periodontium and a calm clinical course (absence of pain before treatment and 3-4 weeks after it).

Depending on the topography of the dentition defect, the prevalence and degree of periodontal destruction, permanent structures can be: a) non-removable



(Fig. 3.18.)

b) removable and c) combined.

Indications for non-removable splints

1. Splinting of a certain group of teeth.
2. Elimination of pathological tooth mobility in three directions.
3. Creating blocks of certain groups of teeth to balance the strength ratios of the periodontal endurance of the antagonizing teeth.

Positive properties of fixed tires

1. The ability to block the system in three directions: vertical, transversal, and medial, leaving the gingival pocket open (the exception is the block of complete crowns),

making it available for medical and surgical (curettage) therapy;

2. Rapid habituation to fixed tires, and phonetic

disorders occur rarely and are quickly eliminated without the help of a doctor.

Negative properties of fixed tires:

1. The need for dental preparation, accompanied by a gross injury to the enamel and dentin.

2. The use of pin splints involves the removal of pulp, which, when filling channels, creates a risk of developing apical periodontitis.

3. Non-removable splints are difficult to apply when the teeth are fan-shaped.

4. The structures of the cap tires are fragile and break along the soldering line, cementation takes place.

5. Non-removable splints worsen oral hygiene. When designing non-removable splints, the block includes not only teeth with mobility, but also teeth with healthy periodontitis on both sides!

Splints for front teeth

* Tires on the tab

* Beam tires

* Ring tire

* Cap tire

- * Half - crown tires
- * Tires mounted on root pins
- * Full crown splints

Splints for lateral teeth

- * Tires on tabs
- * Beam tires
- * Caps, half-crowns, and tires with equator crowns
- * Tires made of full crowns

* Bridge splints are dentures that simultaneously replace the defective dentition and splint the remaining teeth, but as a support one cannot limit oneself to teeth with "sick" periodontitis, it is necessary to include teeth with intact (healthy) teeth on both sides periodontal disease! It should also be remembered that in the construction of a bridge prosthesis, the supporting teeth carry not only their chewing load, but also the missing teeth.

Removable splints can also be installed in the absence of some teeth, and create good conditions for oral hygiene, therapy, and surgical treatment if necessary (Figs.3.19-20)

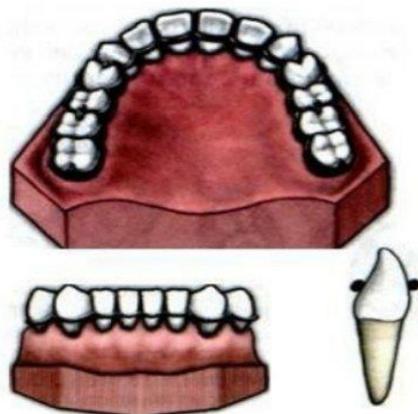


Fig. 3.19. Elbrecht splint like

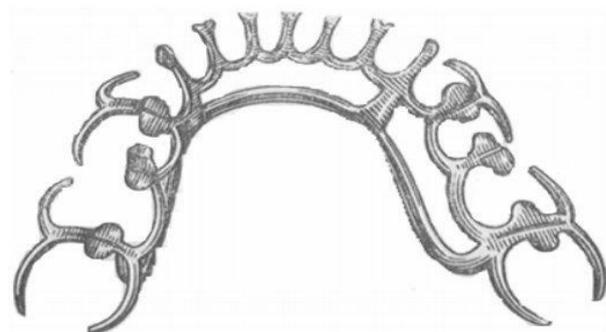
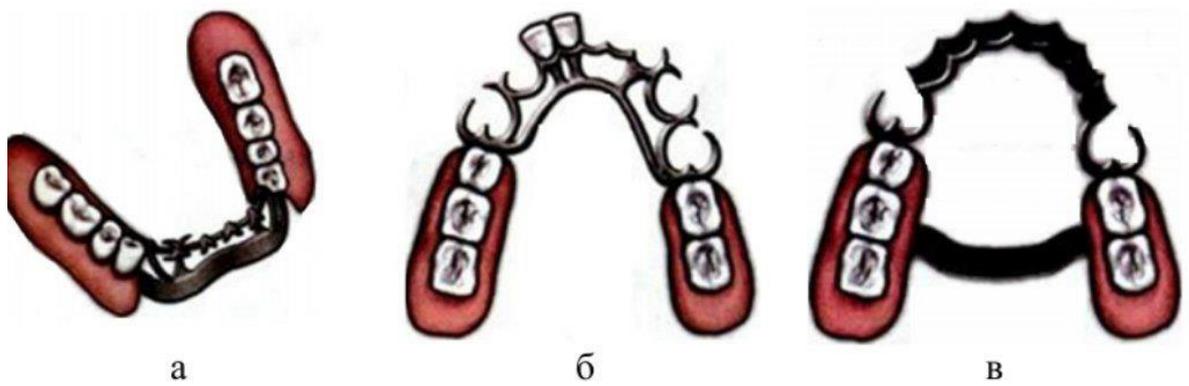


Fig. 3.20. Removable splint with claw-like appendages for fixing the lower front teeth



They are usually part of the prosthesis. These are continuous clasps, claw-like processes, occlusal pads, etc.

