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DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

"GYNECOLOGY STUDY GUIDE"

(for undergraduate students)

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An A.V. // "Gynecology Study Guide"

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TThis study guide is designed for undergraduate medical students and provides a concise yet comprehensive overview of gynecology. It covers essential topics including the anatomy and physiology of the female reproductive system, diagnosis and treatment of gynecological conditions, reproductive health, and contraception.

The guide emphasizes the development of clinical thinking and practical skills. Each chapter is complemented by illustrations, multiple-choice tests, case-based scenarios, and open-ended questions to enhance understanding and support exam preparation.

Based on current clinical guidelines and educational standards, this guide is suitable not only for students but also for residents and educators as a supplementary resource.

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LIST OF ABBREVIATIONS AND SYMBOLS

AIDS – Acquired Immunodeficiency Syndrome

AUB – Abnormal Uterine Bleeding

BMI – Body Mass Index

BP – Blood Pressure

CIN – Cervical Intraepithelial Neoplasia

COCs – Combined Oral Contraceptives

CPI – Karyopyknotic Index

CRH – Central District Hospital

CT – Computed Tomography

FAP – Feldsher-Obstetric Station

FSH – Follicle-Stimulating Hormone

GnRH – Gonadotropin-Releasing Hormone

hCG – Human Chorionic Gonadotropin

HIV – Human Immunodeficiency Virus

HPV – Human Papillomavirus

HRT – Hormone Replacement Therapy

IUD – Intrauterine Device

IVF – In Vitro Fertilization

LH – Luteinizing Hormone

MC – Menstrual Cycle

MRI – Magnetic Resonance Imaging

NSAIDs – Nonsteroidal Anti-Inflammatory Drugs

PCOS – Polycystic Ovary Syndrome

PCR – Polymerase Chain Reaction

PID – Pelvic Inflammatory Disease

PMS – Premenstrual Syndrome

PPP – Precocious Puberty

RS – Reproductive System

SanPiN – Sanitary Regulations and Norms

STIs – Sexually Transmitted Infections

TSH – Thyroid-Stimulating Hormone

US – Ultrasound

WHO – World Health Organizat

INTRODUCTION

Gynecology is one of the most important disciplines in the medical education system, as women's health is the foundation of family well-being, societal stability, and the health of future generations. Modern gynecology encompasses not only the treatment of diseases but also a wide range of issues related to prevention, reproductive health, family planning, and a woman's quality of life at all stages of development—from adolescence to menopause.

This study guide has been developed to provide methodological support for medical students, interns, and young physicians seeking to deepen their knowledge in gynecology. It is based on up-to-date scientific data, clinical guidelines, and practical approaches used in everyday medical practice. The manual covers key aspects of women's health, including the physiology and pathology of the menstrual cycle, the mechanisms of its hormonal regulation, as well as the most common functional disorders. In addition, methods of examination used in gynecological practice are described, including clinical, laboratory, and instrumental approaches, allowing the reader to gain a comprehensive understanding of the diagnostic process.

Special attention is also given to the topic of ectopic pregnancy—one of the most serious complications encountered in obstetric and gynecological practice. Furthermore, the guide addresses topics related to contraception, sexual education, and reproductive health, which are especially important in the context of modern preventive medicine.

The creation of this guide is also aligned with the objectives outlined in the Presidential Decree of the Republic of Uzbekistan dated January 28, 2022, No. UP–60, **“On the Development Strategy of New Uzbekistan for 2022–2026.”** The document emphasizes the importance of improving the quality and accessibility of medical care for women of reproductive age, pregnant women, and children; modernizing perinatal institutions; and training qualified medical personnel capable of providing high-tech medical assistance.

The material is presented in a concise and accessible manner, making it easy to study and review. At the same time, the content reflects the current level of medical knowledge and can be used both in theoretical training and during practical sessions in clinical settings.

| An A.V.

We sincerely hope that this guide will serve as a reliable source of knowledge, help future specialists master the fundamentals of gynecology, and become a foundation for their professional development in the field of women's health care.

Chapter №1. The Normal Menstrual Cycle and Its Regulation

The menstrual cycle is a rhythmically recurring biological process that prepares a woman's body for a possible pregnancy.

Menstruation is the cyclic, monthly uterine bleeding. The first menstrual period (*menarche*) typically occurs at the age of 12–13 years, with a normal variation of ±1.5–2 years. The cessation of menstruation (*menopause*) most commonly occurs between the ages of 45 and 50.

The menstrual cycle is traditionally measured from the **first day of one menstruation to the first day of the next**.

Key characteristics of a physiological menstrual cycle:

- **Biphasic nature.** The menstrual cycle consists of two phases — the **follicular phase** and the **luteal phase**, each accompanied by specific hormonal and morphological changes in the female body.
- **Duration: 22 to 35 days.** For most women (about 60%), the cycle lasts between **28 and 32 days**. A cycle shorter than 22 days is classified as **anteponic**, while one longer than 35 days is considered **postponic**.
- **Consistency and regularity.** In a healthy reproductive system, cycles occur with clear periodicity.
- **Duration of menstrual bleeding.** A normal menstrual period lasts **from 2 to 7 days**. Menstruation that is too short or too long requires careful evaluation.
- **Physiological blood loss.** On average, a woman loses **50 to 150 ml of blood per menstruation**, including mucous secretions.
- **Absence of pain or systemic disturbances.** Normal menstruation should not be accompanied by significant pain or general health deterioration.

Regulation of the Menstrual Cycle

The menstrual cycle is regulated by a **complex neuroendocrine system**, consisting of **five key levels**:

1. **Cerebral cortex**
2. **Hypothalamus**
3. **Pituitary gland**

4. **Ovaries**
5. **Uterus**

These structures interact through **feedback mechanisms** to ensure coordinated hormonal control and cyclical reproductive function.

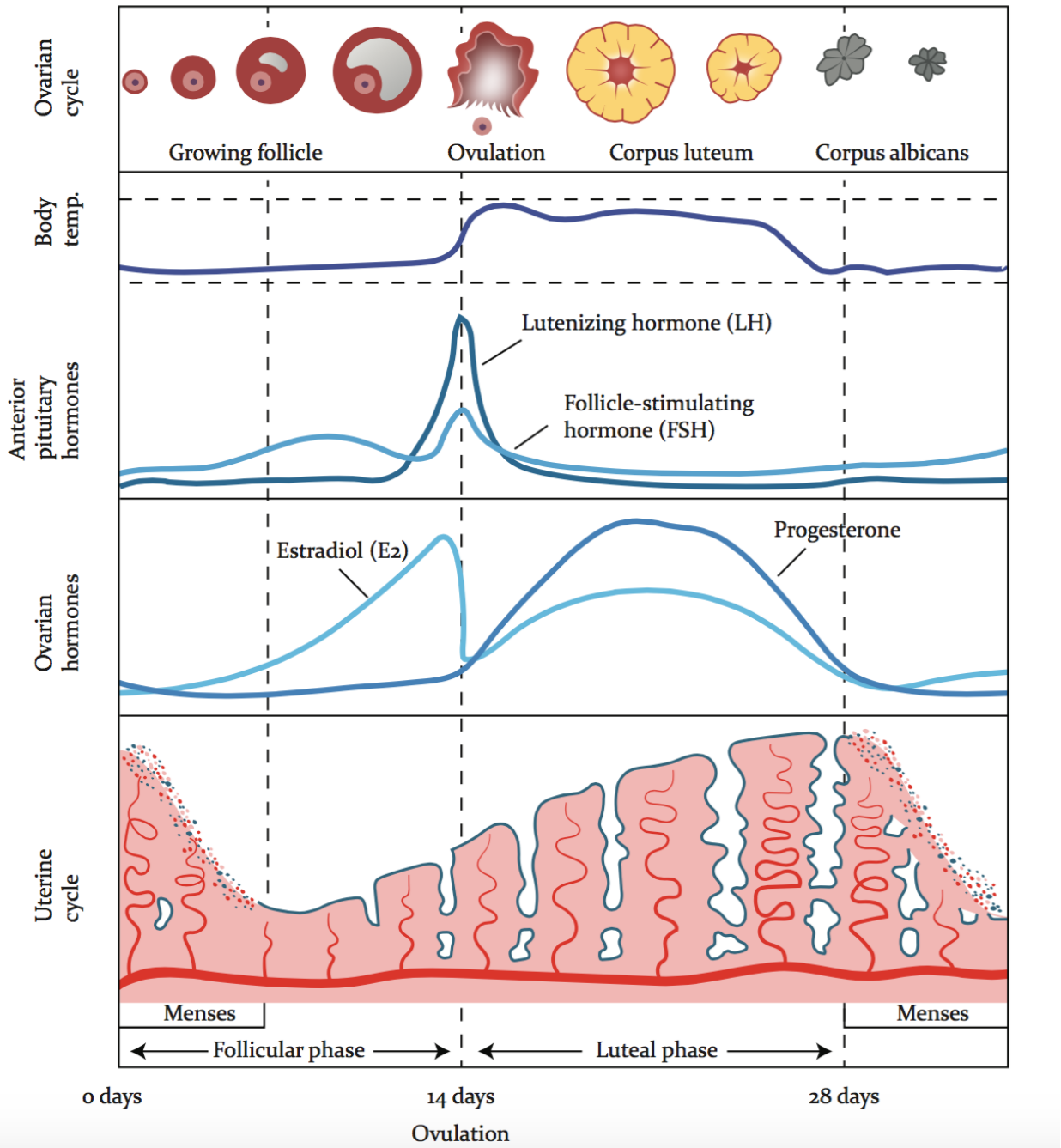

Figure 1.1. The Menstrual Cycle

I. Extragenital Cerebral Structures — First Level of Regulation

The **first level of menstrual cycle regulation** involves the **higher centers of the central nervous system**, including the **cerebral cortex**, **limbic system**, and **reticular formation**. These structures perceive signals from both the **external environment** (light, stress, social and climatic factors) and the **internal environment** via **interoceptors** that monitor the physiological state of the body.

Information is transmitted through **neurotransmitters** — chemical substances that regulate nerve impulses. The key neurotransmitters affecting the reproductive system include:

- **Dopamine**
- **Norepinephrine**
- **Serotonin**
- **Indoles**
- **Opioid neuropeptides** such as **endorphins**, **enkephalins**, and **dynorphins**

These substances influence the **neurosecretory nuclei of the hypothalamus**, stimulating them to synthesize **releasing hormones**. In this way, the higher brain structures play a crucial role in **coordinating reproductive function** with the overall physiological state and environmental conditions.

II. The Hypothalamus — Second Level of Regulation

The **hypothalamus** serves as the **central link** in the regulatory hierarchy of the menstrual cycle, acting as the **initiating mechanism** of the neuroendocrine axis. Its **neurosecretory nuclei** synthesize **releasing hormones** (*liberins*), which regulate the secretion of hormones by the **anterior pituitary gland (adenohypophysis)**.The **key hormone** produced by the hypothalamus is **gonadotropin-releasing hormone (GnRH)**, also known as **luliberin** or **LHRH**. This hormone, along with its synthetic analogs, stimulates the release of the two primary **gonadotropins**:

- **Luteinizing hormone (LH)**
- **Follicle-stimulating hormone (FSH)**

GnRH is secreted in a pulsatile manner, which is critically important for the **normal functioning of the pituitary gland**.

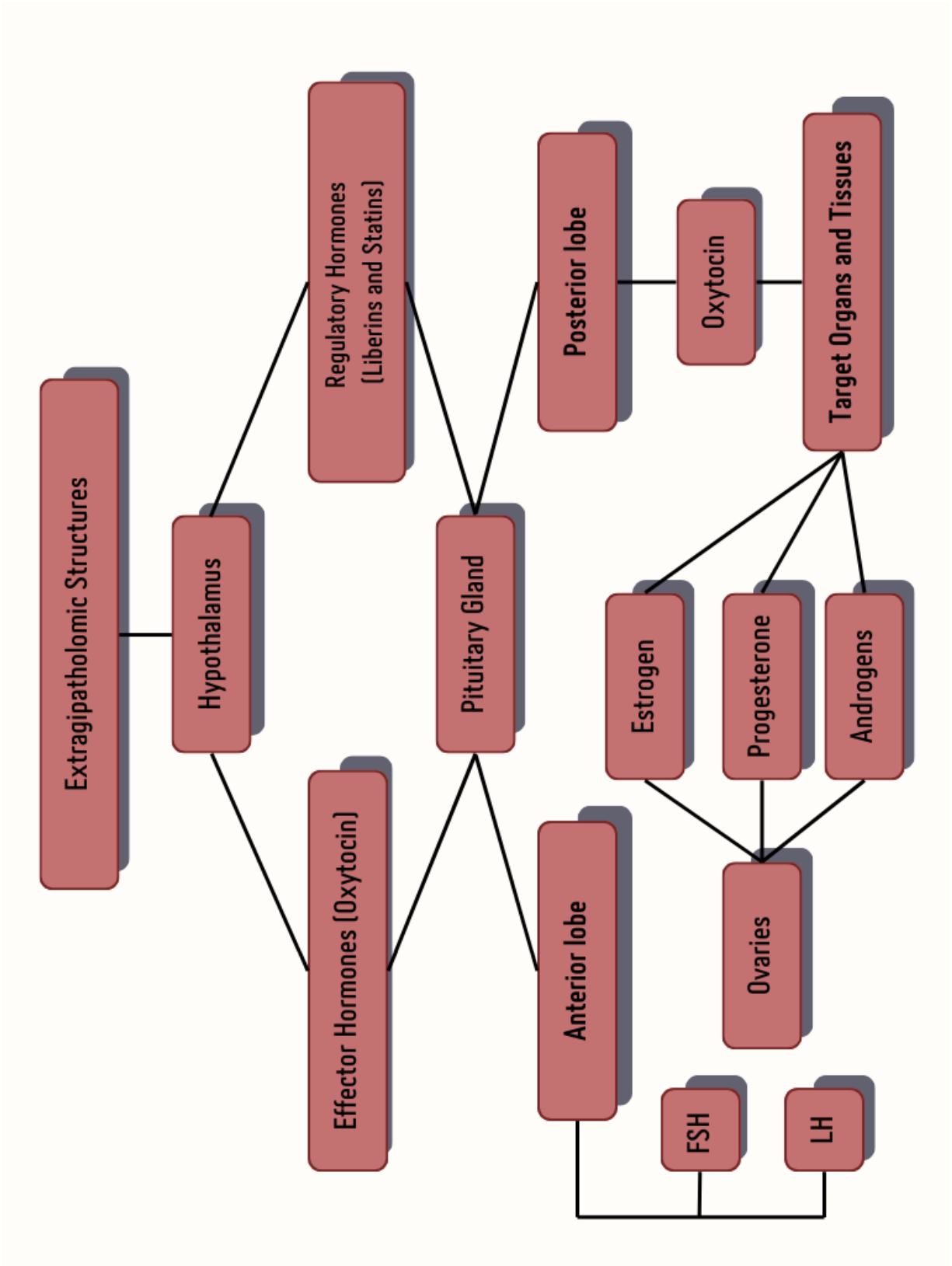

Table 1.2. Functional Structure of the Reproductive System

These **releasing hormones** are transported through the **portal vascular system** of the **hypothalamic-pituitary tract** to the **anterior pituitary (adenohypophysis)**, where they trigger a cascade of hormonal responses.

Thus, the **hypothalamus** coordinates the interaction between the **nervous** and **endocrine systems**, forming the foundation of the complex regulatory mechanism of the menstrual cycle.

III. The Pituitary Gland — Third Level of Regulation

The **pituitary gland**, a key component of the neuroendocrine system, consists of two main parts:

- The **adenohypophysis** (anterior lobe)
- The **neurohypophysis** (posterior lobe)

Menstrual cycle regulation is primarily carried out by **tropic hormones** secreted by the **anterior pituitary**.

Among them, the main **gonadotropic hormones** are:

- **FSH (Follicle-Stimulating Hormone):** stimulates the growth, development, and maturation of ovarian follicles
- **LH (Luteinizing Hormone):** triggers ovulation and promotes the formation of the **corpus luteum**; also essential for estrogen synthesis by the mature follicle
- **PRL (Prolactin):** regulates lactation and the development of mammary glands; together with LH, supports the function of the corpus luteum by stimulating progesterone production

Other **tropic hormones** of the adenohypophysis include:

- **GH (Growth Hormone):** responsible for general physical development
- **ACTH (Adrenocorticotropic Hormone):** regulates adrenal cortex function
- **TSH (Thyroid-Stimulating Hormone):** affects the activity of the thyroid gland

From a physiological standpoint, the **FSH peak** occurs around **day 7** of the menstrual cycle, while the **LH surge** appears around **day 14**, triggering **ovulation** through the rupture of the mature follicle.

IV. The Ovaries — Fourth Level of Regulation

The **ovaries** perform two primary functions:

1. **Generative function** – the maturation of follicles and ovulation
2. **Endocrine function** – the synthesis of **steroid hormones**, mainly **estrogens** and **progesterone**

At birth, a female has up to **500 million primordial follicles** in both ovaries. By the onset of puberty, this number is reduced by approximately half due to the natural process of **atresia**. Throughout the reproductive years, approximately **400 follicles** undergo ovulation.

Ovarian Cycle

The **ovarian cycle** is divided into two phases:

1. **Follicular phase** – begins immediately after menstruation ends and lasts until ovulation.
2. **Luteal phase** – follows ovulation and ends with the onset of the next menstruation if fertilization does not occur.

Starting around the **seventh day** of the menstrual cycle, **multiple follicles** begin to grow simultaneously in the ovary. However, one of them soon outpaces the others in development and reaches a diameter of **20–28 mm** by the time of ovulation. This follicle, characterized by a more developed capillary network, is known as the **dominant follicle**. It contains the **oocyte**, and the cavity is filled with **follicular fluid**.

By the time of **ovulation**, the volume of follicular fluid increases **by a factor of 100**, and the concentration of **estradiol (E_2)** rises sharply. This hormone stimulates a **surge of luteinizing hormone (LH)** from the pituitary gland, which triggers the rupture of the mature follicle—**ovulation**, typically occurring on **day 14** of the cycle.

During ovulation, follicular fluid is released through the ruptured follicle wall, carrying the oocyte along with **cells of the corona radiata**. If the oocyte is not fertilized, it degenerates within **12–24 hours**. After its release, capillaries quickly grow into the follicular cavity, and **granulosa cells** undergo **luteinization**, forming the **corpus luteum**, which begins to produce **progesterone**.

If pregnancy does not occur, the corpus luteum undergoes **involution**, turning into the **corpus albicans**. Its functional activity typically lasts for **10–12 days**, after which regression sets in.

Hormonal Activity of the Ovary

Granulosa cells of the follicle synthesize **estrogens**, including:

- **Estrone (E_1)**
- **Estradiol (E_2)**
- **Estriol (E_3)**

The **corpus luteum** produces **progesterone**, the key hormone of the second phase of the cycle, which:

- Prepares the endometrium for implantation of a fertilized egg
- Supports early pregnancy
- Prepares the mammary glands for lactation
- Suppresses contractile activity of the myometrium
- Has **anabolic effects**
- Causes an increase in **basal (rectal) body temperature** during the luteal phase

In addition, the ovary produces **androgens**, including:

- **Androstenedione** (a testosterone precursor, up to 15 mg/day)
- **Dehydroepiandrosterone (DHEA)**
- **Dehydroepiandrosterone sulfate (DHEA-S)**

Granulosa cells also produce **inhibin** – a protein hormone that suppresses **FSH secretion** by the pituitary gland. Additionally, they synthesize **local-acting protein substances** such as **oxytocin** and **relaxin**. Ovarian oxytocin contributes to **corpus luteum regression**. **Prostaglandins**, synthesized in the ovary, also play a role in ovulation.

V. The Uterus — A Target Organ for Ovarian Hormones

The **uterus** is one of the primary **target organs** responsive to hormones produced by the **ovaries**. Under the influence of **estrogens** and **progesterone**, the **endometrium** undergoes cyclic changes, forming the so-called **uterine (menstrual) cycle**, which includes **four phases**:

1. **Desquamation phase** – shedding of the functional layer of the endometrium, accompanied by bleeding (menstruation).
2. **Regeneration phase** – restoration of the uterine mucosa from the cells of the basal layer.
3. **Proliferation phase** – active growth and thickening of the endometrium, its glands, and blood vessels.
4. **Secretory phase** – functional maturation of the endometrium and its preparation for the possible implantation of a fertilized egg.

The **proliferation phase** begins immediately after the end of menstrual bleeding. Under the influence of **estrogens**, synthesized in the ovaries in response to **FSH**, the functional layer of the endometrium is restored and actively grows. This phase lasts until **day 14** of a 28-day menstrual cycle, ending with ovulation.

The **secretory phase** begins in the **middle of the cycle** and continues until the onset of the next menstruation. It is driven by **progesterone**, produced by the **corpus luteum**. During this period, the endometrium becomes fully prepared for **embryo implantation**.

If **pregnancy does not occur**, the **corpus luteum regresses**, resulting in a drop in **progesterone and estrogen levels**. This causes **hemorrhage**, **necrosis**, and **shedding** of the functional layer of the endometrium — menstruation begins (the **desquamation phase**).

Cyclic changes under the influence of sex hormones occur not only in the endometrium, but also in other **target organs**, including:

- **Fallopian tubes**
- **Vagina**
- **External genitalia**
- **Mammary glands**

- **Hair follicles**
- **Skin**
- **Bones**
- **Adipose tissue**

The **cells of these organs and tissues** possess **specific receptors** for estrogens and progesterone, which ensures their sensitivity to hormonal fluctuations and their involvement in the overall function of the reproductive system.