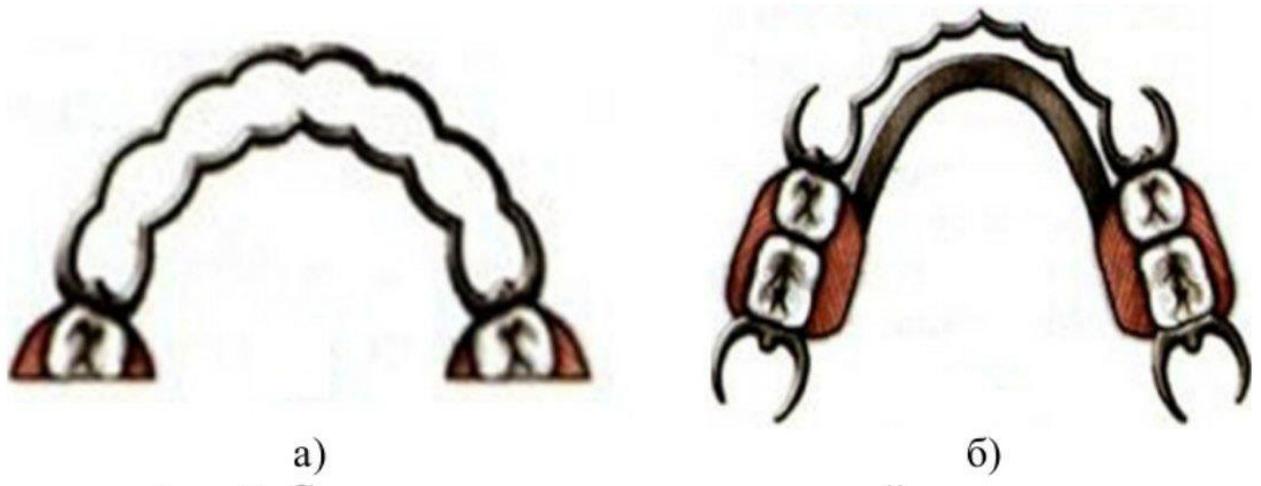
Fig. 3.21. Butt (arch) prosthesis

a, b – with claw-shaped pads and splinting clamps;

b) for the teeth of the lower jaw



3.22. Removable denture splint for the upper jaw



3.23. Removable denture splint for the lower jaw

a) with a circular clamp for splinting the front teeth of the upper jaw;

b) with continuous clamp

Advantages. Removable splints are easy to clean, less harmful to oral hygiene. Aesthetic violations are minimal. It is also possible to use them to prevent functional overload of the periodontium, with dental defects with signs of periodontal disease, but without pathological tooth mobility.

Removable splints are manufactured in the laboratory, and manipulations are reduced in the patient's oral cavity. This also applies to the advantages of this type of splinting.

Disadvantages. High precision is required in their manufacture.: the mandatory use parallelometry and precision casting on refractory models. If the accuracy of applying and removing the splint is violated, periodontal overload of individual teeth is possible.

Indications for removable splints

1. Horizontal mobility of teeth in the absence or presence of a dentition defect with a relatively uniform cavity resorption within 1/2 and even more if there is no vertical mobility, and the periodontal force ratios of the antagonizing teeth are in dynamic equilibrium.

2. Distally unlimited defects and defects that are due to the values cannot be eliminated with non-removable splint prostheses.

3. Removable structures combined with non-removable dentures (with the stabilization of a group of teeth or in combination with the Tiller design)



Fig. 3.24. Tiller arm prosthesis

a) with a groove in the front section;

b) crowns with a soldered rod corresponding in size to the groove in the prosthesis

Removable splinting arch prostheses used for partial tooth loss are indicated for large embedded defects (3-4 missing teeth or more), terminal defects, but with stable or inactive teeth in the anterior region, as well as in the absence of a sufficiently strong distal support.

Removable splinting arch prostheses allow for transverse (parasagittal) stabilization, and the inclusion of multi-link clamps in the prosthesis design allows additional support from the oral surface, which allows for the creation of circular fixation (can be made of metal alloys and thermoplastics).

TOPIC 4. DEONTOLOGICAL AND TECHNOLOGICAL ERRORS OF THE GENERAL DENTAL PRACTITIONER IN THE TREATMENT OF PERIODONTAL DISEASES: CAUSES AND PREVENTATION OF COMPLICATIONS

Deontological errors (insufficient psychological training, lack of empathy) and technological errors (improper hygiene, poor-quality treatment, lack of prevention) of the dentist in the treatment of periodontitis lead to complications due to non-compliance with protocols, ignoring the individual characteristics of the patient and insufficient information. For prevention, it is necessary to improve training and communication with the patient, observe proper oral hygiene, as well as conduct timely and high-quality professional treatment and preventive examinations.

Deontological errors

- ***Insufficient psychological preparation of the patient:*** Ineffective explanation of the need for treatment, ignoring the patient's fears and anxieties.
- ***Lack of empathy:*** Disrespectful attitude towards the patient, ignoring his complaints and questions.
- ***Insufficient information:*** Lack of complete information about the disease, its progression and treatment methods.

Technological errors

- ***Improper oral hygiene:*** Insufficient patient training in proper dental cleaning, which leads to the formation of plaque and tartar.
- ***Poor-quality treatment:*** The use of outdated or ineffective treatment methods, incomplete removal of dental calculi, poor-quality polishing of teeth.

- ***Lack of prevention:*** Insufficient emphasis on occupational hygiene, improper prescribing of procedures, for example, incorrect selection of fluoridating agents or antiseptics.
- ***Ignoring individual characteristics:*** Ignoring age, health status (diabetes mellitus), genetic predisposition, bad habits (smoking), and other risk factors.

Treatment of periodontal diseases is based on the principles of an individual and comprehensive approach to each patient, taking into account the data of general and local status. Considering that the pathological processes periodontal diseases develop against the background of many common diseases, as well as the effect of periodontal diseases on many body functions, including the mechanisms of natural defense. Treatment of patients should be aimed not only at eliminating the pathological process in periodontal tissues, restoring their function, but also at rehabilitating the general condition, restoring normal homeostasis, stimulating the body's defenses.

As early as possible, each patient should have a strictly individual, specific complex therapy plan, which is entered into the medical examination card or medical history. A periodontist, surgeon, orthopedist, physiotherapist, and general practitioners (internist, endocrinologist, cardiologist, and immunologist) should participate in the preparation of a treatment plan. It is advisable that a joint consultation take place after the examination of the patient.

The most important component of the complex therapy of diseases. Periodontal diseases are local interventions. They are carried out taking into account the clinical and morphological features of the disease, the nature of the course, the phase of development of the pathological process, and the general condition of the patient.

Local treatment is a conditional concept. The elimination of local traumatic factors and the inflammatory process is also of general health importance, as well as the improvement of the general condition and the rational treatment of

background pathology ensure the effectiveness of local therapy in a shorter period of time. On the contrary, deterioration of the general condition leads to an exacerbation of the pathological process in periodontal tissues.

Regardless *of the cause* of the disorders in periodontal tissues, the focus of local and general therapy is the same. It is carried out in a certain sequence: professional oral hygiene, treatment of caries and its complications, treatment of hypersensitivity of hard tooth tissues, drug anti-inflammatory therapy, elimination of local irritants, traumatic occlusion, treatment of periodontal pockets with the inclusion of various surgical methods, orthopedic treatment (splinting, prosthetics, elimination parafunctions, bruxism, increased erasure), orthodontic treatment, the use of physical methods that regulate tissue metabolism and microcirculation in periodontal tissues. Along with dental care, the treatment and elimination of general somatic disorders of the patient is carried out.

One of the important aspects for improving the patient's condition is the observance of general hygienic measures: daily and thorough oral hygiene using all available means (toothpastes, brushes, brushes, dental floss, mouthwash, irrigator), compliance with diet, work, rest, healthy lifestyle, rejection of bad habits (smoking, alcohol).

An important role belongs to a rational and nutritious diet, the correct ratio of proteins, fats, carbohydrates, and minerals in food. Food products should contain choline, lecithin, methionine, lipocaine, which is rich in cottage cheese, cabbage, legumes, egg white, barley and oatmeal, fish.

Literature data indicate significant discrepancies in the assessment of the effectiveness of therapeutic measures for periodontal diseases.

This is due to the lack of not only a differentiated approach to the treatment of a particular periodontal pathology, but also the usefulness of comprehensive measures and well-conducted medical examinations.

For example, if good long-term results of severe and moderate periodontitis treatment are reported only with the help of therapeutic and physical methods, then it is difficult to believe, since without orthopedic intervention is almost impossible to achieve an effect with a far-reaching process. This fully applies to general therapy for all types of periodontal lesions without local treatment.

Thus, the criteria for cure should be strictly differentiated in relation to different nosological forms.

In catarrhal and ulcerative gingivitis, the following indicators can be taken as criteria for cure: disappearance of unpleasant subjective sensations, iodine negative reaction during the Schiller test —Pisareva's disease, absence of bleeding gums, unchanged indices of PMA and hygienic, absence of periodontal pockets and signs of inflammatory resorption of interdental bone septa upon examination after 1 year or more.

It should be noted that generalized forms of catarrhal gingivitis, which have developed against the background of any somatic disease, are characterized by a persistent course and require long-term treatment. It is easier to treat localized forms of catarrhal gingivitis when a local cause is established (poorly constructed dentures, dental deposits, poor-quality fillings, etc.) and anti-inflammatory therapy usually have a lasting effect quickly.

It is more difficult to treat hypertrophic gingivitis, especially those that have developed due to prolonged use of diphenyl (hydantoin), the fibrous form of juvenile gingivitis and other diseases caused by endocrine pathology, when the proliferation of gingival papillae is so pronounced that it is impossible to return to the initial morphophysiological state, even, for example, after the withdrawal of diphenine and the elimination of the inflammatory process.

Considering the great role of surgical methods, the criteria the following objective data can be considered as a cure for hypertrophic gingivitis: normal size, color and consistency of the gingival papillae, absence of periodontal

pockets, changes in the bone tissue of the alveolar processes, relapses over several years.

The presence of mild inflammatory phenomena of the marginal periodontal, especially after gingivectomy, cryoelectrosurgery with sclerosing therapy, should be considered a completely satisfactory outcome of the treatment of hypertrophic gingivitis. Complete restoration of the shape, consistency, and color of the gingival papillae is possible only in edematous stages of hypertrophic gingivitis.

As for periodontitis and periodontal disease, the term "cure criterion" can be applied to them very cautiously; it is more appropriate to talk about the stabilization (remission) of the process in periodontal tissues. Remission occurs only as a result of comprehensive treatment (training and monitoring of oral hygiene, anti-inflammatory, surgical treatment, splinting, prosthetics, etc.).

The following signs are characteristic of periodontitis in remission.

1. The gums are uniformly pale pink in color, tightly adhering to tooth surfaces. Other attachment of the epithelium to the tooth is possible (not in the area of the enamel-cement joint). Exposure of the neck and part of the tooth root is possible.

2. The depth of the periodontal pocket remains the same, and after some types of surgical treatment, the pocket may be missing or its depth may not exceed 1-2 mm, which is determined by light probing.

3. There are no signs of an active process on X-rays: there are no foci of osteoporosis, the bone tissue is compacted, and there is no progressive loss of it.

4. Dental function, diction, and aesthetics have been restored.

Bearing in mind the mild form of periodontitis, a set of indicators can be considered a more or less reliable criterion of cure: the absence of progression of the process in periodontitis (constant pocket depth, immobility of teeth), good

general condition of the patient (data from a general clinical examination), the absence of an increase in PI indices, etc., Kulazhenko samples, stable X-ray picture.

In case of localized periodontitis, after the elimination of the local cause and appropriate treatment using bone if necessary, complete restoration of bone tissue, the disappearance of osteoporosis and the elimination of the periodontal pocket can be observed.

Stabilization of the pathological process in periodontal tissues is primarily the absence of relapses, the subsiding of inflammatory phenomena (absence of suppuration from periodontal pockets, swelling, bulging of granulation tissue from pockets), strengthening of teeth, restoration of their function, the appearance of foci of bone density, especially in those areas where osteoporosis was previously detected. With cytological the study of the periodontal pocket fluid shows a significant decrease in the number of polymorphonuclear leukocytes, the disappearance of fusospirochetosis, normalization of the structure of epithelial cells, i.e. the tendency to normalize the cytological picture of the fluid can be regarded as an objective criterion for the stabilization stage of the pathological process.

Due to the possible involvement of autoimmune mechanisms in the development of inflammatory and destructive changes in periodontal tissues, as well as the use of immunological methods in periodontology in recent years.