Questions for the Chapter

I. Multiple-Choice Questions (Single Best Answer)

1. **Which hormone is the primary regulator of ovulation?**
   A) Prolactin
   B) Luteinizing hormone (LH)
   C) Estrogen
   D) Cortisol

2. **In which phase of the menstrual cycle does endometrial growth occur?**
   A) Follicular
   B) Ovulatory
   C) Luteal
   D) Post-ovulatory

3. **What stimulates the secretion of gonadotropin-releasing hormone (GnRH)?**
   A) Low estrogen levels
   B) High progesterone levels
   C) Stable cortisol levels
   D) Prolactin secretion

4. **What is the physiologically normal length of the menstrual cycle?**
   A) 20–25 days
   B) 21–35 days
   C) 28–40 days
   D) 30–45 days

5. **Which ovarian structure produces progesterone during the luteal phase?**
   A) Graafian follicle
   B) Corpus luteum
   C) Theca follicles
   D) Follicular cell

6. **What happens when FSH levels rise at the beginning of the cycle?**
   A) Maturation of the dominant follicle
   B) Inhibition of ovulation
   C) Progesterone production
   D) Endometrial thickening

7. **What changes are observed in basal body temperature during ovulation?**
   A) Decrease
   B) Sharp increase
   C) Gradual increase
   D) No change

8. **What is the main function of estrogens?**
   A) Stabilize progesterone levels
   B) Ensure ovulation
   C) Regulate endometrial growth
   D) Suppress FSH secretion

9. **What does the LH surge stimulate?**
   A) Ovulation
   B) Endometrial resorption
   C) Inhibition of follicle maturation
   D) Prolactin secretion

II. Open-Ended Questions (Extended Response Tasks)

1. Describe the hormonal regulation mechanisms of the menstrual cycle, including the roles of the hypothalamus, pituitary gland, and ovaries.

2. What are the main stages of endometrial changes during the normal menstrual cycle? Explain their functional significance.

3. What changes occur in a woman's body during ovulation? Describe physiological signs and methods of detecting this period.
4. Discuss the roles of FSH and LH in regulating reproductive function. How does their imbalance affect the menstrual cycle?
5. What is the significance of the corpus luteum in the menstrual cycle, and what are the consequences of its insufficiency?

All supplementary self-assessment materials are available in the Telegram channel:

https://t.me/+_H6LveAOXTw1ZmYy

Or scan the QR code:

Chapter №2. Menstrual Cycle Disorders

2.1. Amenorrhea

Amenorrhea is defined as the absence of menstruation for a period of six months or more in women of reproductive age (16 to 45 years).

I. Physiological Amenorrhea

Physiological amenorrhea is a normal condition during the following life periods:

- **Pregnancy**
- **Lactation**
- **Before the onset of puberty**
- **Postmenopause**

II. Pathological Amenorrhea

Pathological amenorrhea is a symptom associated with a wide range of **gynecological** and **extragenital diseases**.

Depending on the presence or absence of **hormonal** and **cyclical processes**, amenorrhea is classified as:

- **True amenorrhea** – complete absence of both menstruation and hormonal cyclic changes in the body.
- **False amenorrhea (cryptomenorrhea)** – hormonal activity and cyclic processes are preserved, but menstrual bleeding is absent due to **anatomical obstructions** (e.g., imperforate hymen, cervical canal or vaginal atresia, or other congenital anomalies).

Amenorrhea is divided into **physiological** and **pathological** forms.

True Amenorrhea

I. Primary Amenorrhea

Primary amenorrhea is the absence of menstruation in girls aged 16 or older **if menarche has never occurred**.

1. **Hypogonadotropic Amenorrhea**
   This type is caused by a **deficiency of gonadotropins** – **luteinizing hormone**

(LH) and **follicle-stimulating hormone (FSH)**, which are secreted by the **anterior pituitary gland (adenohypophysis)**.

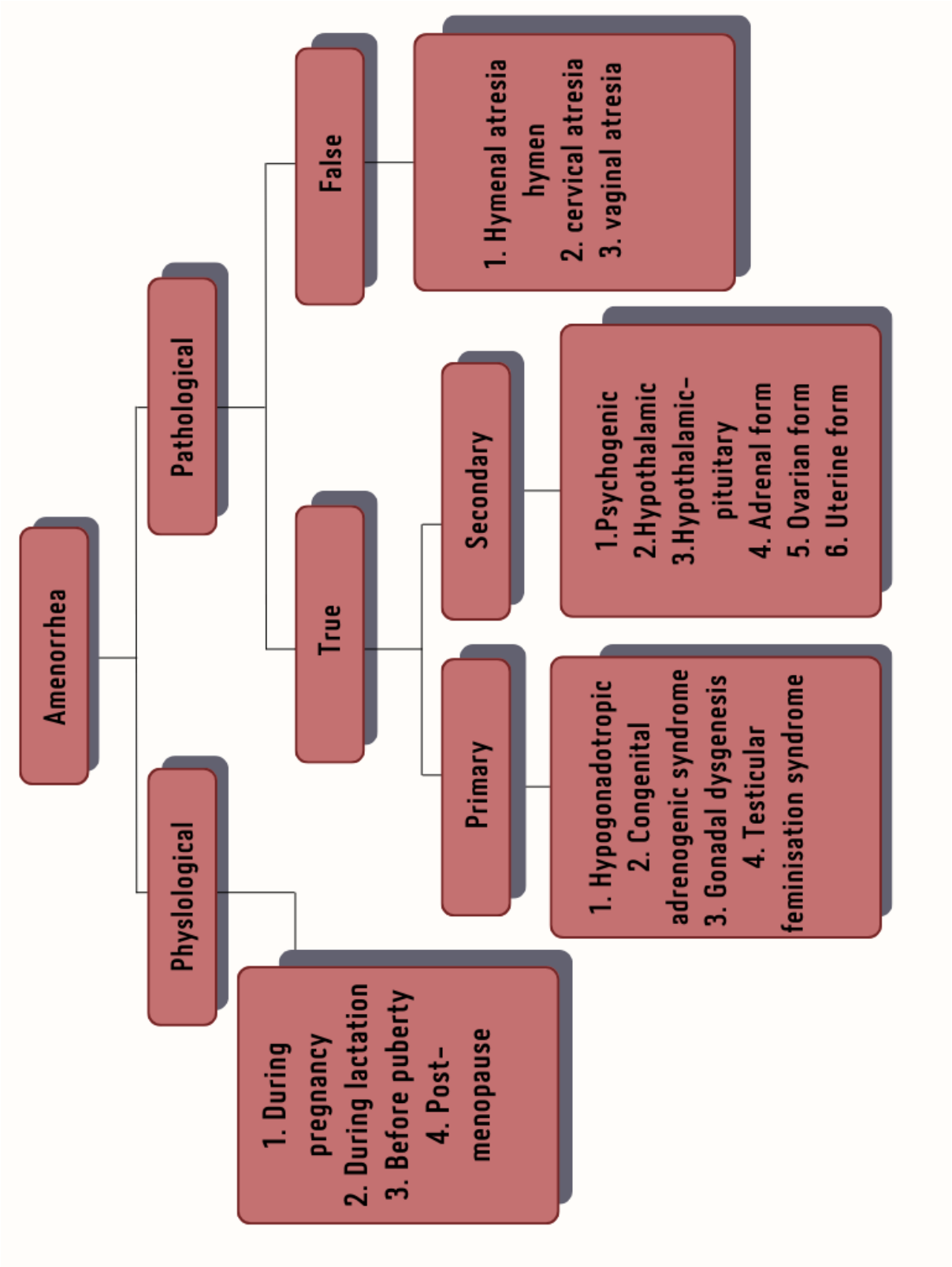

Table 2.1. Classification of Amenorrhea

A deficiency of these hormones leads to **insufficient ovarian stimulation**, resulting in impaired **sex steroid synthesis** and failure to initiate **follicular maturation, ovulation**, and, consequently, the **menstrual cycle**.

Clinical Features:

- **Eunuchoid body proportions:** tall stature, elongated limbs, underdeveloped musculature
- **Hypoplasia of the mammary glands** with predominance of adipose tissue over glandular tissue
- **Underdevelopment of internal genital organs:** uterine and ovarian sizes correspond to prepubertal levels (2–7 years)
- **Absence of menstruation and secondary sexual characteristics**

Treatment:

Therapy aims to **stimulate ovarian function** and **induce pubertal development**. The first stage involves **hormone therapy** with **gonadotropin preparations** (typically LH and FSH) to initiate **follicular growth** and **estrogen production**. Once secondary sexual characteristics begin to form, treatment proceeds to **cyclic hormone replacement therapy** using **combined oral contraceptives** for **3–4 months or longer** to maintain a **regular menstrual cycle**.

The goal of treatment is not only to **induce menstruation**, but also to ensure **normal sexual development** and, if desired, **restore fertility** in the future.

2. Primary Amenorrhea with Signs of Virilization

This form of amenorrhea develops in **congenital adrenal hyperplasia (CAH)** — a hereditary disorder caused by **genetically determined enzyme defects** in the **adrenal cortex**, most commonly involving **21-hydroxylase deficiency**. Disruption of the enzymatic pathway for corticosteroid synthesis leads to the **accumulation of androgens**, resulting in **masculinization** of the body. CAH is characterized by **androgen overproduction**, with **reduced synthesis of glucocorticoids**, and, in some cases, **mineralocorticoids**.

Clinical Presentation:

- **Primary amenorrhea** (menstruation has never occurred)

- **Signs of virilization:** clitoromegaly, deepened voice, increased muscle mass in a male pattern
- **Male-pattern hair growth:** pubic and axillary hair, early onset of facial hair, acne
- **Underdevelopment of the breasts**
- **Possible electrolyte imbalances** in the salt-wasting form (e.g., **hyponatremia**, **hyperkalemia**)

Treatment:

- The cornerstone of therapy is **long-term glucocorticoid replacement therapy**, which reduces **androgen production**.
- In cases of pronounced **virilization of external genitalia** in childhood, **plastic surgical correction** may be performed.
- In adolescence and reproductive age, treatment aims to **normalize hormonal balance**, **restore the menstrual cycle**, and **preserve or achieve fertility** (if necessary, using **assisted reproductive technologies**).

3. Primary Amenorrhea with a Normal Female Phenotype

This type of amenorrhea occurs in patients with an **externally typical female body habitus**, but with **abnormal development of internal genital organs**. The most common causes include **congenital agenesis or aplasia of the uterus and vagina**, as well as the rare **testicular feminization syndrome** (also known as **complete androgen insensitivity syndrome**).

Testicular feminization syndrome (complete androgen insensitivity syndrome) is a **monogenic disorder** caused by a **mutation** that disrupts tissue response to androgens. It occurs with a frequency of approximately **1 in 12,000–15,000** male newborns.

Clinical Features:

- **Karyotype**: 46, XY
- **External genitalia** are **female in appearance**
- **Vagina** is **shortened and ends blindly**

- **Gonads (testes)** may be located in the **abdominal cavity**, **inguinal canals**, or **labia majora**
- **Unilateral inguinal hernia** is often detected, containing a testis
- **Breasts** are developed, but **nipples and areolae** are **hypoplastic**
- **Pubic and axillary hair** is **absent**, due to androgen insensitivity

Despite their **female phenotype**, these patients lack a **uterus** and **functional ovaries**, making menstruation and pregnancy **impossible**.

Treatment:

- **Surgical removal of the gonads (testes)** is indicated to **prevent malignancy**. The procedure is usually performed **after the development of secondary sexual characteristics**, typically at **age 16–18**.
- **Plastic reconstruction of the vagina** may be performed later if needed.

4. Gonadal Dysgenesis

Gonadal dysgenesis is a congenital anomaly caused by **quantitative or qualitative abnormalities of the sex chromosomes**. As a result of these genetic defects, **normal ovarian tissue fails to form**; instead, **fibrous streaks** develop in place of functional gonads, which are incapable of hormonal activity. This leads to a **severe deficiency of sex steroids** and, consequently, **disrupted sexual development**.

There are **three clinical forms** of gonadal dysgenesis:

1. Turner Syndrome (Shereshevsky–Turner Syndrome)

This is the most extensively studied form of gonadal dysgenesis. Characteristic karyotypes include:

- **45,X**
- **45,X/46,XY**
- **45,X/47,XXX**

Sex chromatin is either absent or significantly reduced. Blood tests typically reveal **markedly decreased levels of ovarian hormones** and **elevated levels of gonadotropins**.

Clinical Features:

- Low birth weight
- Webbed neck (lateral cervical skin folds)
- Congenital heart, vascular, and renal anomalies
- Significant growth retardation
- Skeletal deformities, osteoporosis
- Low-set ears
- High-arched palate
- Low posterior hairline
- Valgus deformity of elbows and knees
- Syndactyly
- Absence of secondary sexual characteristics (breast development, pubic hair, etc.)

2. Pure Gonadal Dysgenesis

Patients have a **female phenotype** and usually **normal or tall stature**. However, there is **absent or underdeveloped breast tissue**, **sparse pubic and axillary hair**, and **underdeveloped internal and external genitalia**.

Genetic Features:

- Karyotype: **46,XX** or **46,XY**
- Sex chromatin: **Negative**
- Gonads: Represented by **fibrous streaks**

3. Mixed Gonadal Dysgenesis

This form is typically **not associated with major somatic abnormalities**, but **signs of virilization** are present (e.g., clitoromegaly, male-pattern body features).

Most commonly associated with **mosaic karyotypes**, such as:

- **45,X/46,XY**
- Other mosaic variations

Sex chromatin is negative. Histologically, one side may have a **fibrous streak gonad**, while the other may show a **dysgenetic testis**.

Treatment:

Therapeutic strategy depends on the form of gonadal dysgenesis:

- At **13–14 years of age**, **estrogen replacement therapy** is initiated and continued until **breast development** and **menstrual-like bleeding** occur.
- Subsequently, **combined oral contraceptives** are prescribed **long-term** to maintain hormonal levels during reproductive age.
- In **mixed gonadal dysgenesis**, **surgical removal of the gonads** is mandatory due to the **high risk of malignancy**.

II. Secondary Amenorrhea

Secondary amenorrhea is defined as the **cessation of menstruation for more than six months** in women who previously had regular menstrual cycles. This condition may result from either **functional** or **organic disorders** at various levels of the **neuroendocrine regulatory system**.

1. Psychogenic Amenorrhea (Stress-Induced Amenorrhea)

This form of amenorrhea develops as a result of **psycho-emotional stress**, either acute or chronic, which disrupts the activity of higher centers of the **central nervous system**, particularly the **cerebral cortex**.

Under stress, there is a **massive release** of **adrenocorticotropic hormone (ACTH)**, **endorphins**, and **neurotransmitters** into the bloodstream. This leads to **suppression of GnRH (gonadotropin-releasing hormone)** production in the hypothalamus, as well as reduced secretion of **FSH** and **LH** by the pituitary gland.

Clinical Manifestations:

- Absence of menstruation
- Symptoms of **astheno-neurotic**, **astheno-depressive**, or **astheno-hypochondriacal syndromes** (e.g., fatigue, anxiety, tearfulness, insomnia, low mood)

Treatment Includes:

- **Psychotherapy**

- If necessary, use of **antidepressants** or **neuroleptics**
- **General restorative therapy** (vitamins B, A, and E)
- **Homeopathic** and **adaptogenic** remedies (based on individual indications)

2. Hypothalamic Amenorrhea

This type is associated with **dysfunction of the hypothalamus**, which plays a central role in menstrual cycle regulation. Several clinical variants are distinguished:

a) Amenorrhea due to body weight deficiency

Common among girls following **strict diets** with insufficient protein, fat, and caloric intake. Rapid weight loss leads to decreased **leptin synthesis** and disrupted **energy balance**, which suppresses **hypothalamic-pituitary activity**.

b) Amenorrhea in anorexia nervosa

Occurs in adolescent girls and young women, especially those with **emotional instability**. Often associated with **distorted body image** and a **pathological desire to lose weight**. Amenorrhea is one of the **diagnostic criteria** for anorexia nervosa.

c) Amenorrhea in pseudopregnancy

A rare **psychosomatic condition** in which a woman who strongly desires to conceive develops signs of pregnancy (breast engorgement, nausea, abdominal distension) **in the absence of actual pregnancy**. Secondary amenorrhea may develop in this context.

Treatment of Hypothalamic Amenorrhea Is Aimed At Eliminating the Underlying Cause:

- **Psychotherapy**
- **Nutritional rehabilitation** with increased caloric intake
- If necessary, **cyclic hormone therapy** to restore menstrual function
- In pseudopregnancy: **sedative medications**

In most cases, menstruation **resumes spontaneously** within **1–3 months** after **emotional stress is relieved**.

3. Hypothalamic-Pituitary Amenorrhea

This type of amenorrhea is associated with dysfunction of the **hypothalamic-pituitary system**, which regulates the secretion of **gonadotropins** and **prolactin**. Two main forms are distinguished: **hyperprolactinemia** and **congenital hypogonadotropic amenorrhea**.

1. Hyperprolactinemia

Hyperprolactinemia is an elevated level of **prolactin** in the blood due to its **excessive secretion by the pituitary gland**. It may be classified as:

- **Physiological hyperprolactinemia** – occurs during **pregnancy and lactation**
- **Pathological hyperprolactinemia**, which can be:
  - **Functional** – caused by reversible regulatory disorders
  - **Organic** – caused by structural changes such as **prolactinomas**

Functional hyperprolactinemia may develop in the following conditions:

- **Hypothyroidism**
- **Prolonged use** of psychotropic drugs, neuroleptics, or hormonal medications
- **Use of combined oral contraceptives**
- **Chronic stress**
- **Certain forms of hyperandrogenism**
- **Post-lactation period**
- **Post-abortion states**

Clinical Presentation:

- **Secondary amenorrhea**
- **Spontaneous galactorrhea**
- **Infertility**
- **Decreased libido**
- **Moderate uterine hypoplasia**, possible breast tenderness

Organic Hyperprolactinemia

This form occurs in the presence of a **prolactinoma** — a benign **pituitary adenoma** that secretes prolactin. Its main manifestations include the **amenorrhea-galactorrhea syndrome** and **infertility**.

Several clinical syndromes are described:

- **Chiari–Frommel syndrome** – amenorrhea and galactorrhea after childbirth
- **Argonz–del Castillo syndrome** – idiopathic form with unknown etiology
- **Forbes–Albright syndrome** – tumor-related hyperprolactinemia

Treatment:

- **Surgical intervention** (neurosurgery) for large pituitary adenomas
- **Pharmacologic therapy** for functional disorders:
    - **Bromocriptine (Parlodel)**
    - **Cabergoline (Dostinex)**
- **Thyroid hormone replacement** in cases of hypothyroidism

2. Hypogonadotropic Amenorrhea

This is a **congenital form of hypothalamic-pituitary insufficiency**, diagnosed in approximately **15–20% of women** with amenorrhea.

Typical Findings:

- **Low levels** of **gonadotropins (FSH and LH)**
- **Reduced estradiol concentrations**
- **Normal levels** of **prolactin, testosterone, and cortisol**

Treatment:

To **restore menstruation-like bleeding**, **combined oral contraceptives** are used. These not only induce **secondary sexual characteristics**, but also help **stabilize hormonal balance**.

Other Forms of Secondary Amenorrhea

3. Postpartum Hypopituitarism (Sheehan's Syndrome)

This syndrome develops due to **ischemic necrosis of the pituitary gland**, occurring after **massive postpartum hemorrhage**. The synthesis of **pituitary tropic hormones**, including **gonadotropins**, is impaired, resulting in **secondary amenorrhea**.

Clinical manifestations may include:

- **Galactorrhea**
- **Loss of libido**
- **Weakness**
- **Hypotension**
- **Dry skin**
- **Hair loss**
- **Lack of lactation** after childbirth

4. Amenorrhea in Acromegaly and Gigantism

Caused by **excess secretion of growth hormone (GH)** due to a **pituitary adenoma**.

- If the condition occurs **before puberty**, **gigantism** develops (disproportionate excessive growth)
- If it arises **after growth completion**, **acromegaly** develops, characterized by **thickening of the hands, feet, and facial features**

Treatment:

- Administration of **high doses of estrogens** to suppress excessive growth
- To restore the menstrual cycle, **combined oral contraceptives (COCs)** are prescribed for **3–4 months**

5. Amenorrhea in Cushing's Disease

Occurs due to **excessive secretion of ACTH (adrenocorticotropic hormone)**, which may result from a **basophilic pituitary adenoma**, **traumatic brain injury**, or **encephalitis**.

Clinical signs:

- **Obesity** with characteristic fat redistribution: **moon-shaped face with a purplish-red hue**, fat accumulation in the **neck, upper torso, and abdomen** with **slim limbs**
- Possible signs of **hyperandrogenism** and **menstrual irregularities**

Treatment:

- **Estrogen-progestin medications** (COCs) in a **21-day regimen**, administered for **4–5 months** to normalize hormone levels and restore the cycle

6. Adrenal Form of Amenorrhea

May be caused by:

- **Postpubertal congenital adrenal hyperplasia (CAH)** — due to a **congenital enzymatic defect** in the adrenal cortex, leading to **androgen overproduction** and **virilization**
- **Virilizing adrenal tumors** that produce androgens

Treatment:

- **Medical management** in cases of adrenal hyperplasia
- **Surgical treatment** in cases of tumors

7. Ovarian Forms of Amenorrhea

a) Ovarian Failure Syndrome (Premature Menopause)
Occurs in women under the age of 38. Characterized by **secondary amenorrhea**, **hypoestrogenism**, and **infertility**.

Treatment:

- **Cyclic hormone replacement therapy (HRT)** with **low-dose estrogen-progestin preparations**
- Use of **low-estrogen COCs**

b) Resistant Ovary Syndrome
A condition where the **ovaries maintain normal morphology**, but are **unresponsive to gonadotropin stimulation**.