The Uanier reaction can be used as criteria for the effectiveness of periodontitis treatment. The detection of a negative or weakly positive reaction of Uanier indicates the elimination or subsiding of the phenomena of autosensitization. It is quite obvious that when studying periodontal pathology, almost the entire range of immunological studies can be used (if there is an immunological laboratory).

Unfortunately, it is not possible to talk about the criteria of cure for histiocytosis X, since without a clear understanding of them.

The etiology and pathogenesis of symptomatic treatment have not yet been able to stabilize the pathological process in periodontal tissues.

The main criteria listed above are the most informative evidence of the dynamics of clinical manifestations of periodontal diseases during treatment. Of course, all the tests recommended for examining patients with periodontal diseases can be used to evaluate its results.

The search for optimal therapies for periodontal diseases is possible provided that their effectiveness is objectively assessed. For this purpose, it is necessary to select clinical tests that not only reflect the periodontal status in detail, but also meet the requirements of information content and statistical effectiveness. The latter means that one should strive to choose features that are as accurately measurable as possible and have a normal or approximately normal distribution.

4.1. Management of patients in remission.

After an appropriate comprehensive course of treatment, generalized periodontitis goes into remission. This condition is regarded as stopping the development of pathology at the level from which treatment was started. At this stage, the clinical picture of periodontitis is manifested by the absence of complaints, the patient's gums are pale pink and fit snugly to the teeth, there are no inflammatory phenomena, the necks of the teeth are exposed, the X-ray of the alveolar process it shows signs of stabilization of the process: there are no phenomena osteoporosis, obviously compaction of the bone tissue of the interdental septa, restoration of vertical plates. During the period of remission, repeated treatment courses are conducted aimed at stabilizing and preventing exacerbation of chronic periodontitis.

The best organizational form of care for patients with periodontal diseases is medical examination, which includes a number of preventive and curative measures.

Medical examination is an active method of dynamic monitoring of the health status of an almost healthy population, as well as patients, having long-term chronic diseases.

Medical examination tasks:

1. active identification of people with periodontal tissue diseases;
2. Targeted examination;
3. qualified treatment of patients;
4. dynamic monitoring of the course of periodontal tissue disease;
5. Dental educational work.

When starting a medical examination, the doctor sets himself the following tasks:

1. Identification of persons with the absence of pathology in periodontitis, but with the presence of conditions for its occurrence and development, and taking this the contingent is registered at the dispensary. This group should include people with malocclusion, with pathology of internal organs and body systems, which is often accompanied by periodontal pathology.

It is quite difficult to perform this task, and all dental specialists, regardless of their narrow specialization, should participate in its resolution.

2. Identification of persons with existing periodontal pathology and their admission to the dispensary for systematic monitoring and timely treatment. Performing this task is the responsibility of doctors of periodontal departments and offices.

To solve these problems, the dental service plans the following activities::

- Preventive measures aimed at preventing the occurrence and development of periodontal pathology in people with predisposing factors. These measures include: correction of malocclusion, surgical removal of oral anomalies (bridles and folds of the vestibule, shallow vestibule of the oral cavity, and others), replacement of irrationally manufactured dentures, fillings, improvement of oral hygiene, recommendations on nutrition, work, and rest.

- Measures aimed at eliminating periodontal pathology through appropriate pathogenetic and symptomatic therapy.

- Measures aimed at preventing the development of complications and stabilizing the pathological process in periodontitis.

3. Principles of medical examination of patients with periodontal pathology.

Medical examinations should be carried out in all dental institutions. The best form of organization of dispensary work for periodontal diseases is the creation of periodontal departments at large polyclinics, where the patient can receive comprehensive assistance and possible consultations with other specialists.

Principles of medical examination of patients with periodontal pathology:

Early detection of risk factors in healthy people and diagnosis of early forms of periodontal diseases.

An individual approach to the planning and implementation of therapeutic measures, taking into account the form of the disease, the nature of the course and the depth of the lesion.

4.2. Definition of medical tactics, dynamic observation, recommendations for rehabilitation with the appointment of optimal repeated courses of therapy.

Grouping of patients depending on the type of tissue disease periodontal disease, severity, age of the patient, prescription and form of the disease course.

Assessment of the periodontal condition using a set of diagnostic methods at the initial visit to the dentist, during the course of therapeutic and/or preventive measures, as well as during dynamic monitoring after the courses of treatment and prevention.

The appointment of measures, specific secondary prevention or treatment aimed at eliminating or minimizing common and local periodontopathogenic factors.

□ Teaching patients the rules of rational individual hygiene oral cavity, individual selection of hygiene products and items, controlled oral hygiene.

Stages of medical examination:

1 - selection of patients;

2 - the actual medical examination (active observation and treatment).

After the selection, the grouping is carried out depending on the type of periodontal tissue disease, severity, age of the patient, prescription and form of the disease course. There are 5 groups of patients with periodontal diseases:

Group I – patients without clinical signs of periodontal disease (healthy), their examination should be carried out once a year. The purpose of the dispensary an inspection is a quality control and correction of oral hygiene.

The main therapeutic and preventive measures include: training in the rules of rational individual oral hygiene, individual selection of hygiene products and items, and controlled oral hygiene.

Risk group II - patients with preclinical stages of the pathological process in the presence of risk factors (malocclusion, short frenules of the lips, tongue, shallow vestibule of the oral cavity, burdened with common diseases). Events are held for patients in this group, pathogenetic and symptomatic therapy is carried out to eliminate or weaken the effects of causal factors. Patients in this group should be examined 1-2 times a year.

Group III (compensated) – patients under the age of 50 with gingivitis, periodontitis and periodontal disease of mild severity. All patients receive comprehensive treatment (according to indications — therapeutic, orthodontic, surgical and orthopedic).

Patients should be trained in proper individual oral hygiene, consultation, treatment, and dynamic follow-up with doctors of other specialties, prescribe restorative therapy. With mild periodontitis and mild gingivitis, patients are examined once a month for the first 3 months, then once every 3 months, then once every 6 months (2 times a year) to prevent complications, reduce the frequency of relapses and stabilize the pathological process.