Clinical manifestations:

- **Secondary amenorrhea**
- **Infertility**
- **Normal levels** of **FSH and LH**, but **no response** to exogenous administration

Treatment:

- **Long-term estrogen-progestin hormone therapy**
- Often, **very low doses** are used (0.5 or 0.25 tablet per day) with **estrogen content not exceeding 0.03 mg**, as part of **combined oral contraceptives**

8. Uterine Form of Amenorrhea

The **uterine form of amenorrhea** develops as a result of **pathological changes in the endometrium**, which prevent its **normal function and regeneration**. The menstrual cycle remains hormonally active, but **shedding of the functional layer** and **menstrual bleeding** do not occur.

One of the most common causes is **Asherman's syndrome** — a condition characterized by the formation of **intrauterine adhesions (synechiae)** that interfere with **endometrial shedding and/or regeneration**.

Treatment:

- **Surgical removal of intrauterine synechiae**, typically performed via **hysteroscopy with curettage**
- **Subsequent cyclic hormone therapy** to stimulate endometrial recovery
- **Homeopathic remedies** may be used as **supportive therapy** (based on individual indications)

Cryptomenorrhea (False Amenorrhea)

Cryptomenorrhea is a form of **false amenorrhea**, in which **hormonal and cyclical ovarian activity is preserved**, but **menstrual blood cannot exit** through the genital tract.

As a result, blood may accumulate in the **uterine cavity (hematometra)**, the **vagina (hematocolpos)**, or even the **pelvic cavity** due to **retrograde flow**, often accompanied by **pelvic pain**.

Causes:

- **Imperforate hymen**
- **Cervical canal atresia**
- **Vaginal atresia**
- Other **congenital malformations** of the genital tract

Treatment:

- **Surgical intervention only**, aimed at **restoring patency** of the genital tract and **ensuring normal menstrual blood outflow**

2.2. Hypomenstrual Syndrome

Hypomenstrual syndrome is a menstrual cycle disorder characterized by **weak or diminished menstruation**. In clinical practice, this term encompasses conditions associated with a **reduced volume and/or duration** of menstrual bleeding, as well as **increased intervals between menstrual cycles**.

The main forms of hypomenstrual syndrome include:

- **Hypomenorrhea** – a reduction in menstrual blood volume to **25 ml or less**
- **Oligomenorrhea** – a decrease in the **duration of menstruation** to **two days or fewer**
- **Opsomenorrhea (Bradymenorrhea)** – **delayed menstruation**, with **cycle intervals of 5 to 8 weeks**
- **Spaniomenorrhea** – **extremely infrequent menstruation**, occurring **only 2–4 times per year**

Mixed forms of hypomenstrual syndrome are frequently observed, such as **hypo- and oligomenorrhea**, **hypo- and opsomenorrhea**, etc. In some patients, these conditions serve as precursors to **amenorrhea**.

Classification by Onset:

- **Primary hypomenstrual syndrome** – menstruation is weak **from the very beginning**; often seen in cases of **developmental abnormalities**, **hypoplasia**, or **infantilism**
- **Secondary hypomenstrual syndrome** – develops **after a period of normal menstrual cycles**, usually associated with **endocrine disorders**, **chronic diseases**, or **trauma to the reproductive organs**

Etiology and Pathogenesis:

Factors contributing to the development of hypomenstrual syndrome include:

- General exhaustion of the body, poor living conditions
- Chronic infections, intoxications
- Diseases of the endocrine glands
- Tuberculosis or inflammatory processes in the pelvic organs
- Surgical procedures on the uterus (e.g., curettage, defundation)
- Genital hypoplasia, reduced endometrial receptivity
- Dysfunction in the **CNS–pituitary–ovary** regulatory axis

Clinical Forms and Menstrual Cycle Features:

- In **hypomenorrhea**, menstruation may appear only as **spots or drops of blood**. The cycle may remain **biphasic**, sometimes with a **normal luteal phase**
- **Oligomenorrhea** often accompanies hypomenorrhea and may precede **amenorrhea**
- **Opsomenorrhea** has several variants:

1. A cycle with a **prolonged follicular phase** and a **normal luteal phase**; ovulation occurs between **days 17 and 30**, due to **delayed follicle maturation** and **suppressed FSH secretion**
2. A cycle with a **shortened luteal phase** and **late ovulation**; leads to **luteal phase deficiency** and possibly **glandular-cystic endometrial hyperplasia**
3. A cycle with a **prolonged luteal phase** and **normal follicular phase** – a rare variant

Diagnosis

The diagnosis of **hypomenstrual syndrome** is established based on:

- **Medical history**
- **General and gynecological examination**
- **Laboratory tests** (hormonal profile)

- **Functional assessments** (basal body temperature, pelvic ultrasound, etc.)

Treatment

Therapeutic strategy depends on the **cause and severity** of the disorder. It may include:

- **General health-supportive measures**
- **Physiotherapy** to improve **pelvic organ blood circulation**
- **Hormone therapy** (cyclic, if necessary)
- **Immunostimulants** – based on individual indications

2.3. Delayed Sexual and Functional Development in Girls and Young Women

Delayed sexual development (DSD) is a condition in which **girls aged 15–16** show **no menstruation** and **lack secondary sexual characteristics** (breast development, pubic and axillary hair). It may result from **disrupted coordination of various components** of the **neuroendocrine system** responsible for **puberty regulation**.

Delay may present as a **complete absence of all secondary sexual characteristics** or as **isolated absence of menarche** while other signs of puberty are present.

Classification of DSD Based on the Level of Reproductive System Dysfunction

a) Central Origin of Underdeveloped Sexual Function

1. Hypothalamic Origin

Associated with **hypothalamic damage** due to **tumors**, **inflammation**, or **neuroendocrine dysfunctions**.

- **Without obesity**:
  Girls typically show **growth retardation**, may present with **somatic abnormalities** and **neurological symptoms** (hemiplegia, fundus changes, vision disturbances). Levels of **gonadotropins**, **estrogens**, and **17-ketosteroids** are significantly decreased. **Timely diagnosis and treatment** of the underlying cause are essential.
- **With obesity**:
  Characterized by **normal or accelerated somatic development** (long limbs, wide pelvis, developed musculature) but **lack of body hair**, **smooth skin**, and

normal cognitive development. This condition is described as **Pehrantze–Babinski–Fröhlich syndrome**.

2. Pituitary Origin

Due to **gonadotropin deficiency** as part of **pituitary insufficiency**.

- Presents with **hypoplasia of the mammary glands**, **amenorrhea** (or infrequent anovulatory bleeding)
- In cases of **transient pituitary eunuchoidism** (e.g., due to **nervous anorexia**), secondary sexual characteristics may already be developed, but **menstrual function is impaired**. Symptoms include **sudden weight loss** and **loss of pubic and axillary hair**. Often associated with **psychoemotional stress**.

Treatment aims to eliminate **triggering factors** and restore **hormonal regulation**.

b) Idiopathic Delayed Sexual Development

Associated with **constitutional**, **hereditary**, or **severe somatic diseases** negatively affecting general health.

If **secondary sexual characteristics** have **not developed by the age of 13–15**, thorough diagnostics are required, including:

- **Anthropometric measurements**
- **Assessment of ovarian and adrenal hormone levels**
- **Radiographic evaluation of bone age**
- **Examination of the endocrine and other body systems**

If **no organic abnormalities** are identified, **hormone therapy** is administered using **chorionic gonadotropin** or **sex steroids**. Additionally, **general supportive treatment** and **elimination of external adverse factors** are recommended.

c) Peripheral (Ovarian) Origin of Sexual Underdevelopment

This form of **delayed sexual development (DSD)** is caused by **destructive changes in the ovaries** or **gonadal dysgenesis**, most often **congenital** and associated with **sex chromosome abnormalities**.

Gonadal forms of DSD include:

- **Typical gonadal dysgenesis – Turner syndrome (45,X)**
- **Pure form – Swyer syndrome (46,XY)**
- **Mixed form** – with **mosaicism** or **partial karyotype abnormalities**

In all these forms, the following are observed:

- **Severe hypoestrogenism**
- **Absence of menstruation (amenorrhea)**
- **Underdevelopment of internal and external genitalia**
- **Infertility** is frequently present

Questions for the Chapter

I. Multiple-Choice Questions (Single Best Answer)

1. **What is considered primary amenorrhea?**
   A) Absence of menstruation for 3 months
   B) Absence of menstruation by age 16 with no secondary sexual characteristics
   C) Menstrual cycles longer than 35 days
   D) Acyclical uterine bleeding

2. **Which of the following causes is related to hypergonadotropic amenorrhea?**
   A) Deficiency of GnRH secretion
   B) Polycystic ovary syndrome
   C) Ovarian failure syndrome
   D) Asherman's syndrome

3. **What does a lack of fat tissue in adolescents lead to?**
   A) Hypergonadism
   B) Hypogonadotropic amenorrhea
   C) Hyperestrogenism
   D) Accelerated puberty

4. **Which condition is classified as false amenorrhea?**
   A) Asherman's syndrome
   B) Gonadal dysgenesis

C) Vaginal atresia
D) Kallmann syndrome

5. **What is the classification of delayed sexual development?**
   A) Organic, functional, hormonal
   B) Central, peripheral, somatogenic origin
   C) Primary and secondary
   D) True and false

6. **Which genetic syndrome is characterized by anosmia and secondary amenorrhea?**
   A) Kallmann syndrome
   B) Asherman's syndrome
   C) Turner syndrome
   D) Laurence–Moon–Bardet–Biedl syndrome

7. **Which of the following is NOT a manifestation of hypomenstrual syndrome?**
   A) Oligomenorrhea
   B) Menorrhagia
   C) Hypomenorrhea
   D) Opsomenorrhea

8. **Which syndrome involves congenital hypoplasia of the pituitary gland?**
   A) Asherman's syndrome
   B) Laurence–Moon–Bardet–Biedl syndrome
   C) Sheehan's syndrome
   D) Empty sella syndrome

9. **Which condition is associated with delayed growth and underdevelopment of secondary sexual characteristics?**
   A) Anorexia nervosa
   B) Asherman's syndrome
   C) Obesity
   D) Hyperestrogenism

II. Open-Ended Questions (Extended Response Tasks)

1. Describe the differences between primary and secondary amenorrhea. Provide examples of causes for each type.

2. Explain the mechanisms behind hypomenstrual syndrome and its main clinical features.
3. What are the causes and pathogenesis of delayed sexual development? How are these conditions classified?
4. Discuss the diagnosis and treatment of Asherman's syndrome. What imaging techniques are used?
5. Explain how stress can cause hypogonadotropic amenorrhea.

III. Case-Based Clinical Scenarios

Case №1

A 16-year-old girl complains of absent menstruation. On examination: height 152 cm, weight 38 kg, underdeveloped breasts, no pubic or axillary hair. Ultrasound reveals hypoplastic uterus and ovaries.

Questions:

1. What tests will help determine the cause of amenorrhea?
2. What is the most likely diagnosis?
3. What treatment strategy should be chosen?

Case №2

A 32-year-old woman with a previously regular cycle complains of absent menstruation for 8 months. History includes uterine curettage after miscarriage. Ultrasound reveals thin endometrium and intrauterine adhesions.

Questions:

1. What diagnostic methods can confirm the diagnosis?
2. What complications may arise from this condition?
3. What treatment methods are appropriate?

Case №3

A 14-year-old girl complains of no menstruation. On exam: normal growth and body type, well-developed secondary sexual characteristics. Ultrasound shows presence of the uterus, but vaginal obstruction.

Questions:

1. What is the most likely diagnosis?
2. What diagnostic and treatment methods should be used?
3. What long-term recommendations should be given to the patient?

All supplementary self-assessment materials are available in the Telegram channel:

https://t.me/+_H6LveAOXTw1ZmYy

Or scan the QR code:

Chapter №3. Abnormal Uterine Bleeding (AUB)

Abnormal uterine bleeding (AUB) refers to **bleeding from the genital tract** that differs from normal menstruation in **frequency, duration, volume**, or **timing**. The most common causes are **hormonal imbalances**, resulting from the **disruption of the hypothalamic–pituitary–ovarian (HPO) axis**.

Etiology and Pathogenesis

The establishment of the **menstrual cycle** in adolescent girls is linked to the **gradual development of rhythmic gonadotropin-releasing hormone (GnRH)** secretion by the **hypothalamus**. In **pre-menarcheal** girls, GnRH secretion is absent or minimal. Over time, the frequency and amplitude of **pulsatile GnRH release** increase, leading to the stimulation of **pituitary gonadotropins** — **FSH** and **LH**, which are essential for a complete ovarian cycle: **follicular development**, **ovulation**, and **corpus luteum formation**.

In the **early stages of puberty**, gonadotropin levels may be insufficient — initially for **menarche onset**, and later for establishing **regular ovulation** and a **stable luteal phase**. This may result in **secondary menstrual disorders** such as **anovulation**, **luteal phase deficiency**, **hypomenorrhea**, **oligomenorrhea**, or **amenorrhea**, which can manifest as **dysfunctional uterine bleeding (DUB)** — the most common form of AUB.

Gonadotropin Secretion and Feedback Regulation

Gonadotropin secretion is regulated through a **feedback mechanism** with ovarian sex steroids:

- **Negative feedback**: Low **estradiol** levels at the beginning of the cycle stimulate **FSH** secretion
- **Positive feedback**: High **estradiol** levels in the **pre-ovulatory follicle** trigger a **surge in LH and FSH**, leading to **ovulation**

Key Hormonal Functions

FSH (Follicle-Stimulating Hormone):

- Stimulates **follicular growth and maturation**
- Promotes **granulosa cell proliferation**
- Induces synthesis of **aromatase enzymes** and **LH receptors**

LH (Luteinizing Hormone):

- Stimulates **androgen synthesis** in **theca cells**
- Promotes **estradiol production** in the **dominant follicle**
- Triggers **ovulation**
- Induces **luteinization of granulosa cells** and **progesterone production**

Ovulation occurs approximately **10–12 hours after the LH peak**, or **24–36 hours after the estradiol peak**. Following ovulation, the **corpus luteum** forms, reaching full functional maturity by **day 7**, producing **progesterone and estradiol**.

During the **luteal phase**, **progesterone levels increase tenfold**, preparing the **endometrium** for potential **blastocyst implantation**.

Sex Hormone–Binding Globulin (SHBG) Regulation

The synthesis of **sex hormone–binding globulin (SHBG)** is regulated by **insulin**, **testosterone**, and **estradiol**. Imbalances in these hormones can affect the distribution of **biologically active hormone fractions**, which play a critical role in cyclic endometrial changes.

Immunological assays for **free (unbound) hormone levels** are used to evaluate **reproductive dysfunction**, especially in suspected cases of **dysfunctional AUB**.

Classification of Abnormal Uterine Bleeding (AUB)

According to current **FIGO guidelines**, **abnormal uterine bleeding (AUB)** is classified based on **etiology** using the **PALM–COEIN system** (see Fig. 3.1).

Structural Causes (PALM):

- **P (Polyp)** – Endometrial polyps
- **A (Adenomyosis)** – Adenomyosis
- **L (Leiomyoma)** – Uterine leiomyoma (submucosal or other types)
- **M (Malignancy and hyperplasia)** – Endometrial malignancy and hyperplasia

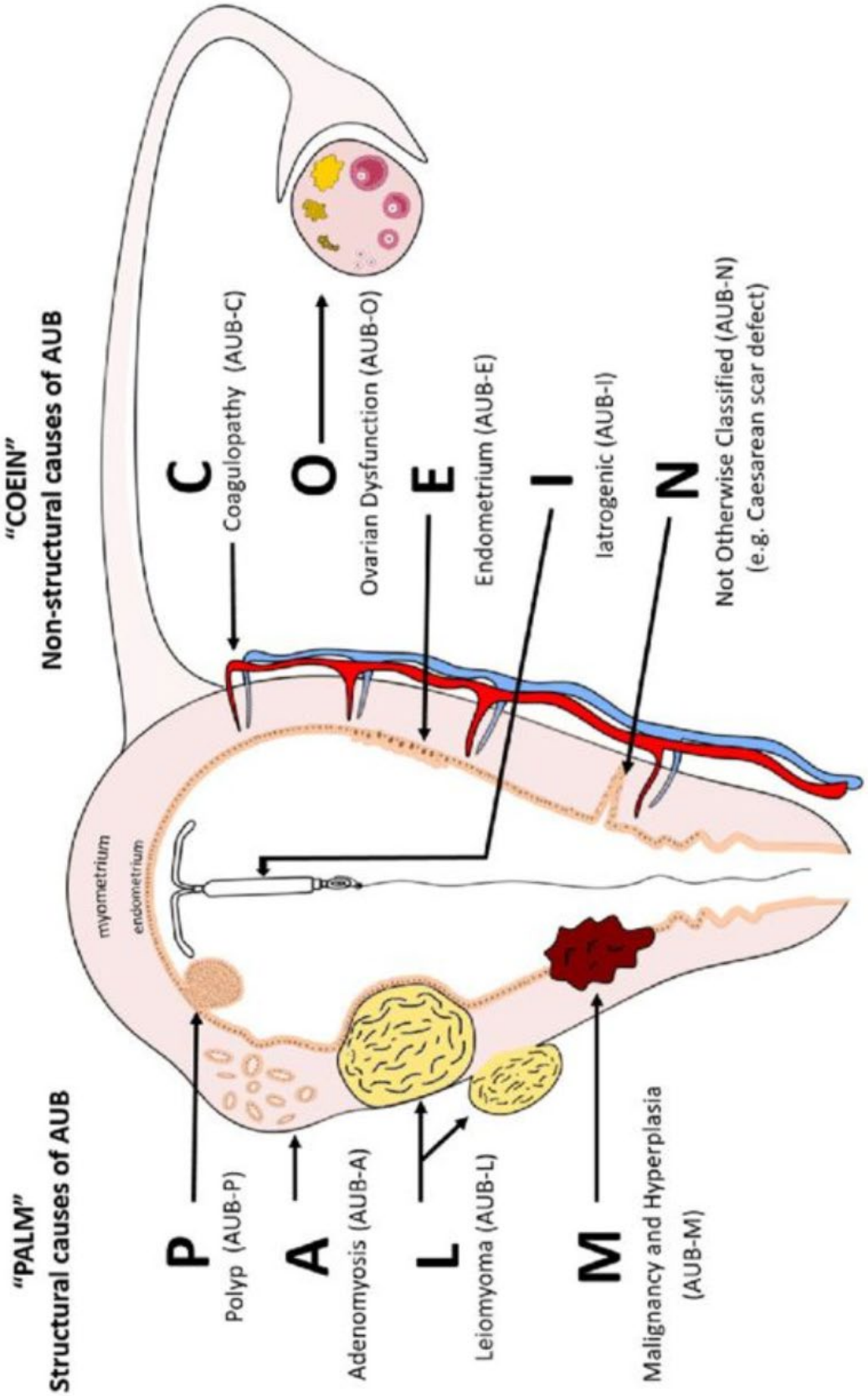

Figure 3.1. PALM–COEIN Classification of Abnormal Uterine Bleeding

Non-Structural/Functional Causes (COEIN):

- **C (Coagulopathy)** – Disorders of blood coagulation
- **O (Ovulatory dysfunction)** – Ovulatory disorders
- **E (Endometrial)** – Primary disorders of the endometrium
- **I (Iatrogenic)** – Caused by medications or medical interventions
- **N (Not yet classified)** – Unclassified causes

Clinical Forms of AUB

Abnormal uterine bleeding (AUB) refers to **any deviation in the volume, duration, frequency, or pattern** of menstrual bleeding in a **non-pregnant woman**. A unified terminology is recommended for describing AUB, and **outdated diagnostic terms should be avoided**. Below are traditional terms that should be **replaced** with the appropriate AUB terminology:

- **Menorrhagia** – heavy and prolonged uterine bleeding during menstruation (cyclical bleeding).
- **Metrorrhagia** – uterine bleeding occurring between menstrual periods (acyclical bleeding).
- **Menometrorrhagia** – a combination of cyclical and acyclical uterine bleeding.
- **Hypermenorrhea** – excessively heavy menstrual bleeding (more than 80 ml).
- **Hypomenorrhea** – very scanty menstrual bleeding (less than 5 ml).
- **Opsomenorrhea** – infrequent menstruation with intervals longer than 38 days.
- **Proiomenorrhea** – frequent menstruation with intervals shorter than 24 days.
- **Polymenorrhea** – uterine bleeding lasting more than 8 days.
- **Oligomenorrhea** – uterine bleeding lasting less than 2 days.
- **Dysfunctional uterine bleeding** – abnormal uterine bleeding caused by hormonal imbalance due to dysfunction of the endocrine glands.

Clinical Features of AUB by Age Group

The clinical presentation and pathogenesis of **abnormal uterine bleeding (AUB)** vary depending on **age group**. Factors considered include the **hormonal profile**, **ovarian reserve**, the **presence or absence of ovulation**, and the **likelihood of organic pathology**.

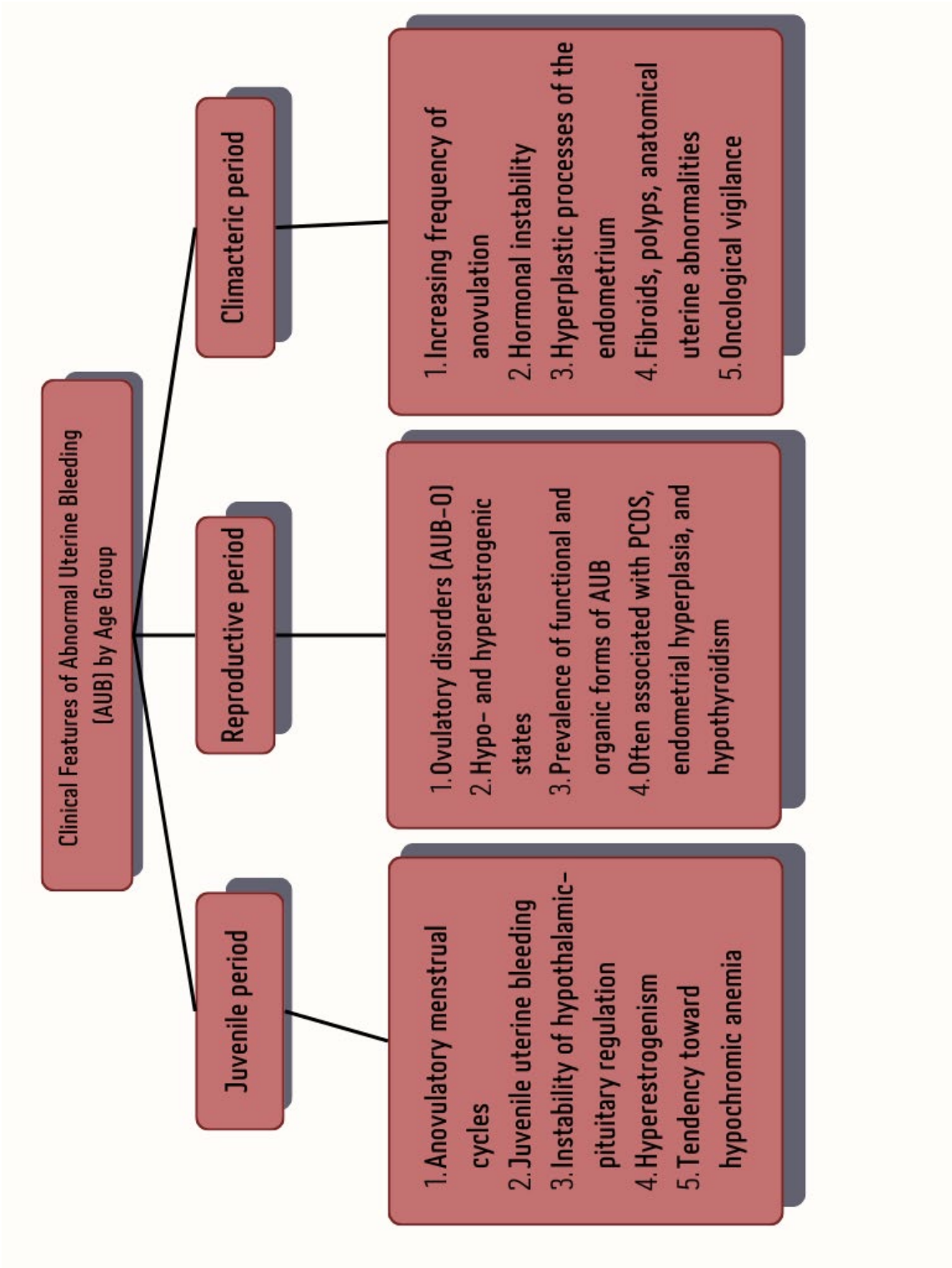

Table 3.2. Clinical Features of AUB by Age Group

Clinical Forms of AUB-O (Ovulatory Dysfunction)

According to **FIGO**, all **hormonally mediated bleeding** in the **absence of structural pathology** is classified as **AUB-O (ovulatory dysfunction)**. These forms are categorized based on the **type of ovulatory disturbance**:

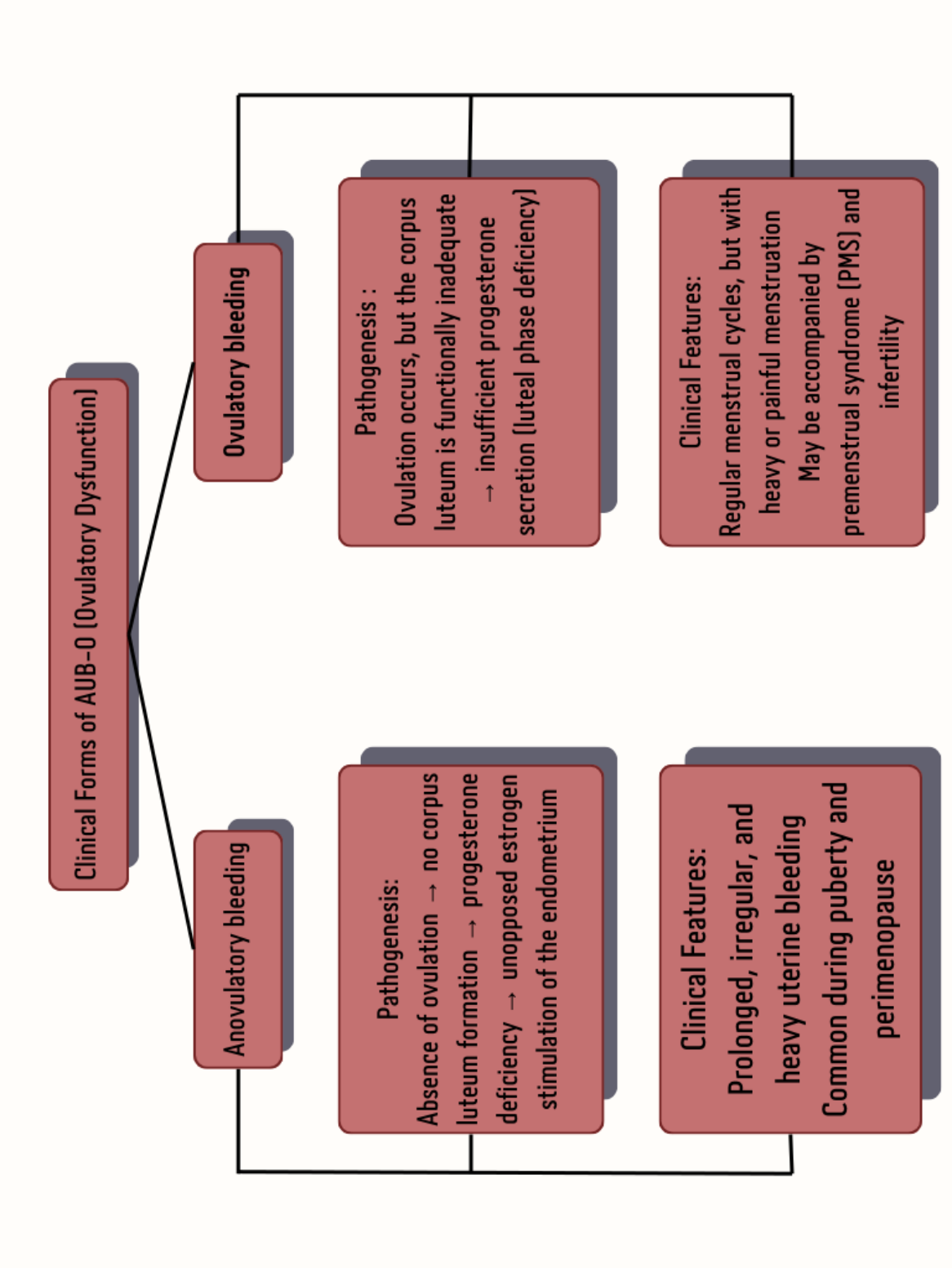

Table 3.3. Clinical Forms of AUB-O

Diagnosis of Abnormal Uterine Bleeding (AUB)

Diagnosis of AUB should be **systematic and stepwise**, with mandatory **exclusion of pregnancy, malignancy, and structural abnormalities**. Patient **age** and the **presumed pathogenetic mechanism** play a crucial role in the diagnostic approach.

I. General Diagnostic Steps for AUB (Applicable to All Age Groups)

1. **Medical History:**

- Menstrual characteristics (volume, duration, regularity)
- Age at menarche
- Association of bleeding with medications, physical exertion, or stress
- Reproductive plans
- Symptoms of **hyperestrogenism**, **hyperandrogenism**, or **hypothyroidism**

2. **Physical Examination:**

- Assessment of **BMI**, skin condition, and **secondary sexual characteristics**
- **Gynecological exam**: evaluation of discharge, cervix, and vaginal condition

3. **Pregnancy exclusion** — the **first and essential step**, particularly in reproductive-age women (**β-hCG test**)

4. **Imaging Studies:**

- **Pelvic ultrasound** (transabdominal or transvaginal): assessment of **endometrial structure**, **endometrial thickness (M-line)**, myometrium, polyps, fibroids
- **Hysteroscopy with targeted endometrial biopsy** — the **gold standard** when hyperplasia or malignancy is suspected

5. **Hormonal Evaluation:**

- **FSH, LH, estradiol, progesterone** (on day 21 of the cycle), **prolactin, TSH, testosterone**
- **Sex hormone-binding globulin (SHBG)** in menstrual disorders

6. **Coagulation profile** — indicated in suspected **AUB-C (coagulopathy)**, especially in adolescents

Diagnosis of AUB by Physiological Age Group

I. Adolescent (Juvenile) Period

During the first **1–2 years post-menarche**, the most common cause of AUB is **anovulatory bleeding** due to **immaturity of the hypothalamic–pituitary–ovarian axis**. However, systemic disorders, especially **coagulopathies** (e.g., **von Willebrand disease**), must also be considered.

- **Diagnostic Approach in Adolescents:**
  - Detailed history: bleeding pattern, duration, associated symptoms
  - **Pelvic ultrasound** (usually transabdominal)
  - **Hormonal profile**: FSH, LH, estradiol, prolactin, TSH
  - **Coagulation profile**, particularly if heavy bleeding started with menarche
  - **Menstrual diary**: to track frequency, duration, and volume of bleeding
  - Pediatric gynecological evaluation; **hematologist consultation** if needed

II. Reproductive Age

In this age group, the **range of possible causes** of AUB is broader. In addition to **ovulatory dysfunction**, common findings include **structural abnormalities** (leiomyomas, polyps, endometrial hyperplasia), **endocrinopathies** (e.g., PCOS, hyperprolactinemia, hypothyroidism), **iatrogenic causes (AUB-I)**, and **pregnancy-related complications** (ectopic pregnancy, incomplete miscarriage, gestational disorders).

- **Essential Diagnostic Steps:**
  - **Rule out pregnancy** – **β-hCG test** is first-line
  - **Gynecological exam** – evaluate cervix and vaginal condition
  - **Transvaginal pelvic ultrasound**
  - **Hormonal screening**: FSH, LH, progesterone (day 21), estradiol, prolactin, TSH, testosterone, SHBG
  - **Biochemical blood tests**: glucose, insulin, lipid profile (for metabolic syndrome)

- **If PCOS is suspected** – follicular mapping, LH/FSH ratio
- **If endometrial pathology is suspected** – **pipelle biopsy** or **hysteroscopy**

III. Climacteric Period

In the **perimenopausal and especially postmenopausal** periods, **any bleeding** from the genital tract is considered **pathological** and requires **exclusion of hyperplasia and malignancy**. This is the **age group** most commonly affected by **endometrial polyps, fibroids, hyperplasia, and endometrial cancer**.

- **Diagnostic approach in this period is focused on oncological vigilance:**
  - **Pelvic ultrasound** with special attention to **endometrial thickness** (*M-line > 5 mm in postmenopausal women is considered suspicious*)
  - **Hysteroscopy with targeted endometrial biopsy** – the **gold standard**
  - **Pipelle biopsy** – as an alternative in outpatient settings
  - **Cervical examination and colposcopy** (if there are additional discharges)
  - **Tumor marker testing** (CA-125 if ovarian cancer is suspected)
  - **Hormonal assays**, if menstrual irregularities are present in perimenopause

Management of AUB According to Physiological Period

Treatment strategy for patients with abnormal uterine bleeding must be **strictly individualized** and based on a **comprehensive clinical evaluation**. Factors considered include **age**, **severity of bleeding**, **presence or absence of anemia**, **cycle regularity**, **ovulatory status**, and **reproductive intentions**. The therapeutic approach is also guided by the **presumed or confirmed etiology** as classified under the **PALM–COEIN system**, which distinguishes **structural** and **non-structural** causes.

I. Adolescent Period

Main goals:

- Stop the bleeding
- Stabilize the menstrual cycle
- Prevent anemia and recurrences

Mild to moderate cases:

- **Combined oral contraceptives (COCs)** in continuous or cyclic regimens (e.g., ethinyl estradiol 20–30 mcg)
- **Progestins alone** (e.g., dydrogesterone, norethisterone) during the second phase of the cycle
- **NSAIDs** (ibuprofen, naproxen) to reduce blood loss
- **Tranexamic acid** – for heavy but non-life-threatening bleeding

Severe juvenile bleeding:

- **Inpatient management**
- **Hemostatic therapy** (e.g., etamsylate, aminocaproic acid)
- **High-dose hormonal therapy** (e.g., double-dose COCs for several days)
- **Hematologic evaluation** for recurrent bleeding (to rule out coagulopathies)

Additional support:

- **Iron supplements** in case of anemia
- **Psychological counseling**, lifestyle modification

II. Reproductive Period

Management depends on the **etiology**, **severity of bleeding**, and **reproductive plans**.

- **For AUB-O (ovulatory dysfunction):**
  - **COCs** — first-line if the cycle is stable and no contraindications are present
  - **Progestins alone** during the second half of the cycle or continuously (dydrogesterone, medroxyprogesterone)
  - **Levonorgestrel-releasing intrauterine system (LNG-IUS)** (e.g., Mirena) — effective for heavy bleeding if no contraindications
- **For endometrial hyperplasia (without atypia):**
  - **Cyclic or continuous progestin therapy** (for 3–6 months)
  - **Follow-up via ultrasound or biopsy**

- **For AUB-P and AUB-L (polyps, leiomyomas):**
  - **Hysteroscopic polypectomy**
  - **Myomectomy** or **uterine artery embolization (UAE)**
  - **Conservative management** of fibroids if asymptomatic or stable
- **Other supportive measures:**
  - **NSAIDs and antifibrinolytics** for moderate bleeding
  - **Correction of endocrine disorders** (e.g., PCOS, hyperprolactinemia, hypothyroidism)
  - **B vitamins, folic acid, and weight management** in metabolic syndrome

III. Climacteric Period

Treatment focuses on **excluding malignancy**, **controlling symptoms**, and **preventing anemia**.

- **First priority: Diagnosis!**

Any postmenopausal bleeding must raise oncological suspicion.

- **If malignancy is ruled out:**
  - **LNG-IUS** — highly effective in controlling hyperplasia, especially in non-atypical forms
  - **Oral progestins** — in cyclic or continuous regimens
  - **Endometrial ablation** — for women with no fertility plans and recurrent bleeding
  - **Symptomatic therapy** (NSAIDs, tranexamic acid) — for mild cases
- **Surgical interventions:**
  - **Hysteroscopy with targeted biopsy** — for diagnosis and polyp removal
  - **Hysterectomy** — for recurrent AUB, coexisting fibroids, atypical hyperplasia, or suspicion of cancer

Questions for the Chapter

I. Multiple-Choice Questions (Single Best Answer)

1. **What is the main criterion for juvenile uterine bleeding?**
   A) Presence of structural endometrial changes
   B) Bleeding duration less than 2 or more than 7 days
   C) Shortened cycle less than 20 days
   D) Corpus luteum persistence

2. **Which methods are used to diagnose anovulatory bleeding?**
   A) Laparoscopy
   B) Ultrasound and progesterone level assessment
   C) Colposcopy
   D) Hysteroscopy

3. **Which condition is associated with endometrial hyperplasia?**
   A) Estrogen deficiency
   B) Absolute hypoestrogenism
   C) Progesterone deficiency
   D) Hyperfibrinolysis

4. **What is characteristic of bleeding caused by follicular persistence?**
   A) Shortened cycle
   B) Heavy and prolonged bleeding
   C) Absence of hyperplastic changes
   D) Moderate-intensity bleeding

5. **Which hormones need to be evaluated in suspected ovulatory bleeding?**
   A) Estradiol and progesterone
   B) LH and FSH
   C) Testosterone and progesterone
   D) Prolactin and progesterone

6. **Which instrumental method is used to assess the endometrium in suspected hyperplasia?**
   A) X-ray
   B) Pelvic ultrasound
   C) Pelvic CT
   D) Vaginal smear analysis

7. **What is the main cause of juvenile bleeding?**
   A) Hyperprolactinemia

B) Follicular atresia
C) Asherman's syndrome
D) Luteal phase insufficiency

8. **What is the main goal of treatment for abnormal uterine bleeding during reproductive age?**
   A) Hormonal hemostasis and anemia prevention
   B) Complete endometrial removal
   C) Ovulation suppression
   D) Surgical treatment

9. **What could be a cause of abnormal bleeding in menopause?**
   A) Asherman's syndrome
   B) Endometrial hyperplasia
   C) FSH deficiency
   D) Hyperprolactinemia

II. Open-Ended Questions (Extended Response Tasks)

1. Explain the differences between ovulatory and anovulatory uterine bleeding.
2. What diagnostic methods are used to assess the endometrium in hyperplasia?
3. Describe the main causes and clinical manifestations of juvenile uterine bleeding.
4. What approaches are used for hormonal hemostasis in dysfunctional uterine bleeding (DUB)?
5. Explain the mechanisms of hyperestrogenism in follicular persistence and its effect on the endometrium.

III. Case-Based Clinical Scenarios

Case №1

A 15-year-old girl presents with prolonged bleeding after a 2-month menstrual delay. Ultrasound shows no preovulatory follicle; progesterone level is 6 nmol/L.

1. What is the likely diagnosis?
2. What additional investigations should be performed?

3. What treatment would you recommend?

Case №2

A 38-year-old woman complains of heavy and irregular periods. Ultrasound reveals thickened endometrium and a shortened luteal phase.

1. What is the preliminary diagnosis?
2. What diagnostic methods should be used?
3. What treatment approaches are advisable?

Case №3

A 45-year-old woman reports irregular heavy bleeding. Ultrasound shows endometrial hyperplasia and a submucous fibroid.

1. What is the likely diagnosis?
2. What are the stages of diagnosis and treatment?
3. What preventive measures can be recommended?

All supplementary self-assessment materials are available in the Telegram channel:

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Chapter №4. Bleeding in the First Half of Pregnancy

Bleeding during pregnancy, labor, and the early postpartum period remains one of the most **common and dangerous complications** in obstetric practice. It ranks among the **leading causes of maternal mortality** and significantly increases the risk of **perinatal fetal death**.

According to **epidemiological data**, the incidence of obstetric hemorrhage ranges from **3% to 8%** of all deliveries, while **gestational bleeding** occurs in approximately **2–3%** of pregnant women.

Obstetric hemorrhages are characterized by distinct clinical features that define their **severity and urgency**:

- They typically **begin suddenly**,
- Are accompanied by **significant blood loss**,
- Cause **intense pain**,
- And lead to **rapid depletion of compensatory mechanisms** due to the **physiological characteristics of hemodynamics and the hemostatic system** in pregnant women.

Despite constant attention from obstetricians and ongoing **advancements in diagnostics and treatment**, bleeding during pregnancy **continues to pose a serious threat** to both **maternal and fetal health**.

Main Causes of Bleeding in the First Half of Pregnancy

Bleeding occurring **before 20 weeks of gestation** is an **important diagnostic and prognostic marker**, often indicating **pathological processes** of both **obstetric** and **non-obstetric** origin. These conditions require **urgent medical attention**, as they may endanger **maternal life** or **pregnancy viability**.

Based on **etiology**, bleeding in early pregnancy is divided into two main groups:

1. Bleeding Not Related to Pregnancy

This group includes conditions in which bleeding occurs **independently of gestation**, often due to **gynecological pathology** or **coagulopathies**. Common causes include:

- **Cervical erosion or ectropion** – may cause contact bleeding during intercourse or pelvic examination.
- **Cervical polyps** – may lead to spotting or contact bleeding.
- **Vaginitis or cervicitis** – inflammatory processes with mucosal hyperemia and increased vascular permeability.
- **Hemostatic disorders** – congenital or acquired **coagulopathies** that result in spontaneous bleeding without structural uterine abnormalities.

Management of such patients requires **thorough differential diagnosis** to rule out **abnormal pregnancy**, along with:

- **Gynecological examination**
- **Colposcopy**
- **Hemostasis assessment**
- **Infectious disease screening**

2. Bleeding Related to Pregnancy

This group includes conditions **directly related to gestation**. These are the **primary causes of first-trimester obstetric bleeding** and demand **urgent clinical evaluation** (see Fig. 4.1).

Abnormal Intrauterine Pregnancy

The **classic scenario** is **spontaneous abortion**, which may progress through the following stages:

- **Threatened miscarriage**
- **Inevitable miscarriage**
- **Miscarriage in progress**
- **Incomplete miscarriage**
- **Complete miscarriage**

The bleeding pattern may vary from **light spotting** to **heavy hemorrhage**, often accompanied by **pelvic pain** and **cervical dilation**.

Depending on the stage of the process, the clinical team must determine whether the **pregnancy can be preserved** or whether it is necessary to **terminate and evacuate** the uterine contents.

Ectopic Pregnancy

Ectopic pregnancy refers to the **abnormal implantation** of the fertilized ovum **outside the uterine cavity**, most commonly in the **fallopian tube**. At a certain gestational age (typically between **5–7 weeks**), this may result in **tubal rupture** or **tubal abortion**, accompanied by **internal and/or external bleeding**.

This condition is **life-threatening** and may lead to **hemorrhagic shock**, requiring **emergency hospitalization and surgical intervention**.