Group IV (subcompensated) - patients with gingivitis, periodontitis and periodontal disease of moderate severity on the background of general somatic diseases. Dentist together with other doctors specialists carry out local and general treatment, complex etiopathogenetic therapy. This group, with an average severity of periodontitis, should be examined once every 10 days for the first month, then 3 months - once a month, then once every 3 months (3-4 times a year).

Group V (decompensated) – patients with severe generalized periodontitis on the background of general somatic diseases, with idiopathic periodontal diseases.

It is advisable to use inpatient conditions for in-depth examination and treatment of patients.

It should be registered at a dispensary (from 6 months to 1 year) in order to monitor comprehensive treatment. Patients in this group need to restore the function of the maxillary system by splinting and/ or prosthetics, and at the same time they undergo conservative therapy. After the prostheses are made, surgical treatment is performed (curettage, gingivosteoplasty, etc.). Patients should be examined immediately after prosthetics, and then 3-4 times a year.

Control calls pursues the following objectives:

- 1) monitoring the dynamics of the process;
- 2) corrective treatment;
- 3) preventive measures;
- 4) Tips on good oral hygiene;
- 5) recommendations for a special diet.

Experience shows that all patients need supportive treatment courses in the first year of follow -up, 2/3 of patients need them in the second year, 1/3 of those observed in the third year, and individuals in the fourth year. Moreover, the volume of intervention is narrowing with each repeated course and it takes less and less time to conduct such courses.

During the medical examination, as a rule, there is screening of some of those registered. This phenomenon is associated with insufficient explanatory work among patients about the consequences of periodontal pathology without proper treatment. With well -conducted sanitary and educational work, the dropout rate can be significantly reduced.

Before admission to the dispensary, each patient should be examined by dentists, internists, surgeons and orthopedists in order to jointly outline a comprehensive treatment plan. Only under this condition can the medical examination be successful. According to modern according to the concepts, the patient is managed by a periodontist, who fully implements comprehensive measures, with the exception of complex surgical corrections.

With well-established dispensary work, with the correct selection of a contingent for medical examination, it is possible to successfully prevent the appearance of severe advanced forms of the disease, leading to irreversible loss of supporting structures, impaired chewing function of teeth and a number of adverse changes in the general condition of the body.

In addition, the problem can be successfully solved as part of a medical examination prevention of the initial stage of periodontal disease.

The following criteria have been introduced for the annual expert assessment of the periodontal condition of each dispensary patient:

1. Improvement – the condition is assessed only by the subjective feelings of the patient and the doctor.

2. Clinical well-being - after treatment, the gums are dense, pale pink in color, and there is no bleeding or dental deposits.

Radiologically, this condition may not be confirmed.

3. Remission is a periodontal condition with no signs of an active process for 1 year.

4. Stabilization – a state of remission for 2-3 years. Stabilization and

Remission is assessed by clinical data and confirmed by laboratory, functional, and X-ray examination methods.

5. No changes – when treatment does not lead to remission or deterioration.

6. Deterioration – the process is progressing, there are frequent relapses and complications.

Medical examination is a more advanced form of dental work among the population, taking into account the individual characteristics of the general state of health and dental status at all ages. In case of remission of the process in patients from the decompensated group they are transferred first to the subcompensated group, and then to the compensated one. When the process stabilizes, they are considered at risk and/or practically healthy. The criterion for de-registration of a patient is clinical recovery or stable remission as a result of the elimination of causal and predisposing factors (there has not been a single

exacerbation for two years, and radiologically there is no progression of destructive processes in the tissues).

Prevention is a complex of state, collective, and individual measures aimed at preventing diseases, detecting their early manifestations, and preserving human health.

Very important in the organization of specialized periodontal care is an integrated approach to the examination and treatment of patients, which requires the participation of dentists of all profiles (therapist, surgeon, orthopedist, orthodontist, pediatric dentist), as well as doctors of other specialties.

To date, most authors admit that inflammatory periodontal diseases usually begin with % of the inflammatory process in the marginal periodontium as a result of pathogenic effects of microbial plaque toxins. The inflammation that develops in this case takes on a chronic character over time, recurs and gradually spreads to the underlying parts of the periodontium, eventually acquiring features typical of periodontitis.

The development of acute inflammatory reactions in the marginal part of the gum is usually associated with a violation of oral hygiene and the subsequent influence of microbes.

In this case, special importance is attached to dense subgingival plaque or bacterial plaque.

The following types of microorganisms most often cause the inflammatory process: *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis*, *Bacteroides forsythus*, *Campylobacter rectus*, *Eikenella corrodens*, *Peptostreptococcus micros*, *Selenomonas* species, *Tubacterium* species, *Streptococcus intermedius*, *Fusobacterium nucleatum*, etc. Pathogenic bacteria produce a number of substances that have a pronounced damaging effect on tissue substrates.

It is important to make all preventive work as personal as possible, the only way to influence the formation of a patient's motivated approach to the preventive measures offered to him.

The initial signs of periodontal damage in the form of bleeding gums are already found in children aged 6-7 years. With age, the prevalence and intensity of periodontal diseases increases. According to WHO data, a high level of periodontal diseases was noted both in the young age group of 15-19 years (55-99%) and at the age of 35-44 years.

Indicators of the prevalence and intensity of periodontal diseases allow us to calculate the need for treatment using the CPITN index (index of need for treatment).

The lack of preventive measures and qualified dental care leads to an increase in the need for specialized periodontal care.

Medical examination is an active method of dynamic monitoring of the health status of an almost healthy population, as well as patients with long-term chronic diseases.

Dental medical examination is based on the rehabilitation of the oral cavity, the elimination of concomitant diseases, and preventive work in organized groups.

There are 3 dispensary observation groups:

- Group 1 — healthy people who do not have any pathology of teeth and oral mucosa;
- Group 2 — practically healthy people with a history of any acute or chronic disease that does not affect the function of vital organs;
- Group 3 — people with chronic diseases with compensated, sub- and decompensated course.