Ectopic pregnancy should be suspected in the presence of:

- a **positive pregnancy test**,
- **lower abdominal pain**, and
- **absence of a gestational sac** in the uterus on ultrasound.

Diseases of the Gestational Sac

The most notable is **hydatidiform mole (molar pregnancy)** — a form of **gestational trophoblastic disease** characterized by **abnormal proliferation of chorionic villi**, forming **cystic structures**.

Clinical features include:

- **uterine bleeding**,
- **uterine size disproportionate to gestational age** (usually larger),
- **severe nausea/vomiting**,
- **excessively elevated levels of hCG**, often several times higher than normal.

Spontaneous Abortion

Spontaneous abortion is defined as the **loss of pregnancy before fetal viability**, i.e., **before 22 weeks of gestation**. It is one of the most common causes of bleeding in the first half of pregnancy.

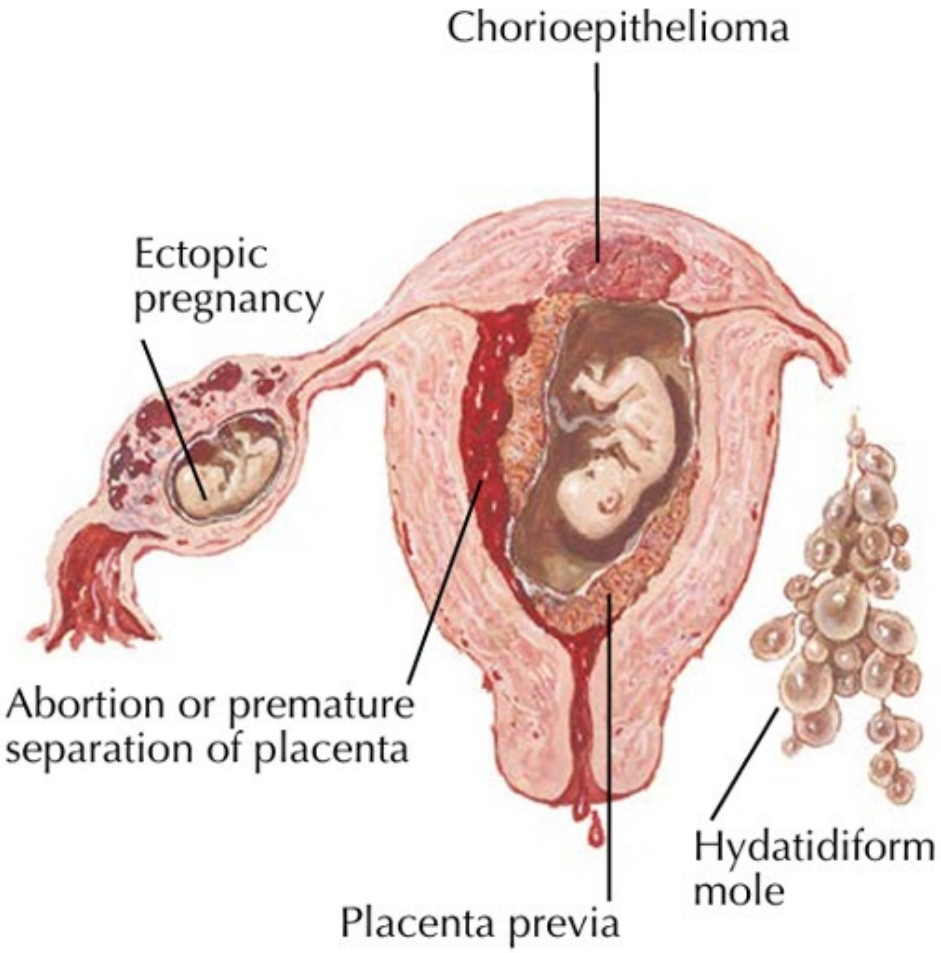

Figure 4.1. Pregnancy-Related Bleeding

4.1. Spontaneous Miscarriages

Clinical Forms of Spontaneous Abortion

From a clinical standpoint, spontaneous abortion progresses through several **distinct stages**:

- **Threatened abortion**
- **Inevitable abortion**
- **Abortion in progress**
- **Incomplete abortion**
- **Complete abortion**

Key symptoms across all forms include:

- **abdominal pain** and
- **vaginal bleeding**

Diagnosis is based on:

- the **character of the bleeding and pain**,
- **cervical status**, and
- **uterine size**, which together help differentiate the stage.

Threatened and Inevitable Abortion

- **Threatened abortion**: The gestational sac remains attached. The uterus is enlarged according to gestational age; the cervix is **closed**; pain and bleeding are **mild to moderate**.
- **Inevitable abortion**: Characterized by **cramping pain** and **vaginal bleeding** due to **partial detachment** of the gestational sac. The cervix is **slightly open**, and the uterus remains **appropriate in size** for gestation.

Management in both cases focuses on **pregnancy preservation**:

- **Bed rest**,
- **Sedatives**,
- **Antispasmodics** (e.g., gangleron, drotaverine, metamizole),
- **Hemostatics** (e.g., etamsylate),
- **Hormonal support** in case of luteal phase deficiency.

If **amniotic fluid leakage** occurs, pregnancy continuation is typically **not recommended**.

Abortion in Progress and Incomplete Abortion

- **Abortion in progress**: The **expulsion of the gestational sac** has begun. Accompanied by **intense cramping** and **profuse bleeding**. The cervix is **open**, and the sac may be partially visible in the **cervical canal**.
- **Incomplete abortion**: After expulsion of the embryo/fetus, **retained products of conception (RPOC)** remain in the uterine cavity (e.g., placental

fragments). Presents with **cramping pain**, **continued bleeding**, a **soft uterus**, and a **cervix that remains open**.

Emergency Management

Pre-hospital care includes:

- Ensuring **emotional and physical rest**,
- **Cold application** to the lower abdomen,
- **Intramuscular injection of oxytocin**,
- Hemostatic and **vascular stabilizing agents** (e.g., etamsylate, calcium, ascorbic acid),
- **Urgent referral** to a hospital.

In-hospital care includes:

- **Clinical and laboratory evaluation**, including:
  - CBC,
  - blood type and Rh factor,
  - HIV and syphilis screening
- **Surgical uterine evacuation** to remove retained tissue
- **Blood loss replacement**, if indicated

4.2. Ectopic Pregnancy

Ectopic pregnancy refers to any gestation in which the **implantation and development** of the fertilized ovum occur **outside the uterine cavity**. The **most common site** of ectopic implantation is the **fallopian tube**, accounting for more than **98% of cases**. Less frequently, implantation may occur in the **ovary**, **rudimentary uterine horn**, **cervix**, or **abdominal cavity**.

Classification

Ectopic pregnancies are classified according to the **site of implantation**:

- **Tubal pregnancy** – the most common form, further divided based on location into:

    - **Ampullary**
    - **Isthmic**
    - **Interstitial (cornual)**
      Depending on the course, it may be:
    - **Progressive** (ongoing development)
    - **Disrupted** (resulting in **tubal abortion** or **tubal rupture**)
- **Ovarian pregnancy** – implantation on or within the ovary
- **Abdominal pregnancy** – can be:
    - **Primary** (initial implantation in abdominal organs)
    - **Secondary** (expulsion from the tube followed by reimplantation in the abdominal cavity)
- **Pregnancy in a rudimentary uterine horn**, **cervical canal**, or **uterine isthmus**

Risk Factors

There are two main categories of risk factors for ectopic pregnancy:

1. Fertilization-related anomalies, including those arising during **assisted reproductive technologies (ART)**, which increase the risk of ectopic implantation by **fourfold**.

2. Impaired tubal transport, including:

- Pelvic inflammatory disease (PID)
- Post-abortion complications
- Tubal anatomical abnormalities
- Intrauterine device (IUD) use
- Endometriosis
- Pelvic adhesions
- Previous surgeries or trauma

Hormonal and functional factors also play a role, such as:

- **Reduced tubal motility/peristalsis** due to **progesterone** or **nicotine exposure**, the latter especially common among **smokers**

Pathogenesis

Implantation of the fertilized ovum outside the uterus leads to its development in an environment **lacking adequate vascular supply and nutrients**. The **trophoblast** invades and erodes the surrounding tissue, **damaging blood vessels**.

As the gestational sac enlarges, it causes **distension** of surrounding structures. Eventually, this can result in **rupture** and **intra-abdominal hemorrhage**, most often occurring between **4 and 6 weeks** of gestation.

Clinical Presentation

The **clinical manifestations** of ectopic pregnancy vary depending on its **stage** (progressive or disrupted) and the **type of disruption** — either a **tubal abortion** or a **tubal rupture**.

Classical symptoms include:

- **Missed period (amenorrhea)**
- **Breast tenderness**
- **Altered taste perception**, **nausea**
- **Lower abdominal pain**
- **Spotting or light vaginal bleeding**

On **gynecological examination**, the following findings may be observed:

- **Bluish discoloration (cyanosis)** of the vaginal and cervical mucosa
- **Softening and enlargement of the uterus**
- **Palpable mass** in the **adnexal region**

A **key clinical sign** is a **discrepancy between gestational age and uterine size**, especially when a **mass is detected** in the area of the **fallopian tube or ovary**.

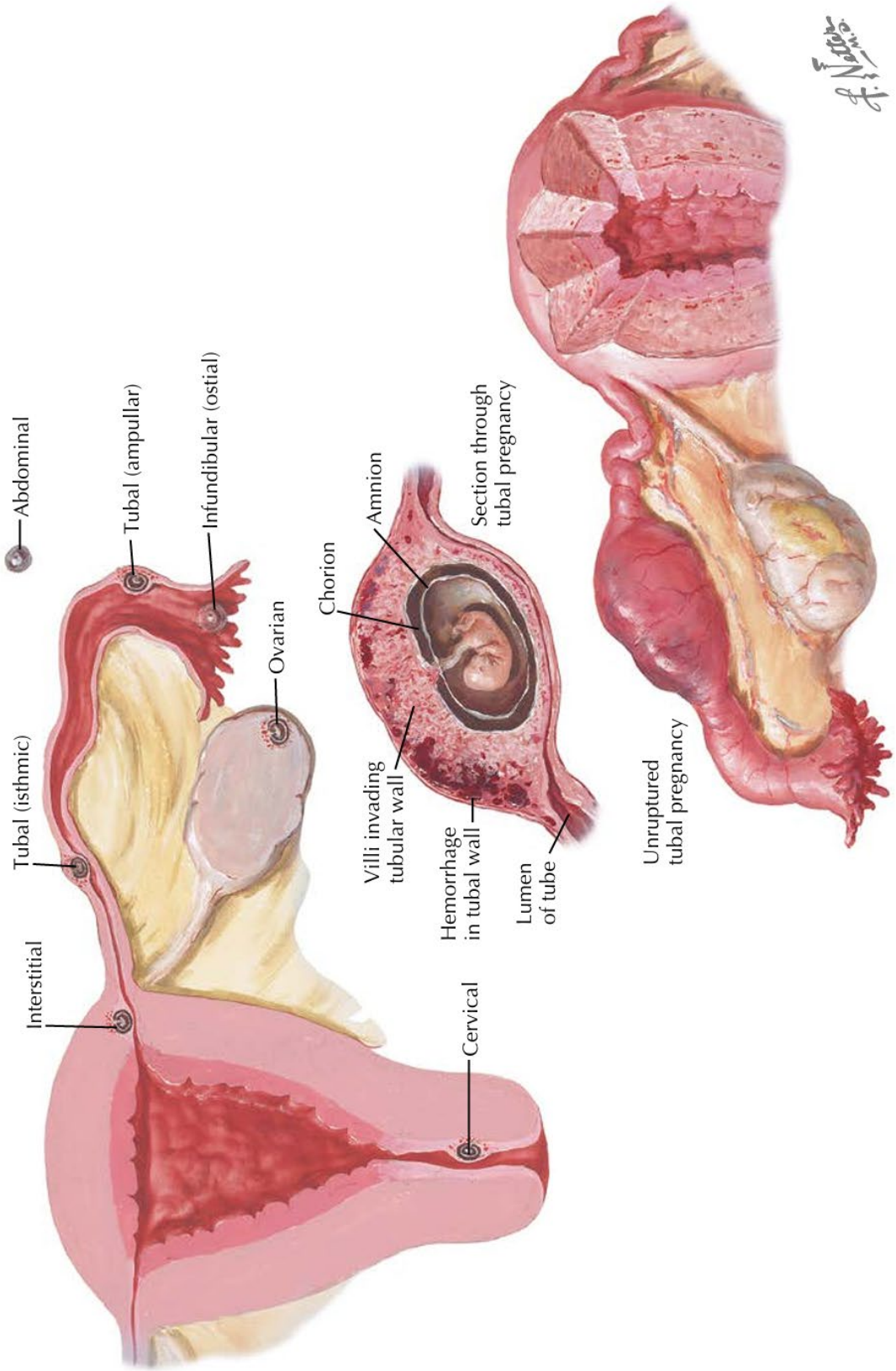

Рисунок 4.2. Ввозможная локализации внематочной беременности:

Abnormal adnexal structures or **distorted uterine contours** are frequently noted.

- In **cervical ectopic pregnancy**, the uterus often appears **flask-shaped**
- In **abdominal pregnancy**, **dense masses of varying location** may be palpated in the abdomen

Failure to respond to **hormonal or hemostatic therapy**, along with **clinical deterioration**, requires **urgent surgical intervention**.

Ectopic pregnancy should always be suspected in cases of:

- **Amenorrhea**,
- **Pelvic pain**, and
- **Vaginal bleeding**, especially if **no intrauterine gestational sac** is visualized on **transvaginal ultrasound (TVUS)**.

Ruptured Ectopic Pregnancy

A **ruptured ectopic pregnancy** is a **life-threatening condition** that requires **immediate medical intervention**. The most common forms include **tubal rupture** and **tubal abortion**, while less common types involve **ovarian rupture** or rupture of the **gestational sac in abdominal implantation**. All of these scenarios result in varying degrees of **intra-abdominal hemorrhage**, which determines the **clinical severity**.

Tubal Rupture

Tubal rupture is accompanied by **massive internal bleeding**. As **chorionic villi** erode the thin wall of the fallopian tube, adjacent blood vessels are damaged, resulting in **hemoperitoneum**.

Symptoms develop **rapidly** and reflect an **acute abdomen**:

- **Sudden onset of severe lower abdominal pain**, possibly preceded by **cramping episodes** ("tubal colic") due to tubal peristalsis
- **Syncope** may occur at the peak of pain
- Additional symptoms:
    - **Nausea**, **dizziness**, **pallor**
    - **Profuse cold sweat**, **hypotension**

- **Rapid, weak pulse**
- **Diarrhea**, due to peritoneal irritation

On examination:

- Abdomen is **distended, tense, and tender**
- **Dullness on percussion** in dependent areas suggests blood accumulation
- **Gynecological findings**:
  - **Bluish (cyanotic) discoloration** of the vaginal and cervical mucosa
  - **Soft, slightly enlarged, mobile uterus**
  - **Adnexal mass** palpable
  - **Posterior vaginal fornix is bulging and extremely tender** on cervical motion

Tubal Abortion

In contrast to rupture, **tubal abortion** develops **more gradually**. The fertilized ovum **detaches from the tubal wall** and is expelled into the abdominal cavity, accompanied by **intermittent bleeding** due to **rhythmic tubal contractions**.

Clinical features include:

- **Cramping lower abdominal pain**
- **Dark brown or nearly black spotting**, caused by sloughing of the decidual lining due to a **sharp drop in steroid hormones**
- **Syncope**, **weakness**, **dizziness**, **cold sweat**, and **vomiting** may be present

On examination:

- **Cyanotic vaginal mucosa**, scant cervical discharge
- Uterus is **slightly enlarged**, inconsistent with gestational age
- **Adnexal mass** with **irregular borders**, **limited mobility**
- **Flattening or bulging of lateral and posterior fornices**, with marked tenderness

Rare Forms of Ectopic Pregnancy

Ovarian Pregnancy

Implantation occurs **on or within the ovary**. Often associated with **endometriosis** or **ovulatory dysfunction**. The trophoblast fails to develop normally, and pregnancy terminates early. The clinical picture mimics tubal pregnancy: **pain**, **hemoperitoneum**, **peritoneal signs**, and **rapid deterioration**.

Abdominal Pregnancy

Extremely rare. Implantation occurs in the **abdominal cavity**, often on the **omentum** or **peritoneum**. Typically diagnosed early due to rapid **capsule rupture**. Symptoms include **recurrent pain**, **sharp pain on movement**, **fainting**, and **shock**. On **bimanual examination**, the fetus may be palpated **outside the uterus**, under the **abdominal wall**.

Cervical and Cervico-isthmic Pregnancy

Rare but **extremely dangerous** due to **profuse hemorrhage**. The **cervix becomes barrel-shaped**, **cyanotic**, and **bleeds easily**, with an **eccentrically located external os**. Diagnosis is confirmed via **ultrasound**. **Curettage is contraindicated**, as it provokes heavy bleeding. **Surgical management** is mandatory — usually a **hysterectomy** without adnexa.

Pregnancy in a Rudimentary Uterine Horn

This condition is diagnosed by palpation of a **dense mass lateral to the uterus**. If rupture occurs, symptoms of **internal bleeding** and **hemorrhagic shock** appear. Diagnosis is confirmed through **ultrasound and laparoscopy**.

Diagnosis and Treatment of Ectopic Pregnancy

Diagnosis

The diagnostic workup for suspected ectopic pregnancy involves several key steps:

1. Medical History

The patient typically reports a **missed period** and **presumptive or probable signs of pregnancy**. Risk factors may include:

- **Pelvic inflammatory disease (PID)**
- **Previous pelvic or abdominal surgery**
- **Use of intrauterine devices (IUDs)**

- **Smoking**
- **Assisted reproductive technologies (ART)**

2. General and Gynecological Examination

The clinical presentation is often characterized by signs of **intra-abdominal bleeding**:

- **Pallor**, **cold sweat**, **hypotension**, **tachycardia**
- **Peritoneal irritation signs**, including:
    - Abdominal **distension**, **tenderness**, and a **positive Blumberg's sign (rebound tenderness)**

Bimanual pelvic examination may reveal:

- Slightly **enlarged, mobile uterus**
- **Adnexal tenderness or a doughy mass**
- **Bulging of the posterior vaginal fornix**
- **Sharp pain upon cervical motion** (Douglas pouch irritation)

3. Laboratory and Imaging Tests

- **Serum β-hCG levels** are often **lower than expected** for gestational age
- **Transvaginal ultrasound (TVUS)** typically shows:
    - **Absence of an intrauterine gestational sac**
    - Possibly, an **echogenic mass** in the adnexal region
- **Culdocentesis** may detect intra-abdominal bleeding but is now largely replaced by **ultrasound**
- **Endometrial biopsy** may be used to differentiate from **spontaneous abortion**:
    - Reveals **decidual tissue without chorionic villi**
- **Diagnostic laparoscopy** remains the **gold standard** in unclear cases, allowing direct visualization and often immediate treatment

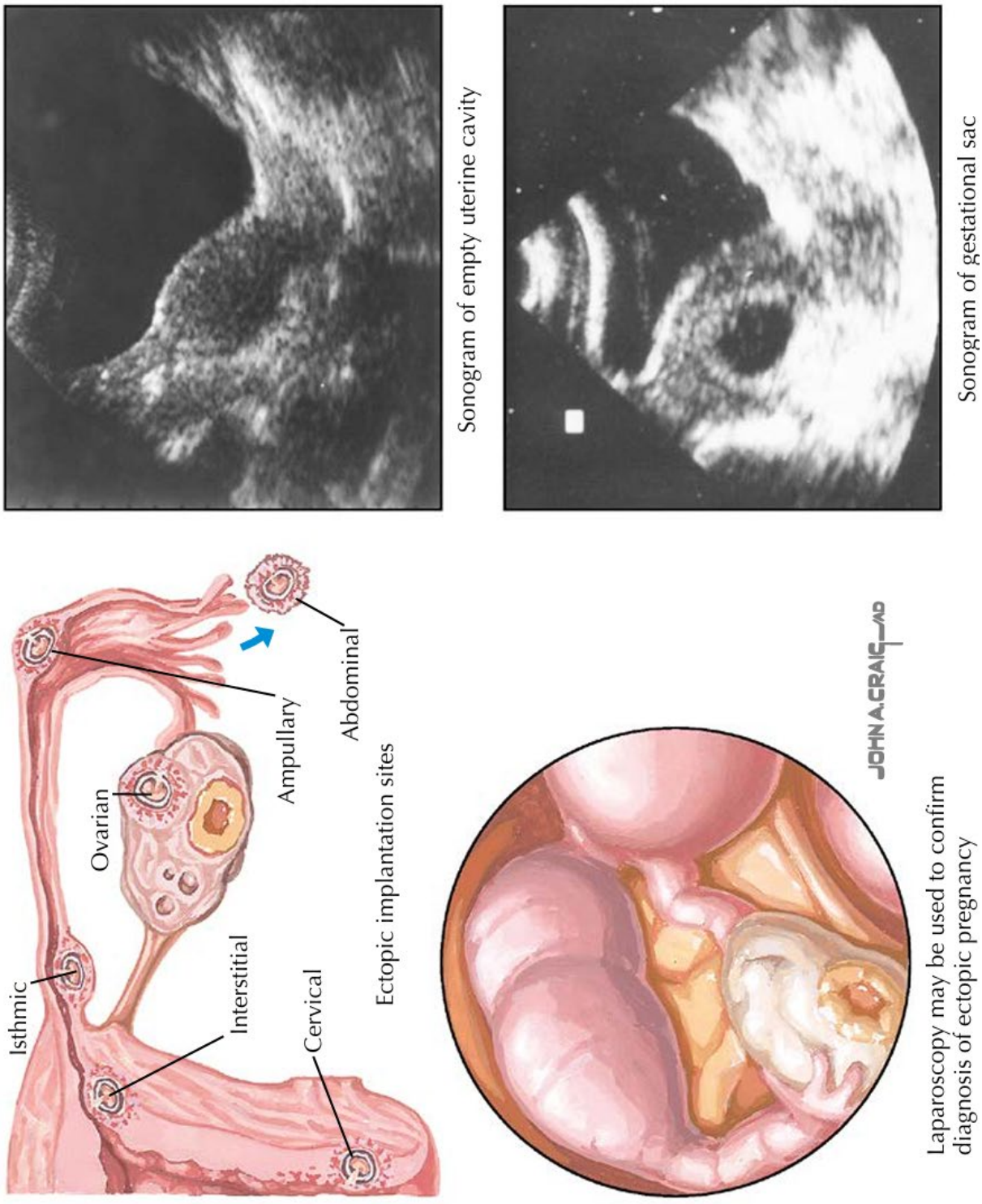

Figure 4.3. Laparoscopy can be used not only for treatment but also for confirming the diagnosis of ectopic pregnancy.

Treatment

Management of ectopic pregnancy includes **three stages**:

1. **Surgical intervention**
2. **Postoperative care**
3. **Rehabilitation and follow-up**

Stage I – Surgical Treatment

In cases of **tubal pregnancy**, either:

- **Organ-preserving surgery (salpingotomy)**, or
- **Removal of the fallopian tube (salpingectomy)**

can be performed via **laparoscopy or laparotomy** (see Figure 4.3).

In patients with **massive bleeding**, **immediate resuscitation** is critical and includes:

- **Intravenous fluids and blood transfusion**
- **Assessment of blood group and coagulation profile**

Stage II – Postoperative Care

This stage includes **intravenous fluid therapy**, **pain management**, **antibacterial prophylaxis**, **physiotherapy**, and **respiratory exercises**. **Hydrotubation** may be initiated starting from the **4th–5th postoperative day**.

Stage III – Reproductive Function Rehabilitation

Approximately **one month after surgery**, **physiotherapeutic** and **medication-based** rehabilitation begins. The regimen includes:

- **Enzyme preparations**
- **Hormonal contraceptives**
- **Regular clinical follow-up**

Repeated rehabilitation courses are recommended at **3, 6, and 12 months** postoperatively.

4.3. Gestational Trophoblastic Disease. Hydatidiform Mole.

Gestational trophoblastic disease (GTD) is a group of pathological conditions resulting from **abnormal proliferative growth of the trophoblast**. It is characterized by **excessive development of chorionic villi** with **disrupted differentiation of placental tissue**, and is typically accompanied by **hypersecretion of human chorionic gonadotropin (hCG)**.

The main forms of GTD include:

- **Hydatidiform mole** (complete and partial)
- **Invasive mole** and **destructive mole**
- **Choriocarcinoma**

The **invasive mole** is distinguished by marked proliferative activity and the ability to invade the **myometrium**, although it rarely leads to distant metastases. In contrast, **choriocarcinoma** is a **malignant tumor** with high metastatic potential and aggressive clinical behavior.

Hydatidiform Mole

A **hydatidiform mole** is a pathological condition characterized by **transformation of chorionic villi** into multiple cystic structures resembling **clusters of grapes**. These cysts **partially or completely fill the uterine cavity** and may be accompanied by significant clinical symptoms.

There are two main forms of hydatidiform mole:

- **Complete mole** – no fetal or embryonic tissue is present (see Figure 4.4)
- **Partial mole** – embryonic or fetal elements may be present in the uterine cavity

Partial moles are often associated with **chromosomal abnormalities** and **rarely undergo malignant transformation**.

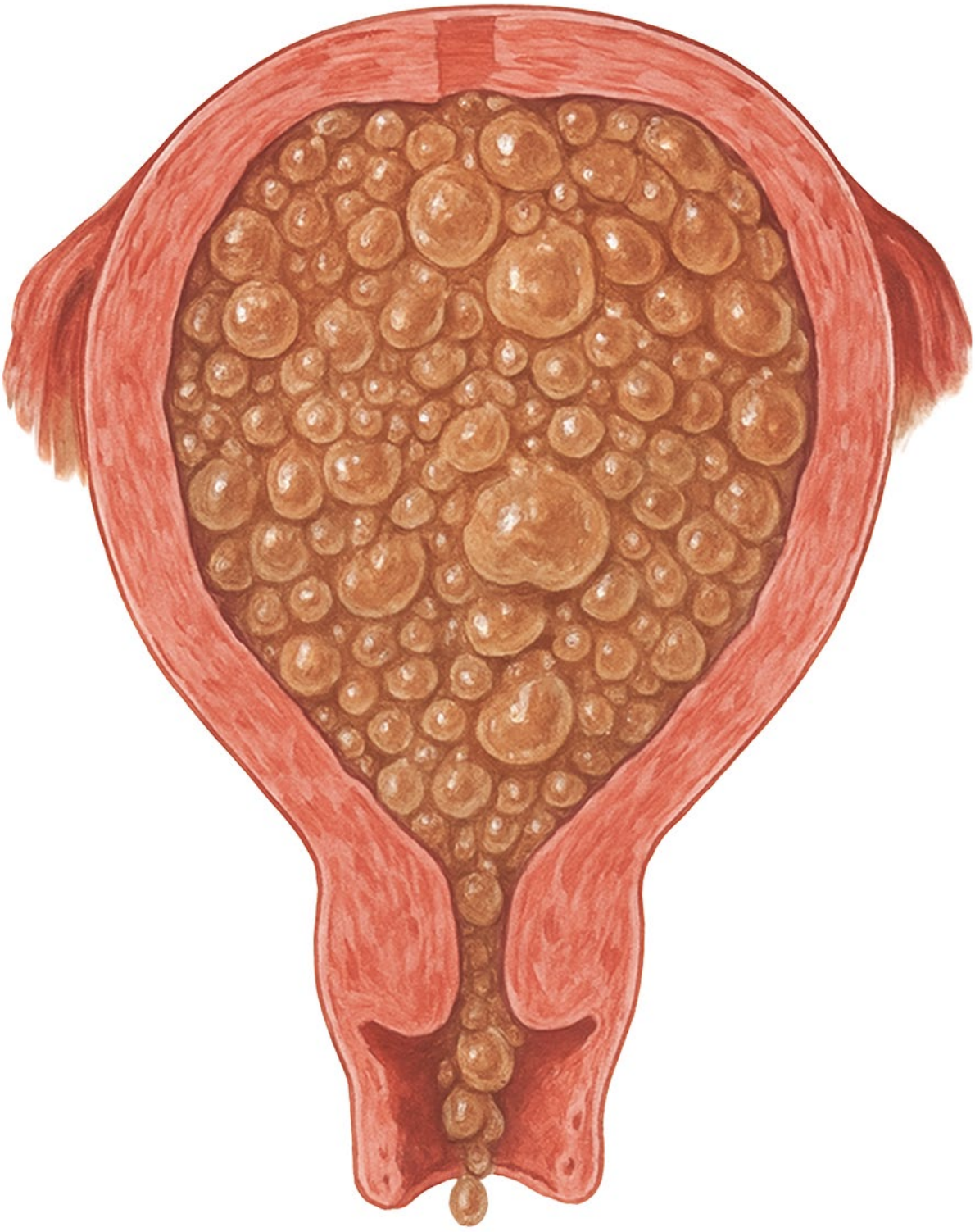

Figure 4.4. Complete Hydatidiform Mole

Clinical Presentation

Hydatidiform mole presents with a number of characteristic clinical features:

The woman typically reports **missed periods** and believes she is pregnant. During the **first trimester**, **vaginal bleeding** of varying intensity and color is common—ranging from light spotting to **heavy bleeding** requiring hemostatic therapy. In some cases, **grape-like vesicles** may be expelled with the blood.

The **size of the uterus** is usually **disproportionately larger** than expected for the gestational age, due to proliferation of chorionic villi and accumulation of blood. There are **no reliable signs of a viable pregnancy**, such as fetal heartbeat or movement.

Ultrasound examination reveals a **heterogeneous, multicystic intrauterine mass** without any evidence of a gestational sac or embryo. **Bilateral theca-lutein ovarian cysts** are often observed, resulting from gonadotropin hyperstimulation.

Early-onset gestational toxicosis with **hypertension**, **proteinuria**, and **edema** may occur. Eclampsia is rare.

Diagnosis

The diagnosis of hydatidiform mole is based on:

- **Typical clinical presentation**
- **Markedly elevated serum hCG levels**, significantly exceeding normal values for the gestational age
- **Ultrasound findings** (absence of fetus and gestational sac, cystic intrauterine structure)
- **Histological examination** of the evacuated tissue

Differential diagnosis includes spontaneous abortion, multiple pregnancy, and **choriocarcinoma**.

Treatment and Follow-Up

Upon diagnosis, **immediate hospitalization** and **evacuation of uterine contents** are indicated. If **hCG levels do not decline** within **1–2 months** following the procedure, further evaluation is necessary to rule out choriocarcinoma.

Follow-up involves:

- **Long-term monitoring for at least one year**, including regular measurement of **hCG levels** in blood and urine
- **Chest X-rays** to detect possible metastases

Women are strongly advised to **avoid pregnancy for at least two years** after treatment.

Questions for the Chapter

I. Multiple-Choice Questions (Single Best Answer)

1. **What is the most common symptom of a tubal pregnancy?**
   A) Missed period
   B) Intense lower abdominal pain
   C) Heavy uterine bleeding
   D) Nausea and vomiting

2. **What is characteristic of a complete hydatidiform mole?**
   A) Complete absence of the fetus
   B) Fetus present with partial placental changes
   C) Presence of blood vessels in villi
   D) Placenta completely preserved

3. **Which method is considered the "gold standard" in diagnosing ectopic pregnancy?**
   A) Ultrasound and β-hCG level measurement
   B) Laparoscopy
   C) MRI
   D) Progesterone test

4. **What is the most predisposing factor for ectopic pregnancy?**
   A) Chronic endometritis
   B) Premature aging of the placenta
   C) Hyperfibrinolysis
   D) Trophoblast hyperactivity

5. **What is characteristic of choriocarcinoma?**
   A) No metastases
   B) Bleeding during menopause

C) Presence of chorionic epithelium
D) Preservation of villous structure

6. **Which form of ectopic pregnancy is most common?**
   A) Abdominal
   B) Tubal
   C) Ovarian
   D) Cervical

7. **What is the recommended treatment for complete hydatidiform mole?**
   A) Chemotherapy
   B) Hysterectomy
   C) Surgical removal of uterine contents
   D) Expectant management

8. **Which hormonal marker is most informative for monitoring hydatidiform mole dynamics?**
   A) Progesterone
   B) hCG
   C) Estrogen
   D) LH

9. **What symptoms may indicate metastases in invasive mole?**
   A) Dyspnea and tachypnea
   B) Mild lower abdominal pain
   C) Nausea and headache
   D) Oliguria

II. Open-Ended Questions (Extended Response Tasks)

1. Explain the mechanism of ectopic pregnancy development and its main clinical symptoms.
2. Describe the diagnosis and treatment of hydatidiform mole. How do you distinguish between complete and partial mole?
3. What complications may arise from an undiagnosed tubal pregnancy?
4. Describe the symptoms of choriocarcinoma and treatment approaches.
5. Explain why β-hCG levels are important in the diagnosis and monitoring of pregnancy.

III. Case-Based Clinical Scenarios

Case №1

A 28-year-old woman presents with complaints of a 6-week missed period, lower abdominal pain, and mild spotting. Ultrasound shows an enlarged uterus with no gestational sac inside; an echogenic mass is seen in the right fallopian tube.

Questions:

1. What is the most likely diagnosis?
2. Which tests can confirm the diagnosis?
3. What treatment is required?

Case №2

A 35-year-old woman complains of heavy bleeding and severe pain following a medical abortion. Ultrasound reveals echogenic structures in the uterine cavity.

Questions:

1. What is the most likely diagnosis?
2. What complications may develop?
3. What treatment is required?

All supplementary self-assessment materials are available in the Telegram channel:

https://t.me/+_H6LveAOXTw1ZmYy

Or scan the QR code:

Chapter №5. Inflammatory Diseases of the Female Genital Organs of Non-Specific Etiology

General Information

Inflammatory diseases of the female reproductive system occupy a leading position in the structure of gynecological pathology, accounting for **60–65%** of all visits to women's clinics. These conditions are divided into **non-specific** and **specific** etiologies.

- **Non-specific inflammation** is caused by **conditionally pathogenic microflora**, including *Staphylococcus aureus*, *Escherichia coli*, *Streptococcus spp.*, and *Pseudomonas aeruginosa*.
- **Specific infections** are caused by pathogens such as *Trichomonas vaginalis*, *Neisseria gonorrhoeae*, *Candida spp.*, viruses, *Chlamydia trachomatis*, and *Mycoplasma spp.*

I. Vulvitis

Vulvitis is an inflammatory condition of the **external genitalia**, including the **mons pubis**, **labia majora and minora**, **vestibule of the vagina**, and **clitoris**. It is one of the most common inflammatory diseases in girls and women, especially during periods of **reduced estrogen levels**—such as **childhood**, **postmenopause**, and **puberty**.

Etiology

Vulvitis is classified into:

- **Primary vulvitis** — occurs due to **direct exposure** of the external genitalia to **traumatic or infectious agents**. It is more common in **girls** and **postmenopausal women**, where the mucosa is **thinner** and more **sensitive**.
- **Secondary vulvitis** — develops as a result of inflammation spreading from the **vagina**, **cervix**, or **urethra**.

Most common pathogens:

- *Staphylococcus aureus*
- *Escherichia coli*
- *Streptococcus spp.*

- *Candida* species
- Occasionally: **Herpes simplex virus (HSV)**, **Cytomegalovirus (CMV)**

Predisposing Factors

- **Poor personal hygiene**
- **Foreign bodies** (e.g., toilet paper remnants)
- **Frequent washing with soap**, leading to disruption of the local microbiome
- **Wearing tight or synthetic underwear**
- **Allergic reactions** (to detergents, sanitary pads)
- **Helminthic infestations** (e.g., enterobiasis)
- **Systemic conditions** such as **diabetes mellitus**, **immunodeficiency**
- In children: **anatomical proximity** of the anus to the vulva and **immature local immunity**
- **Hypoestrogenism** in **prepubertal girls** and **postmenopausal women**

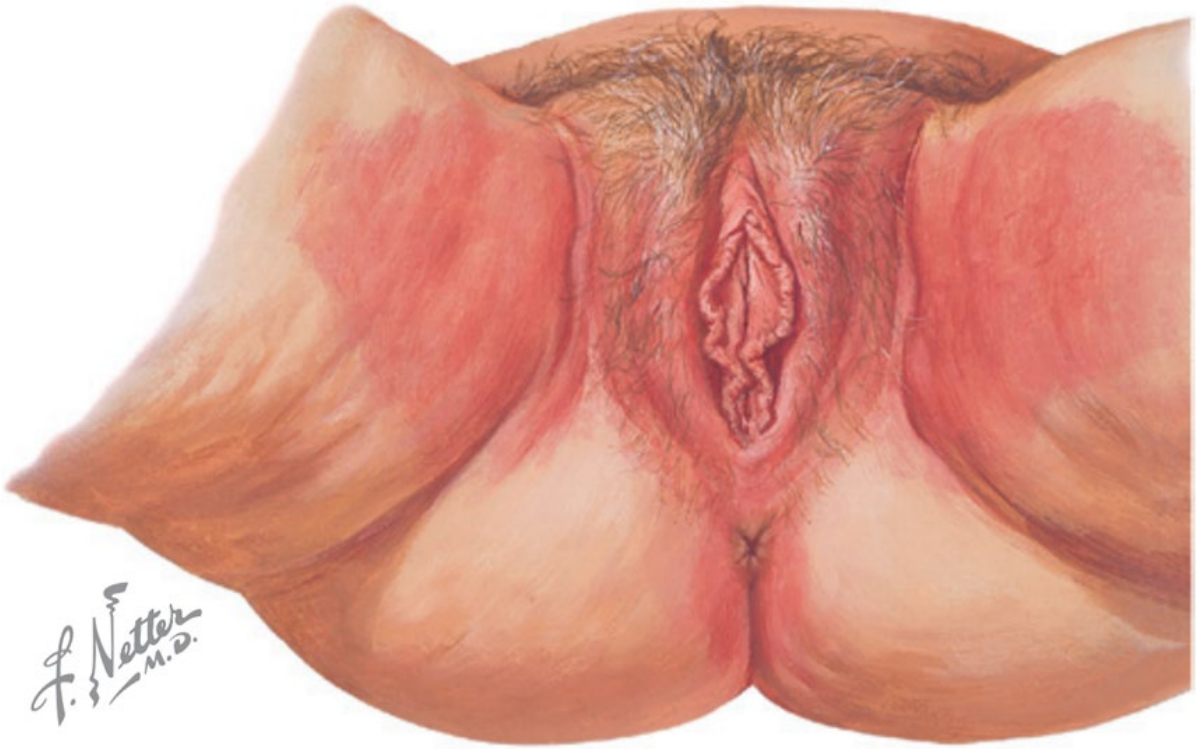

Figure 5.1. Vulvitis

Clinical Presentation:

In the acute phase, patients typically report:

- itching, burning, and redness of the external genitalia;
- pain that intensifies during urination, defecation, or walking;
- mucopurulent or purulent vaginal discharge;
- vulvar edema and hyperemia, excoriations, and maceration.

In the chronic form, symptoms are less pronounced: there is persistent discomfort, mild erythema, dryness, and a sensation of irritation.

In girls, additional symptoms may include sleep disturbances, increased anxiety, fear of urination, and irritability.

Diagnosis:

The diagnosis is based on the patient's complaints, physical examination, microscopic analysis of vulvar and vaginal smears, bacteriological cultures, and exclusion of sexually transmitted infections (STIs).
In cases of suspected allergy, consultation with a dermatologist or allergist is recommended.

Treatment:

Treatment should be comprehensive, targeting both symptom relief and the underlying cause.

- **Hygienic measures:** washing with boiled water or a weak antiseptic solution (e.g., chamomile, furacilin, or miramistin); elimination of irritants.
- **Topical therapy:** antiseptic baths; creams with anti-inflammatory and antimicrobial properties (e.g., ointments containing dexpanthenol, miramistin, or clotrimazole; in cases of candidiasis — antifungal agents).
- **Systemic medications:** in cases of pronounced inflammation or chronic infection, antibiotics, antifungals, or anthelmintic agents may be prescribed based on indications.
- **Management of the underlying condition** if vulvitis is a manifestation thereof (e.g., sanitation of infection foci, glycemic control in diabetes).

II. Bartholinitis

Bartholinitis is an inflammatory condition of the greater vestibular gland (Bartholin's gland), involving its excretory duct and/or parenchyma. The disease occurs predominantly in women of reproductive age and is typically unilateral.

Etiology:

Causative agents may include both opportunistic bacteria (such as *Staphylococcus aureus*, *Escherichia coli*, *Proteus spp.*, and *Pseudomonas aeruginosa*) and specific pathogens like *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and *Trichomonas vaginalis*.
Infection usually ascends from the vagina and urethra, particularly in the presence of concomitant colpitis, urethritis, or disturbances in the vaginal microbiota.

Pathogenesis:

The disease typically begins as canaliculitis—an inflammation of the gland's excretory duct. As the infection progresses, it may spread into the glandular tissue, leading to serous or purulent inflammation and the formation of a pseudoabscess or a true abscess.

- A **pseudoabscess** occurs when the duct becomes obstructed and pus accumulates in the dilated gland without parenchymal destruction.
- A **true abscess** results from purulent destruction of the glandular tissue and adjacent structures.

Clinical Presentation:

Depending on the stage of the inflammatory process, the following forms are distinguished:

1. **Acute Canaliculitis**
    - Mild tingling or discomfort in the area of the vaginal vestibule;
    - Slight swelling and tenderness along the course of the duct;
    - Low-grade fever.