In the second phase of medical examination, contingents are formed by observation groups, uniform criteria of continuity and follow-up stages, dispensary patients are rationally distributed among doctors, and the needs of the dispensary populations in outpatient and inpatient treatment are met.

The objectives of the third phase are to determine the nature and frequency of dynamic follow—up, adjust diagnostic and therapeutic measures in accordance with changes in health status, and evaluate the effectiveness of follow-up.

It is very important to identify and distinguish nosological forms, regarding which patients are subject to follow-up by a general practitioner. To solve this problem in practice, it is necessary to create a list of dental diseases that require long-term special treatment and patient monitoring. In choosing a nosological form for observation by a dentist, the determining factor is the chronic course of dental disease, which not only causes a violation of the function of the CHLO organ, but also poses a threat to the development of serious pathological processes in other human organs and systems.

The selection of dental patients in need of dispensary supervision is carried out during preventive examinations (preliminary, periodic, targeted, patient visits to dental clinics, departments, etc.). It is conducted by all dentists, regardless of the profile and place of admission of patients. Patients in need of dental care are referred to dental institutions at their place of residence, work or study.

The following terms have been introduced for the annual expert assessment of the periodontal condition of each dispensary patient:

1. Improvement – the condition is assessed only by the subjective feelings of the patient and the doctor.

2. Clinical well—being - after treatment, the gums are dense, pale pink in color, and there is no bleeding or dental deposits. Radiologically, this condition may not be confirmed.

3. Remission is a periodontal condition with no signs of an active process for 1 year.

4. Stabilization – a state of remission for 2-3 years. Stabilization and remission are assessed by clinical data and confirmed by laboratory, functional, and X-ray examination methods.

5. No changes – when treatment does not lead to remission or deterioration.

6. Deterioration – the process is progressing, there are frequent relapses and complications. Medical examination is a more advanced form of dental work among the population, taking into account the individual characteristics of the general state of health and dental status at all ages. In case of remission of the process, patients from the decompensated group are transferred first to the compensated group, and then to the compensated one. When the process stabilizes, they are considered at risk and/or practically healthy.

The criterion for de-registration is clinical recovery or permanent remission as a result of elimination of causal and predisposing factors.

4.3. Prevention of complications

- ***Professional development of the doctor:*** Regular training in new treatment methods, use of modern technologies, improvement of communication skills with the patient.
- ***Patient training:*** Detailed explanation of oral hygiene rules, proper selection of care products (brush, paste, floss).
- ***Individual approach:*** Taking into account all risk factors and patient characteristics when choosing treatment and prevention methods.
- ***Regular checkups:*** Periodic professional checkups for the timely detection and treatment of periodontal diseases.
- ***Comprehensive prevention:*** A combination of professional dental cleaning, fluoridation, the use of antiseptics and other recommendations.

Currently, it is customary to distinguish primary, secondary and tertiary prevention of dental diseases.

Primary prevention involves the use of various methods and means to prevent the occurrence of dental diseases. If the initial signs of damage have appeared, then as a result of preventive measures, they may stabilize or reverse development.

Secondary prevention is the use of traditional treatment methods to stop the developing pathological process and preserve tissues. These methods include the treatment of dental caries (fillings, endodontic procedures), therapeutic and surgical treatment of periodontal diseases, and treatment of other oral diseases.

Tertiary prevention is the replacement of lost function with using means to replace missing tissues, and carrying out rehabilitation of patients, bringing their condition as close to normal as possible.

The methods of primary prevention include: individual oral hygiene, professional oral hygiene, endogenous use of fluoride preparations, the use of local preventive measures, dental education of the population.

Professional oral hygiene is performed at an appointment by a dentist or hygienist. The frequency of professional training cleaning is determined individually and depends on the hygienic condition of the oral cavity, the intensity of caries and the intensity of inflammatory periodontal diseases.

Individual oral hygiene is the main method of primary prevention of dental diseases. It includes the following items: regular and proper brushing of teeth; the use of high-quality toothbrushes and pastes; the use of additional means for prevention (floss, interdental brushes, irrigators, tongue cleaning devices, etc.).

In recent years, electric toothbrushes have appeared, the use of which is considered appropriate. Having a good toothbrush in your arsenal is very important, but it is equally important to brush your teeth properly.

Currently, various methods of plaque removal are known: the circular Fones method, the Leonard method, the Bass method, the Charters method, the Stillmann, modified Stillmann method, standard method of brushing teeth (Pakhomov G.N.)

Dental education of the population is one of the main components of any prevention program. This is a concept it implies providing the population with accessible information about the risk factors and causes of dental diseases, as well as about the main methods and means of their prevention.

The main directions of dental education conducted for the prevention of periodontal diseases include information on risk factors for periodontal diseases, the role of oral hygiene and nutrition, the role of bad habits in the development of periodontal diseases, and the need for regular preventive dental checkups (at least 2 times a year).

Sanitary and educational work can be carried out by various methods and forms. This can be an individual conversation, or a group one, or a radio and television appearance. The work can be carried out in the form of hygiene lessons, the release of sanitary bulletins, information leaflets, etc.

The main principles of the medical examination system are planning, complexity, the choice of a leading link from the general complex of therapeutic and recreational measures that are crucial for a particular type of pathology, and a differentiated approach to health measures, taking into account the situation.

During the medical examination, it is planned to identify early forms of the disease and risk factors, carry out a complex of therapeutic and preventive, social and hygienic measures to preserve the function of the maxillary system and carry out dynamic monitoring.

4.4. Dynamic monitoring and prediction of treatment outcomes for patients with inflammatory periodontal diseases

Dynamic monitoring of patients with inflammatory periodontal diseases is carried out with a frequency of 1 every 3-6 months, depending on the severity of the disease.

Predicting the course of the disease and the effectiveness of treatment involves:

- analysis of the clinical manifestations of the local inflammatory and destructive process,
- age of the patient,
- socio—economic conditions of the patient's life,
- patient's attitude to the disease,
- presence of bad habits,
- the nature of concomitant diseases, immune status.

The presence of background diseases in the patient, such as diabetes mellitus, thyroid diseases, and cardiovascular diseases. It significantly affects the prognosis and may worsen the course of chronic periodontitis. With concomitant diseases, as a rule, the duration of the course of treatment increases, and there is a need for more frequent supportive periodontal therapy. However, in all cases, the need for therapeutic measures remains.

When determining the prognosis of individual teeth, a number of clinical parameters are evaluated:

- the continuity of the dentition,
- the degree of tooth mobility,
- the depth of periodontal pockets,

- the level of destruction of bone tissue,
- the condition of adjacent teeth,
- the nature of the transitional folds,
- the level of attachment of frenules,
- the degree of furcation involvement in the lesion,
- the presence of carious and non-carious lesions of the teeth and root,
- the presence of morphological features in them (left drops, longitudinal grooves in the gingival zone, violation of the profile of the crown surface).

Special attention should be paid to the condition of the joint in the area of teeth adjacent to the adentia zone, removal of unpromising teeth improves the prognosis of treatment in the long term. An important aspect is the patient's compliance, willingness to cooperate, and individual ability to maintain oral hygiene. Forecasting in periodontics is a complex issue that affects the interests of both the patient and the doctor. It is impossible to answer it with sufficient probability after the first visit. This requires initial therapy and 2-3 courses of periodontal maintenance therapy, when the doctor gets the opportunity to observe the body's response to the treatment.

CONTROL QUESTIONS

1. What is periodontal disease?
2. Age-related changes in periodontal tissues?
3. What is the "periodontal reserve forces"?
4. What is an odontoparodontogram used for?
5. Factors on which the periodontal reserve forces depend
6. What is traumatic occlusion?
7. Clinic of primary and secondary traumatic occlusion and their differential diagnosis.
8. What is an atrophic unit, a functional center, a direct and reflected traumatic node?
9. Clinic of the stage of compensation and decompensation.
10. Types of orthopedic treatment for traumatic occlusion.
11. Classification of premature contacts.
12. Indications for selective polishing.
13. Methods of selective grinding.
14. The Jenkelson method.
15. The Schueller method. 6. Methods of diagnosis of premature contacts.
16. Groups of errors and complications during selective polishing.
17. Possible complications during selective polishing.
18. Prevention of complications during selective grinding.
19. What is splinting? Indications for splinting teeth.
20. Biomechanics of tires. Requirements for tires.
21. Classification of tires.
22. Types of stabilization.
23. Indications for temporary splinting.
24. Requirements for temporary tires.

25. Methods of temporary splinting.
26. Indirect glass fiber manufacturing technology.
27. Direct fiberglass tire manufacturing method.
28. Cable-stayed splints.
29. Types of temporary buses.
30. Indications for the inclusion of teeth in the splint.
31. Types of fixed tires.
32. Advantages and disadvantages of fixed tires.
33. What is permanent splinting and indications for it.
34. Advantages and disadvantages of removable splints.
35. What structures are used as removable tires?
36. What is direct prosthetics?
37. Indications for direct prosthetics
38. Methods of direct prosthetics.
39. Disadvantages and advantages of the immediate prosthesis.
40. Contraindications to direct prosthetics.

SITUATION ISSUES

1. A 29-year-old patient went to the orthopedic dentistry clinic complaining of mobility 13, 12, 11, 21, 22, 23 teeth and intolerance to steel dentures. The patient is regularly treated by a periodontist. Mobility 13, 12, 11, 21, 22, 23 teeth of the 1st degree. X-ray picture: bone atrophy by 1/3 of the crown length, respectively 13, 12, 11, 21, 22, 23.

Make a diagnosis. To justify the orthopedic treatment plan.

2. A 39-year-old patient with complaints of tooth mobility applied to the orthopedic department of the dental clinic 21. Pain only when eating. The teeth adjacent to 21 are healthy, 21 have grade II mobility. The patient is regularly treated by a periodontist. There are no inflammatory phenomena in the area of 21. To justify the choice of prosthesis design.

3. Patient A. complained of tooth sensitivity 32, 31, 41, 42, as well as tooth mobility 33, 34, 43, 44, and hyperemia. During the survey, it was revealed that the patient had previously consulted a dentist to correct occlusal contacts. Examination revealed a shortening of the crown 32, 31, 41, 42, and in the area of teeth 33, 34, 43, 44 there is swelling, hyperemia and mobility of the III degree.

What mistakes were made?

4. A 47-year-old patient applied to the orthopedic department of the dental clinic with complaints about the presence of mobility of teeth 14, 16, 17 and the presence of defects in the dentition of the upper jaw. Teeth 14, 16, 17 have mobility of the II degree. Make a diagnosis and justify an orthopedic treatment plan.

5. Patient T., 39 years old, complained of mobility, swelling, and pain. Examination of the oral cavity revealed: mobility of tooth 31 of the II degree, edema, hyperemia. Make a treatment plan.

6. Patient S., 40 years old, complained of mobility of tooth 22 and pain when eating. On examination: the teeth adjacent to 22 are intact, 22 have grade II mobility. There are no inflammatory processes in the area of tooth 22. The patient regularly visits a periodontist. To justify the choice of prosthesis design.

6. Patient D. complained of tooth mobility, bleeding, and pain during meals. Examination of the oral cavity revealed mobility of the III–IV degree 36, 35, 34, 44, 45, 46. On the X-ray, the atrophy of the walls of the wells of the same teeth is more than $\frac{3}{4}$

Make a diagnosis. Justify the treatment plan.