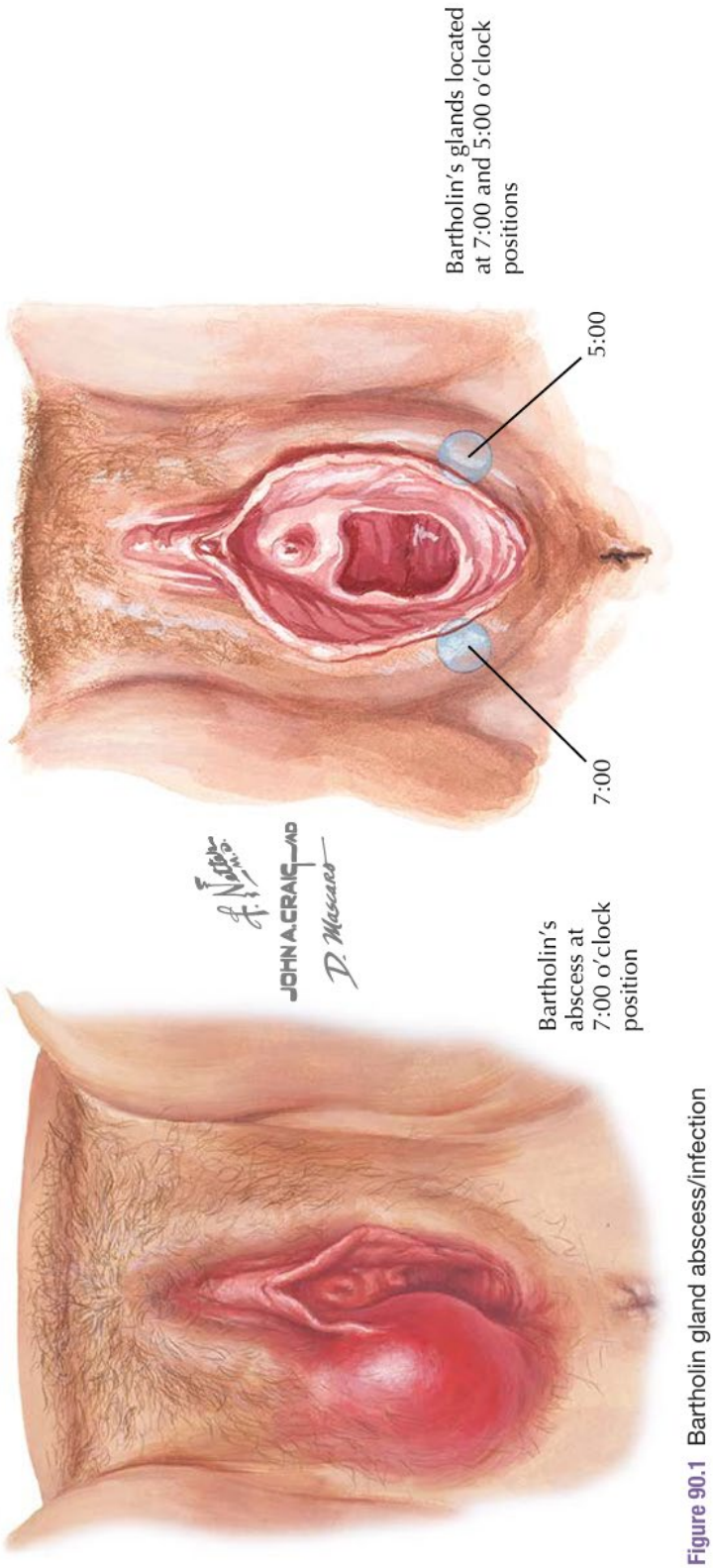

Figure 90.1 Bartholin gland abscess/infection

Figure 5.2. Bartholin's Gland Abscess/Infection

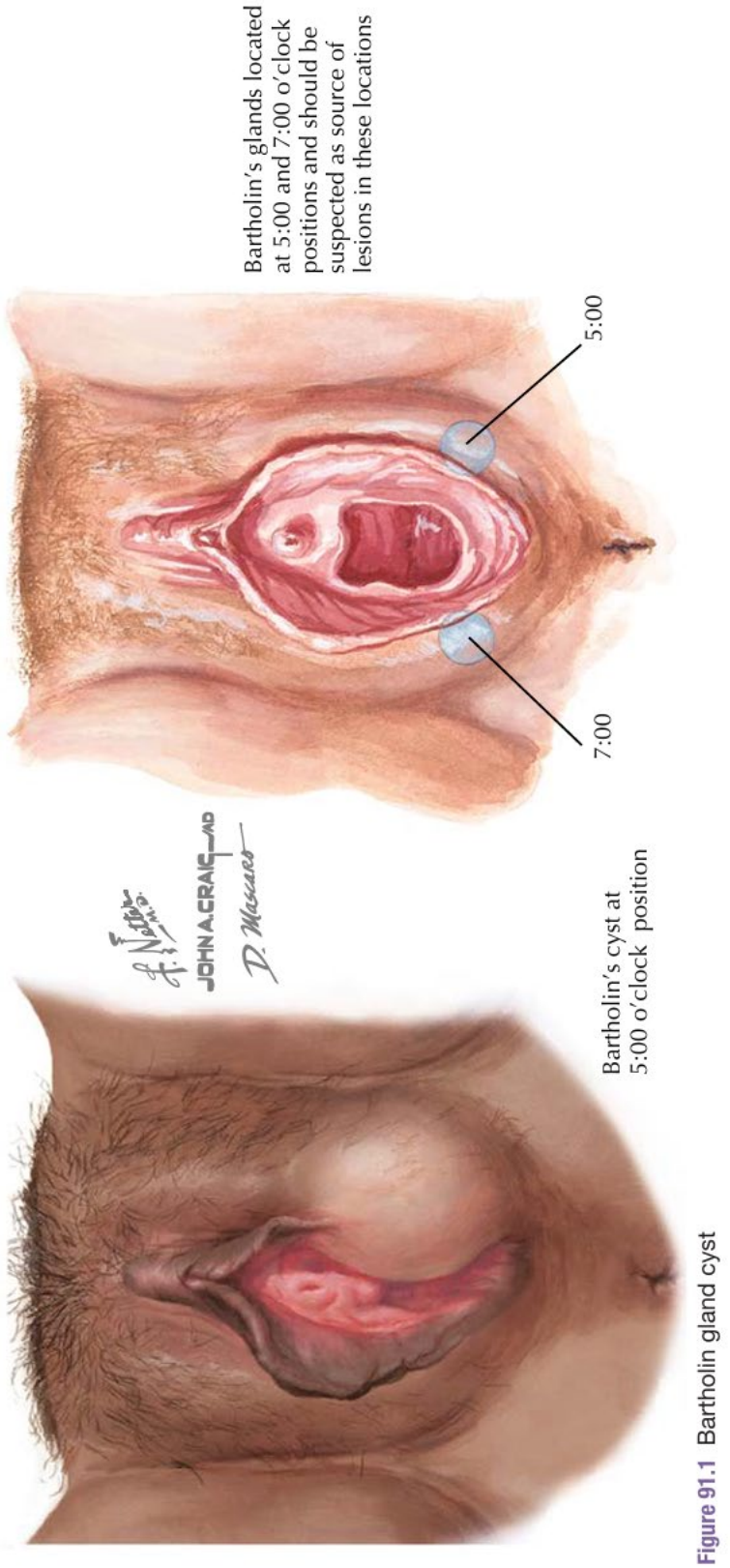

Figure 91.1 Bartholin gland cyst

Figure 5.3. Bartholin's Gland Cyst

2. Pseudoabscess

- Enlargement of the gland to the size of a chicken egg;
- Pain intensifies with movement, sexual intercourse, or sitting;
- Local hyperemia, edema, and tissue tension;
- Body temperature may rise to 38–39 °C, accompanied by chills and general weakness.

3. True Abscess

- Severe pain and pronounced swelling;
- Hectic fever, systemic intoxication, headache;
- On palpation — a fluctuant, extremely tender mass;
- In case of spontaneous rupture — discharge of thick purulent content, after which symptoms rapidly subside.

Without appropriate treatment, the inflammation may subside temporarily but often becomes chronic, characterized by recurrent episodes and the formation of a Bartholin's gland retention cyst.

Differential Diagnosis:
Bartholinitis should be differentiated from:

- Furuncle of the labia majora;
- Gartner's duct cyst;
- Vulvar tumors;
- Inguinal lymphadenitis;
- Tuberculous lesions of the genital organs.

Treatment:

Conservative therapy (in early stages):

- Antibiotics selected based on microbial sensitivity;
- Sulfonamide drugs;

- Sitz baths with potassium permanganate solution (1:6000), chamomile infusion, or antiseptics;
- Local heat (e.g., heating pad, Solux lamp);
- Topical ointment applications (e.g., ichthyol ointment, Vishnevsky ointment);
- Symptomatic treatment — antipyretics, analgesics.

In cases of pseudoabscess or abscess formation:

- Surgical incision and drainage of the abscess;
- In case of recurrence — excision (extirpation) of the Bartholin's gland;
- Physiotherapy: UV therapy, UHF therapy, laser therapy;
- Specific treatment in cases where STIs are identified.

III. Colpitis (Vaginitis)

Colpitis is an inflammation of the vaginal mucosa. It is one of the most common inflammatory conditions affecting women of all age groups, particularly during reproductive and menopausal periods.

Etiology:
Nonspecific colpitis may be caused by opportunistic microorganisms, including *Staphylococcus aureus*, *Escherichia coli*, *Streptococcus spp.*, *Proteus spp.*, and fungi of the genus *Candida*. Mixed microbial infections are frequent, and in some cases, *Trichomonas vaginalis* is detected, which requires the exclusion of a specific infectious process.

Clinical Presentation:

Acute colpitis is characterized by:

- Itching and burning in the vaginal and vulvar area;
- Discomfort during urination;
- Profuse seropurulent or purulent vaginal discharge;
- Hyperemia and edema of the vaginal mucosa on examination;
- Lower abdominal pain in severe cases.

Chronic colpitis presents with milder symptoms. Itching and burning may be absent or mild; discharge is mucopurulent; the vaginal mucosa appears thinned, pale, with possible areas of maceration.

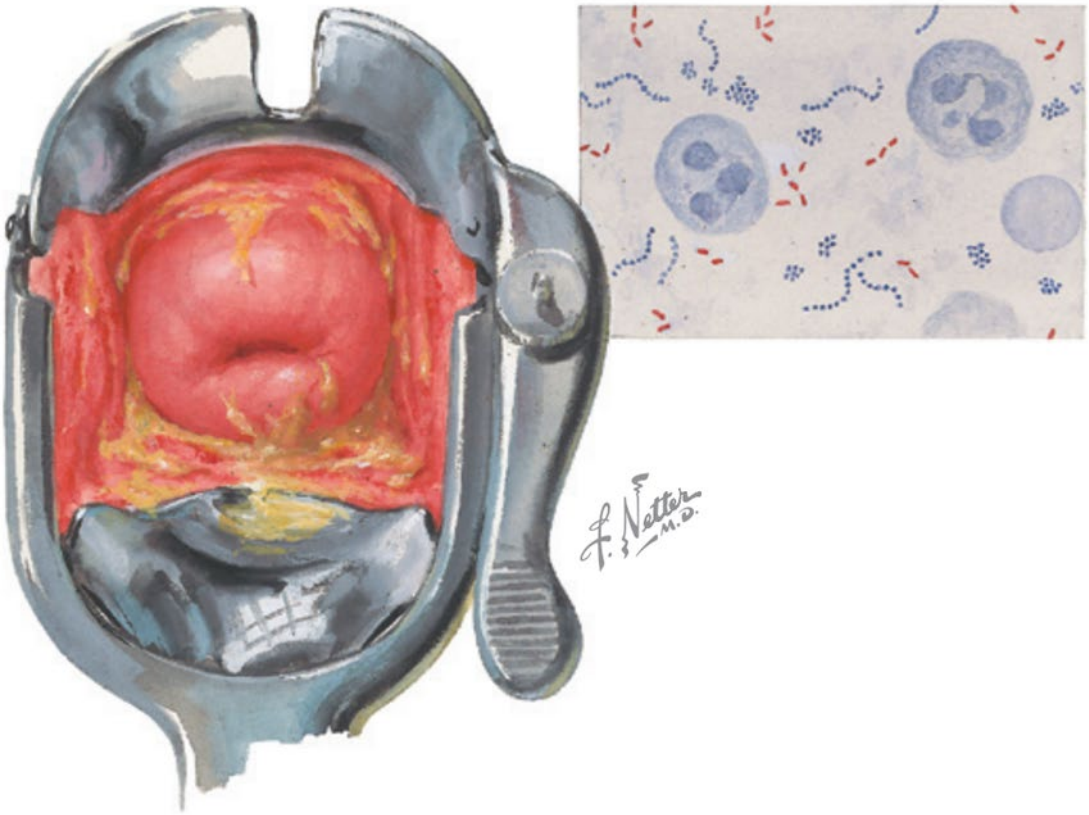

Figure 5.3. Bacterial Vaginitis (Bacterial Colpitis)

Diagnosis:

The diagnosis is based on patient complaints, clinical examination, microscopic analysis of vaginal smears, and bacteriological culture with antibiotic sensitivity testing.

Treatment:

Colpitis therapy includes:

- **General treatment** — addressing underlying conditions (e.g., hormonal disorders, helminthic infections, diabetes, etc.);
- **Local treatment** — vaginal sanitation (douching, antiseptics), vaginal suppositories or creams with antimicrobial, antifungal, or combined action;

- **Antibacterial therapy** — strictly guided by microbial sensitivity results;
- **Physiotherapy** — in cases of chronic colpitis (e.g., laser therapy, UV irradiation);
- **Management of associated conditions** — such as cervicitis, vulvitis, etc., to restore the normal vaginal flora.

IV. Cervicitis

Cervicitis (endocervicitis) is inflammation of the mucosal lining of the cervical canal. It may present in an acute or chronic form.

Etiology:
Causative agents include:

- **Bacteria:** *Staphylococcus spp.*, *Streptococcus spp.*, *Escherichia coli*, *Enterococcus spp.*, *Neisseria gonorrhoeae*;
- **Fungi:** *Candida albicans*;
- **Viruses:** Herpesviruses, Human Papillomavirus (HPV).

A predisposing factor is cervical trauma, particularly during childbirth (e.g., cervical tears, inadequate healing of birth injuries).

Clinical Presentation:

In the acute phase:

- Mucopurulent or purulent vaginal discharge;
- Discomfort, dull pain in the lower abdomen and lumbar region;
- Mild fever;
- On examination — cervical hyperemia, edema, and purulent discharge from the cervical canal.

In the chronic phase:

- Symptoms may be absent;
- Discharge persists as mucous or mucopurulent;
- Prolonged inflammation may lead to cervical hypertrophy and the development of pseudoerosion.

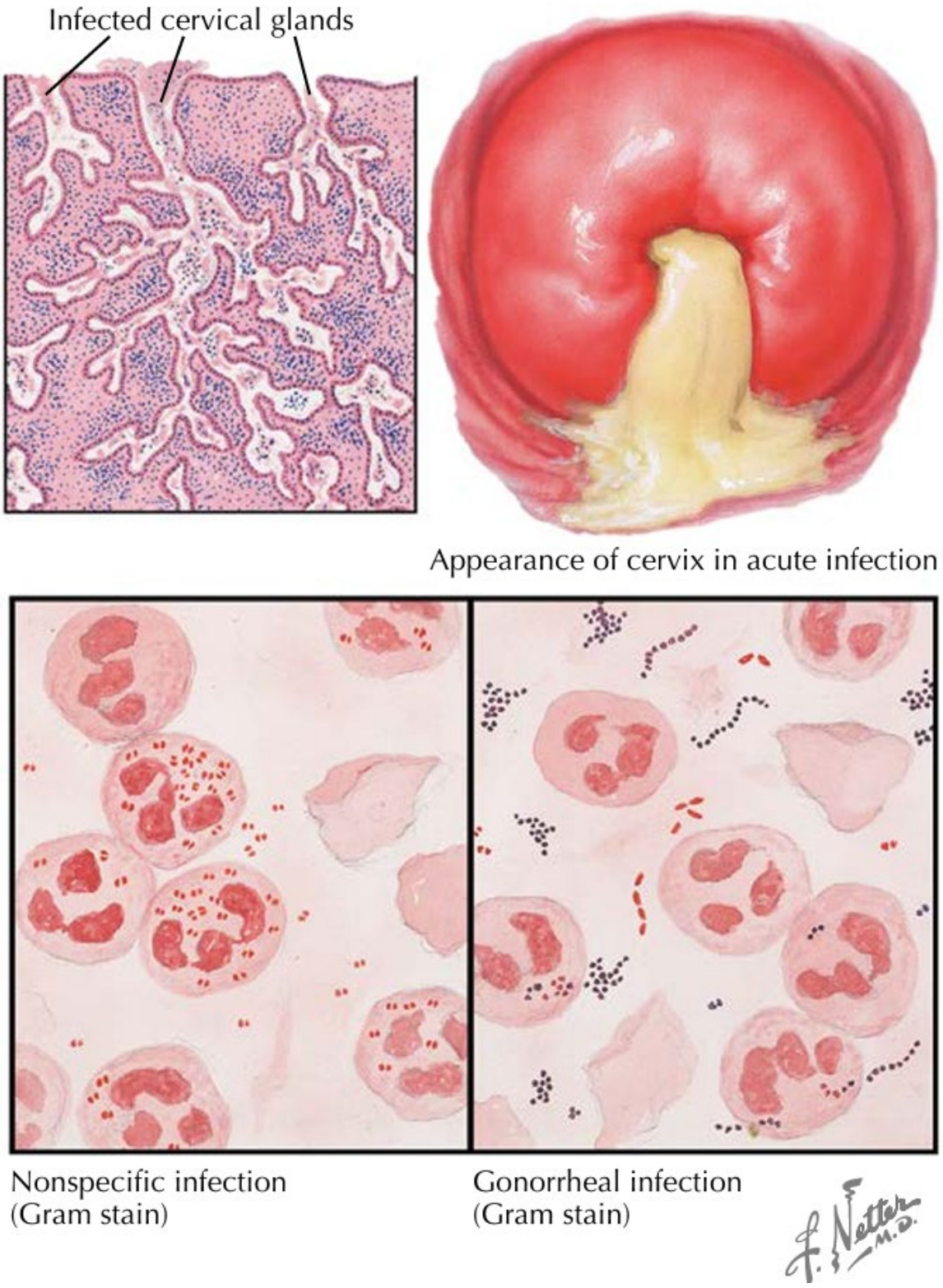

Figure 5.4. Cervicitis

Diagnosis:

Diagnosis includes visual examination, colposcopy, vaginal smears (for flora and degree of cleanliness), PCR testing for sexually transmitted infections (STIs), and bacteriological culture with antibiotic susceptibility testing.

Treatment:

- **Acute stage** — antibacterial therapy based on sensitivity, sulfonamides, local sanitation of the vaginal and cervical area;
- **Chronic form** — physiotherapy, anti-inflammatory vaginal suppositories, vaginal sanitation;
- **In cases of traumatic cervical tears** leading to chronic endocervicitis — surgical correction (cervical plastic surgery) is indicated after inflammation subsides.

Pelvic Inflammatory Diseases (PID)

Pelvic inflammatory diseases involve inflammation of the uterus, fallopian tubes, and the surrounding pelvic tissues. These infections usually result from ascending spread of pathogens from the vagina and cervix.
The main causative agents include aerobic and anaerobic bacteria — *Escherichia coli*, *Staphylococcus spp.*, *Streptococcus spp.*, anaerobes — as well as specific pathogens such as *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Mycoplasma spp.*, and *Ureaplasma urealyticum*, among others.

I. Endometritis

Endometritis is inflammation of the endometrial lining of the uterus. It can be **acute** or **chronic**. Most commonly, it develops following childbirth, abortion, diagnostic curettage, or hysteroscopy.**Etiology:**Causative organisms are typically polymicrobial, most often mixed aerobic-anaerobic flora. In the postpartum period, *Streptococcus pyogenes* (Group A β-hemolytic streptococcus) poses particular risk.

Clinical Presentation:

- **Acute endometritis** is characterized by sudden-onset inflammation of the uterine lining.
- **Chronic endometritis** is a long-standing inflammation of the endometrium and is often associated with infertility.

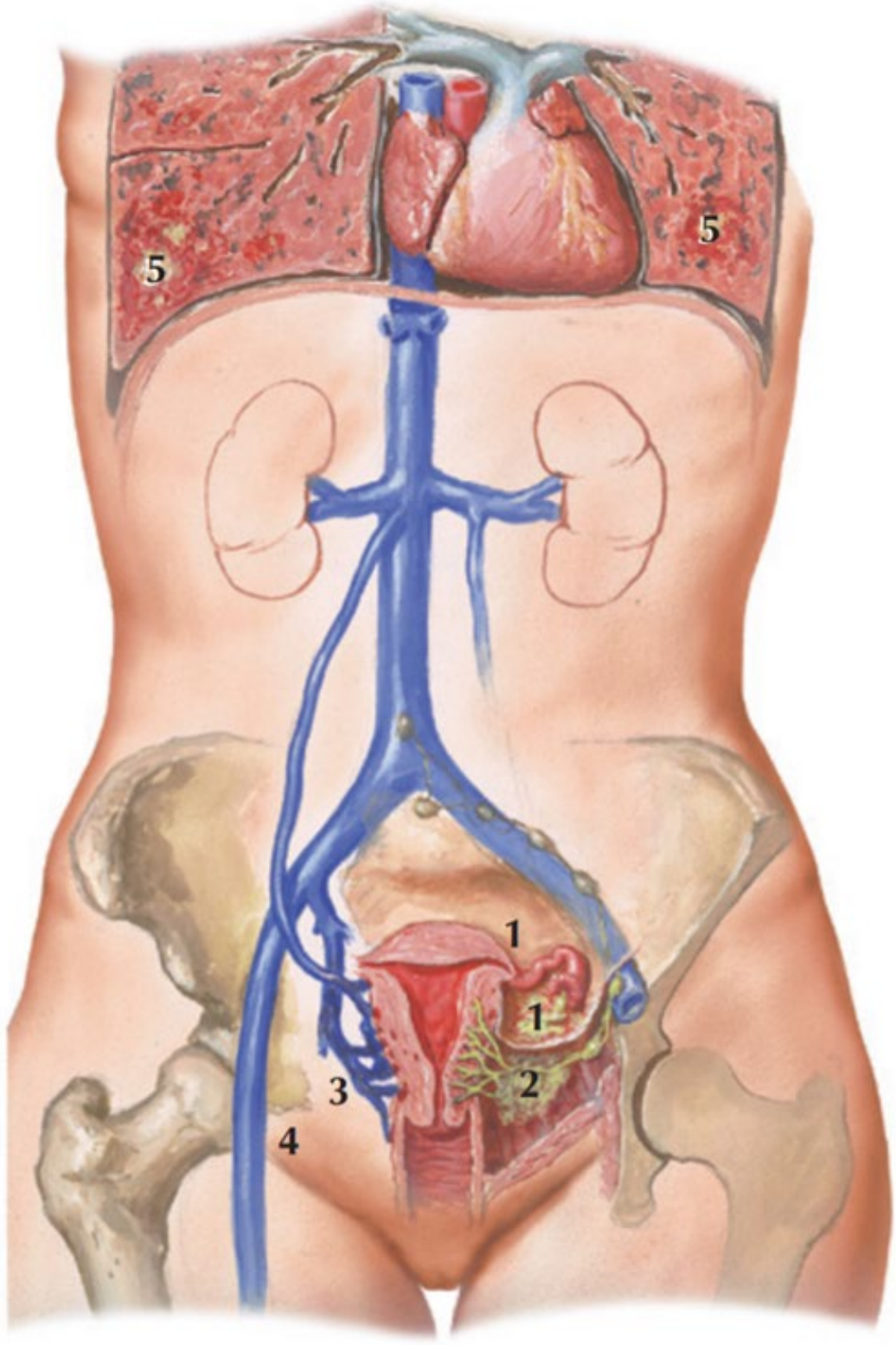

Figure 5.5. Spread of Septic Endometritis: 1 – Peritonitis; 2 – Parametritis (via lymphatic pathways); 3 – Pelvic vein thrombophlebitis; 4 – Femoral vein thrombophlebitis; 5 – Pulmonary infarction or abscess (septic embolism)

Acute Endometritis

- Fever, chills, general weakness
- Cramping lower abdominal pain
- Purulent or seropurulent vaginal discharge
- Uterine tenderness during bimanual examination
- Sometimes uterine subinvolution (in the postpartum period)

Chronic Endometritis

- Scant or prolonged menstruation
- Intermenstrual spotting
- Infertility
- Mild lower abdominal pain

Diagnosis:

- Clinical presentation
- Ultrasound (endometrial thickening, heterogeneity)
- Vaginal smears, PCR for STIs
- Histological examination of the endometrium (in chronic cases)

Treatment:

- Broad-spectrum antibiotic therapy (often in combination)
- NSAIDs (non-steroidal anti-inflammatory drugs)
- Infusion therapy (in acute cases)
- Physiotherapy (in chronic endometritis)

II. Salpingitis and Salpingo-oophoritis

Salpingitis is inflammation of the fallopian tubes. **Salpingo-oophoritis** refers to simultaneous inflammation of the fallopian tubes and ovaries.
The inflammation may be unilateral or bilateral.