TESTS

1. Which parts of the gum are:
 - a) marginal, alveolar
 - b) root, crown
 - c) lingual
2. The concept of "periodontal reserve forces" was introduced:
 - a) Courland
 - b) Gavrilov
 - c) Kenedy
3. Periodontal disease is:
 - a) a complex of tissues surrounding the tooth and having a genetic and functional community
 - b) only the ligamentous apparatus of the tooth
 - c) a complex of tissues consisting only of alveolar bone and cement.
4. Specify the methods used in orthopedic dentistry
 - a) selective grinding
 - b) temporary splinting
 - c) depulcation of teeth
5. Diagnostic models are fixed to detect supercontacts in all types of occlusion in:
 - a) articulator
 - b) the cuvette
 - c) the occluder
6. Traumatic occlusion is distinguished:
 - a) primary
 - b) secondary
 - c) tertiary

7. In case of periodontitis, selective grinding of teeth is carried out to:
- a) eliminate premature occlusal contacts
 - b) exclude individual teeth from occlusion
 - c) include individual teeth in occlusion
8. The presence of premature dental contact points is detected using:
- a) occlusograms
 - b) carbon paper
 - c) diagnostic models
 - d) visual
 - e) recordings of the movement of the mandible
9. Selective grinding of teeth in periodontitis is performed within
- a) enamel
 - b) dentine
 - c) enamel and dentine.
10. With the development of hyperesthesia, one should
- a) pay special attention to the subsequent fluoridation of the polished surfaces of the hard tissues of the teeth, which relieves or significantly reduces pain
 - b) rinse the mouth with a soda solution
 - c) perform a filling
11. Violation of the sequence of stages of selective grinding of teeth
- a) complicates the systematic manipulation and leads to the exclusion of individual stages, which significantly reduces the effectiveness of the treatment method
 - b) does not affect the effect of treatment in any way
12. If there is insufficient grinding, many premature contacts will remain
- a) untreated, and periodontal tissue injury will progress

b) untreated, but periodontal tissue injury will not occur

13. Requirements for splints:

a) create a solid block of a group of teeth, limiting their

movement in three directions: vertical, vestibulooral and mesiodistal;

b) be rigid and firmly fixed on the teeth;

c) have retention points for food retention and dental the raid;

14. Requirements for tires in terms of duration:

a) temporary

b) permanent

c) laboratory

15. Material requirements for tires:

a) metal

b) plastic

c) paper

16. Temporary splinting of teeth in periodontitis is ... the treatment of periodontitis

a) pathogenetic

b) etiological

c) symptomatic

17. Temporary splints in the treatment of periodontal diseases should

a) securely fix splinted teeth

b) conduct electric current well

c) distribute chewing pressure evenly

18. For the manufacture of a temporary splint, the preparation of the supporting teeth

is possible.

b) desirable

c) required

d) not required

19. In the advanced stage of periodontitis after orthodontic treatment, it is necessary to use

a) temporary retention devices

b) permanent splints

c) temporary splints

d) immediate prostheses

20. Indications for non-removable splints

a) teeth with mobility of the III degree

b) elimination of pathological mobility of teeth in three directions

c) teeth with mobility of the II degree if there is atrophy of more than 2/3 of the well

21. The disadvantages of removable tires include the fact that

a) high precision is required in manufacturing: the mandatory use of parallelometry and precision casting on refractory models

b) are easy to manufacture

c) are not used for end defects of the dentition

22. Under the direct plate prosthesis, the regeneration processes of the tooth socket

a) slow

down b) accelerate

c) do not change

23. To remove the impression during direct prosthetics,

a) silicone masses are used

b) thermoplastic masses

c) plaster

d) alginate masses

24. Indications for the manufacture of immediate dentures

a) multiple caries

b) tooth extraction due to periodontitis

c) dental deformities

TEST RESPONSES

**1-a, 2-a, 3-a, 4-a,b; 5-a, 6-a,b; 7- a, 8-a,b,c;, 9-a, 10-a, 11-a, 12-a, 13-a,b; 14-a,b; 15-a,b;
16-a, 17-a,b; 18-a, 19-b, 20-c, 21-b, 22-b, 23-d, 24-b.**

GLOSSARY

GINGIVITIS is an inflammation of the gums without compromising the integrity of the gingival joint, which develops due to the adverse effects of local and general factors.

PERIODONTAL POCKET is a consequence of inflammatory and destructive processes in periodontal tissues.

PERIODONTITIS is an inflammation of periodontal tissues characterized by progressive destruction of the periodontium and weakness of the alveolar process of the jaws.

PERIODONTAL DISEASE is a dystrophic lesion of periodontal tissues/

PERIODONTOMAS are tumors and tumour-like processes in the periodontium.

OSTEOPOROSIS is a progressive systemic disease characterized by a decrease in bone density, a violation of its microarchitectonics and increased fragility due to impaired bone metabolism, decreased bone strength and an increased risk of fractures.

OSTEOSCLEROSIS is a pathological condition characterized by abnormal densification (increased density) of bone tissue. This is not an independent disease, but a symptom or an X-ray sign that can be observed in various congenital, acquired, inflammatory or tumor processes.

HYPERCEMENTOSIS is a dental disease in which excessive deposition of secondary cement occurs on the root of the tooth, which leads to its thickening and deformation.

An **ODONTOPARODONTOGRAM** is a dental chart or table that graphically displays the condition of the teeth and periodontium (the tissues surrounding the tooth).

An **OCCLUSOGRAM** is a diagnostic method that allows a dentist to assess the nature and strength of the closure of the dentition (occlusion). In fact, it is an imprint that fixes all the contacts between the teeth of the upper and lower jaw in a certain position.

DENTAL SPLINTING is a dental procedure that allows you to strengthen and stabilize movable teeth by combining them into a single unit using a special design (splint). This helps to evenly distribute the chewing load, prevent further loosening and preserve teeth.

TRAUMATIC OCCLUSION is a pathological condition in which improper closure of teeth (occlusion) leads to excessive chewing load on individual teeth or groups of them, causing damage to periodontal tissues (tissues surrounding the tooth) and other disorders.

SUPRACONTACT is unwanted, premature, or excessive contact between the teeth of the upper and lower jaw. It disrupts the proper closure of the dentition (occlusion) and leads to an uneven distribution of the chewing load.

STABILIZATION is the retention of a denture in a stable position in the mouth when chewing, talking, and other jaw movements. It provides a secure fixation, preventing the prosthesis from shifting both vertically (falling out) and horizontally (shifting forward or sideways).

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