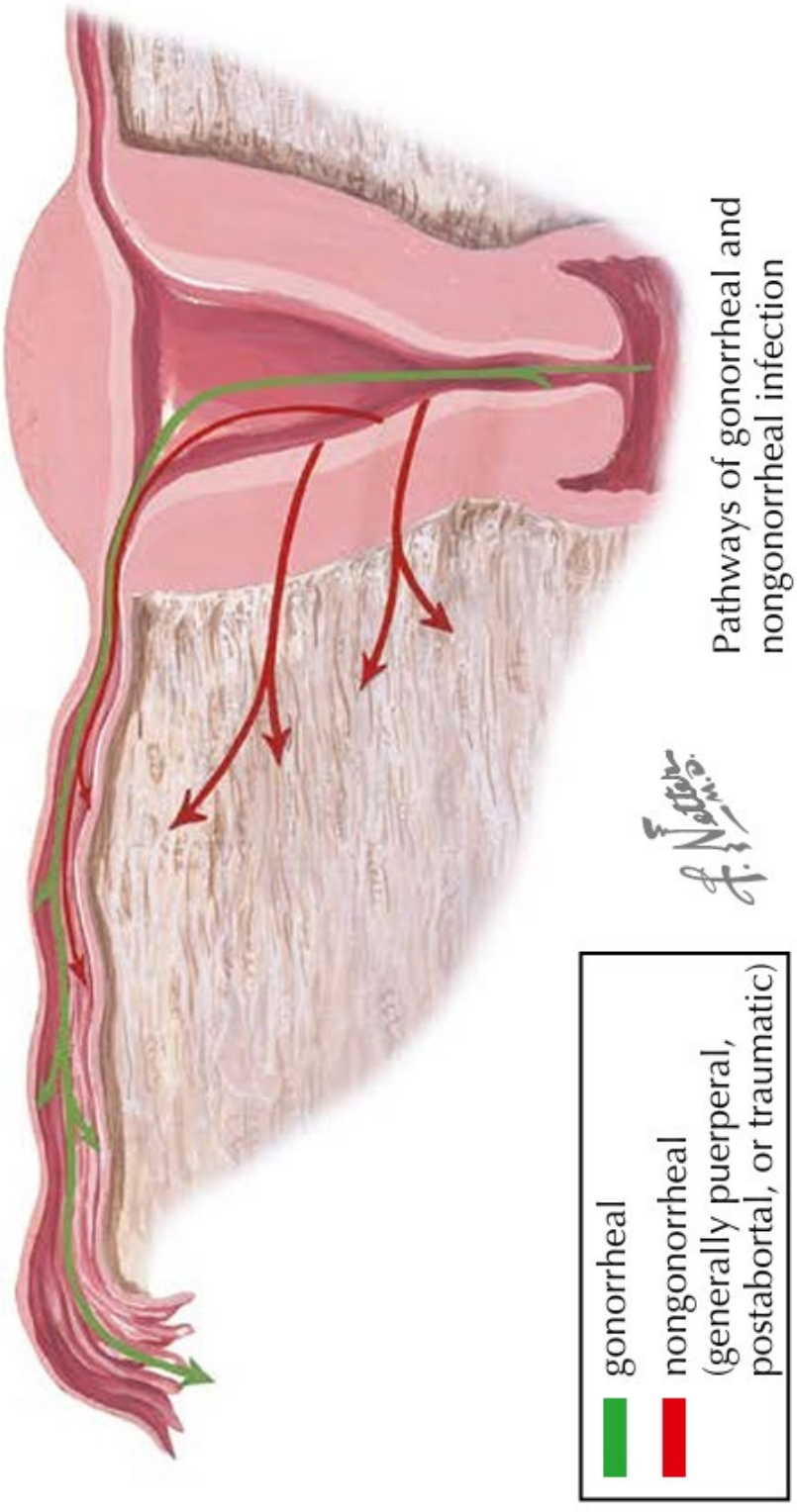

Figure 5.6. Pathways of Infection Spread

Etiology:

As with endometritis, the causative agents are polymicrobial associations, including anaerobic bacteria, *Chlamydia trachomatis*, and *Neisseria gonorrhoeae*.

Clinical Presentation:

Acute Salpingo-oophoritis:

- Lower abdominal pain (unilateral or bilateral)
- Elevated body temperature
- Chills, weakness
- Leucorrhea, dyspareunia, dysuria
- Tenderness and doughy (edematous) adnexal masses on palpation

Chronic Salpingo-oophoritis:

- Persistent or recurrent dull pelvic pain
- Menstrual irregularities
- Tubal infertility
- Chronic pelvic pain syndrome

Complications:

- Tubo-ovarian mass (progression to suppurative inflammation)
- Peritonitis
- Hydrosalpinx
- Tubal infertility

Diagnosis:

- Physical and bimanual pelvic examination
- Pelvic ultrasound
- Laboratory testing (smears, PCR)
- Laparoscopy (if necessary)

Treatment:

- Intravenous antibiotic therapy (in acute cases)
- Analgesics and anti-inflammatory agents
- Physiotherapy during subacute and chronic stages
- Surgical intervention in cases of abscess or complications

III. Parametritis

Parametritis is an inflammation of the parametrial (periuterine) connective tissue. It usually develops as a complication after childbirth, abortion, or surgical procedures involving the cervix or uterine body.

Etiology:
The infection spreads from the uterus or cervix through the lymphatic pathways. The most common pathogens include *Escherichia coli*, *Streptococcus spp.*, *Staphylococcus spp.*, and anaerobic bacteria.

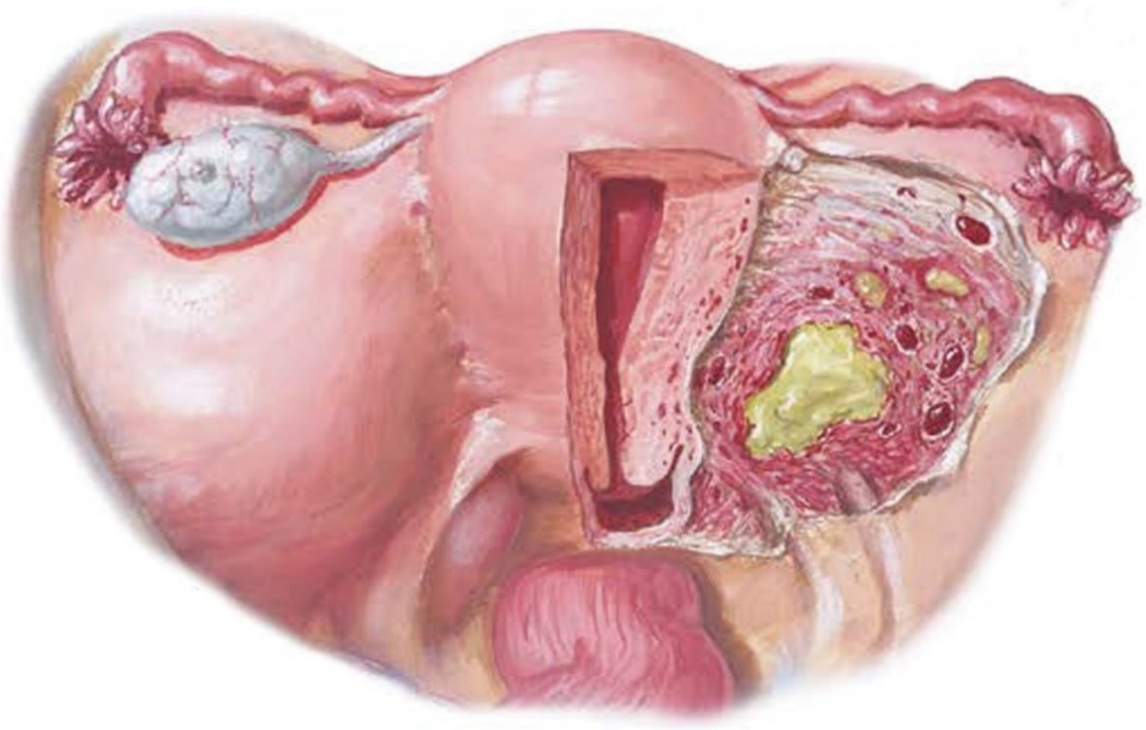

Figure 5.7. Parametritis and Gonococcal/Non-gonococcal Infection.

Clinical Presentation (Parametritis):

- Unilateral lower abdominal pain radiating to the lower back
- Febrile temperature, chills
- Hyperemia and tenderness of the vaginal fornix
- On palpation — a dense infiltrative mass lateral to the uterus
- Dysuria and bowel movement disorders (in cases of extensive inflammation)

Diagnosis:

- Clinical presentation
- Bimanual examination (infiltrate in the parametrial tissue)
- Pelvic ultrasound

Treatment:

- Intensive antibacterial therapy
- Detoxification and infusion therapy
- Analgesics and antipyretics
- Physiotherapy during the subacute stage
- In case of abscess formation — surgical incision and drainage of the parametrial abscess

Vulvovaginitis and Colpitis in Girls During the Hormonal "Neutral Period"

Relevance and Features:

Vulvovaginitis in girls is the most common gynecological condition in childhood, particularly during the so-called hormonal "neutral period" (from 1 year of age to the onset of puberty).
During this phase, the mucous membrane of the genital organs is characterized by physiological hypoestrogenism, which makes it thin, dry, vulnerable, and highly susceptible to infectious agents.

Hormonal deficiency results in poor proliferation of the vaginal epithelium, low glycogen content, absence of normal lactobacilli flora, and lack of an acidic

vaginal environment. These factors facilitate the growth of both opportunistic and pathogenic microorganisms even in response to minimal external stimuli.

Etiology:

Inflammation may be caused by:

- **Opportunistic microorganisms:** *Escherichia coli*, *Staphylococcus aureus*, *Streptococcus spp.*, anaerobic bacteria
- **Fungi:** *Candida* species
- **Helminths:** (e.g., *Enterobius vermicularis*, pinworms)
- **Allergens:** such as soap, synthetic underwear, hygiene products
- **Foreign bodies:** e.g., paper fragments, fabric fibers, etc.
- **Viruses**, and more rarely — **specific pathogens**, particularly in the context of poor hygiene or sexual abuse

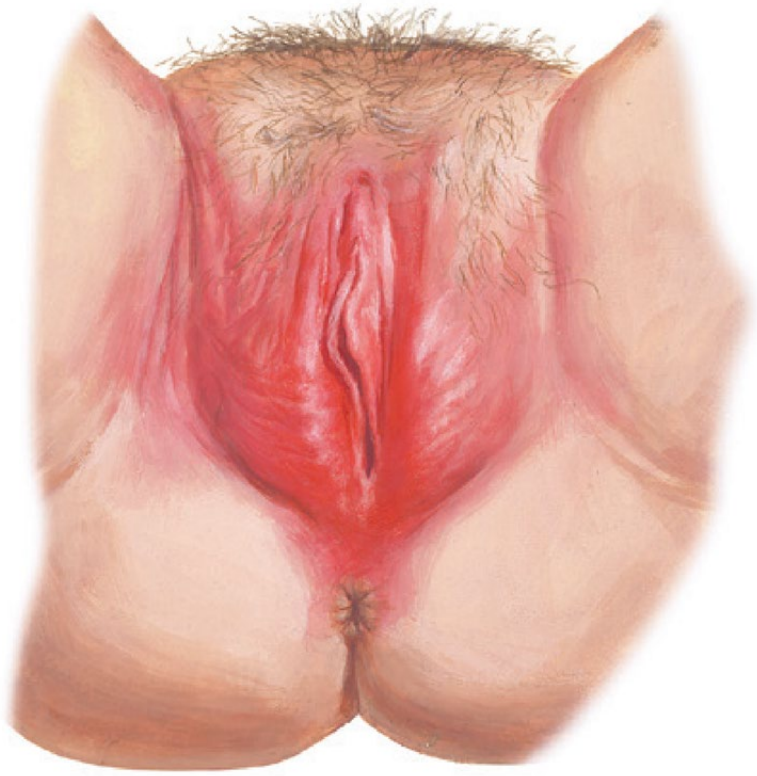

Figure 5.8. Vulvovaginitis

Clinical Presentation:

- Vaginal discharge — serous, mucopurulent, or purulent, often with an unpleasant odor
- Itching, burning, and excoriations in the vulvar area
- Hyperemia and swelling of the vulva and vaginal vestibule
- Painful urination (due to irritation of the external urethral orifice)
- Sleep disturbances, restlessness, refusal to wash due to pain
- On examination — the mucosa is thin, dry, easily traumatized, often with erosions, crusts, and macerated areas

Diagnosis:

Diagnosis is based on:

- Clinical examination
- Microscopy of Gram-stained smears
- Microbiological culture with antibiotic susceptibility testing
- Helminth examination (in suspected enterobiasis)
- Exclusion of specific infections if suspected

Treatment:

Therapy for vulvovaginitis in girls should be gentle, comprehensive, and strictly individualized:

- **Hygienic measures** — daily washing with warm boiled water or herbal decoctions (chamomile, calendula); avoid soaps and fragranced hygiene products
- **Topical therapy** — antiseptic sitz baths, applications with antimicrobial or antifungal ointments (as indicated)
- **Systemic therapy** — antibiotics, antifungal agents, or anthelmintics (according to test results)
- **Sedation and antihistamines** — in cases of intense itching and irritation
- **Physiotherapy** — in chronic or recurrent cases

It is also essential to eliminate predisposing factors: treat dysbiosis, sanitize infection foci, and correct diet and hygiene practices.

Questions for the Chapter

I. Multiple-Choice Questions (Single Best Answer)

1. **Which of the following is NOT considered an inflammatory disease of the upper genital tract?**
   A) Endometritis
   B) Vulvitis
   C) Salpingitis
   D) Parametritis

2. **What type of discharge is characteristic of nonspecific bacterial vaginosis?**
   A) Bloody
   B) Thick, curd-like
   C) Thin, grayish-white
   D) Greenish with odor

3. **What is the main causative agent of acute endometritis?**
   A) Human papillomavirus
   B) Gonococcus
   C) Staphylococcus
   D) Protozoa

4. **What complication most commonly occurs with chronic salpingitis?**
   A) Hydrosalpinx
   B) Uterine rupture
   C) Vaginal atresia
   D) Polyp formation

5. **Which symptom is most characteristic of acute parametritis?**
   A) Itching and burning
   B) Dizziness
   C) Dull lower abdominal pain
   D) Swelling and ulcers on the labia minora

6. **What ultrasound findings are typical in acute endometritis?**
   A) Thickened endometrium with purulent inclusions
   B) Thinned endometrium
   C) Endometrial polyps
   D) No changes

7. **Which microorganisms most commonly cause nonspecific colpitis?**
   A) Gonococci
   B) Escherichia coli and staphylococci
   C) Protozoa
   D) Chlamydia

8. **What complication can develop with acute parametritis?**
   A) Pelvioperitonitis
   B) Uterine aplasia
   C) Hydrosalpinx
   D) Candidal vulvitis

9. **What is the "gold standard" for diagnosing salpingitis?**
   A) Vaginal smear test
   B) Laparoscopy
   C) Pelvic MRI
   D) Urinalysis

II. Open-Ended Questions (Extended Response Tasks)

1. Describe the main etiological factors and pathogenesis of endometritis.
2. What are the symptoms and diagnostic methods characteristic of acute salpingitis?
3. What are the main principles of treatment for nonspecific vulvitis?
4. Describe the clinical picture and complications of parametritis.
5. What preventive measures can be recommended to avoid colpitis in girls during the prepubertal period?

III. Case-Based Clinical Scenarios

Case №1

A 25-year-old woman presents with sharp lower abdominal pain, general weakness, and a fever of up to 38.5°C. She reports purulent vaginal discharge with an unpleasant odor. Her menstrual cycles are regular, but her last period was more painful and heavier than usual. History reveals a medical abortion performed two weeks ago. On examination: tachycardia, uterine tenderness on palpation, and increased uterine size.

1. What is the most likely diagnosis?
2. What diagnostic methods can help confirm the diagnosis?
3. What are the treatment steps?

Case №2

A 10-year-old girl presents with complaints of itching and burning in the external genital area, with worsening discomfort during urination. Her mother reports poor hygiene habits and that the girl often touches her genital area with dirty hands. The child had a recent upper respiratory infection one week ago. On examination: redness and swelling of the labia minora, serous-purulent discharge.

1. What is the preliminary diagnosis?
2. What additional investigations should be performed?
3. What treatment is required?

All supplementary self-assessment materials are available in the Telegram channel:

https://t.me/+_H6LveAOXTw1ZmYy

Or scan the QR code:

Chapter №6. Specific Inflammatory Diseases of the Female Reproductive Organs

Specific inflammatory diseases are infectious processes caused by defined pathogens, predominantly transmitted through sexual contact. Unlike nonspecific inflammations, these conditions have an identifiable causative agent and require etiological (targeted) treatment.

The main infections in this category include: gonorrhea, trichomoniasis, syphilis, chlamydia, mycoplasmosis, ureaplasmosis, candidiasis, and viral infections (including herpes and HPV).

These diseases are characterized by several features: a tendency toward chronic or latent progression, frequent asymptomatic presentation, a high risk of complications affecting reproductive function, and the potential for vertical transmission to the fetus. They represent a significant proportion of gynecological morbidity, especially among women of reproductive age.

I. Gonorrhea

Gonorrhea is a specific infectious disease caused by the gram-negative diplococcus *Neisseria gonorrhoeae* (gonococcus). It is primarily sexually transmitted but can also be passed vertically from mother to newborn or, in girls, via indirect household contact with contaminated personal hygiene items.

This infection is classified among sexually transmitted infections (STIs) and is known for its tendency toward chronicity, latency, and a wide range of complications, particularly affecting the reproductive system.

Etiology and Epidemiology

The causative agent, *Neisseria gonorrhoeae*, is highly contagious, resistant to mucosal defense mechanisms, replicates rapidly, and easily invades the epithelial cells of the urogenital tract.

The incubation period in women averages 5–10 days but can vary. Gonorrhea remains highly prevalent in many countries, particularly among young women under the age of 25. Coinfections with *Chlamydia trachomatis*, *Ureaplasma urealyticum*, and *Trichomonas vaginalis* are commonly observed.

Pathogenesis

Gonococci invade the columnar epithelium of the cervical canal, urethra, vaginal glands, Bartholin's and paraurethral glands. Local inflammation develops at the site of entry, accompanied by purulent discharge.
The infection may ascend to the uterus, fallopian tubes, and peritoneal cavity, resulting in salpingitis, pelvic peritonitis, and parametritis.
If the infection becomes systemic, complications may include gonococcal sepsis, arthritis, endocarditis, and meningitis.

Clinical Presentation

In women, gonorrhea is often asymptomatic or manifests with minimal symptoms, contributing to chronic progression and unnoticed transmission.

Acute gonococcal cervicitis is the most common form and presents with:

- Profuse purulent or yellowish vaginal discharge
- Redness and swelling of the cervix
- Contact bleeding (e.g., after sexual intercourse)

Gonococcal urethritis may cause:

- Burning and pain during urination
- Frequent urge to urinate
- Discharge from the external urethral orifice

Ascending gonococcal infection may present with:

- Lower abdominal pain
- Fever, signs of systemic intoxication
- Dyspareunia, menstrual irregularities
- In some cases, pelvic peritonitis

In newborns, gonococcal conjunctivitis may develop, which can lead to blindness if untreated.

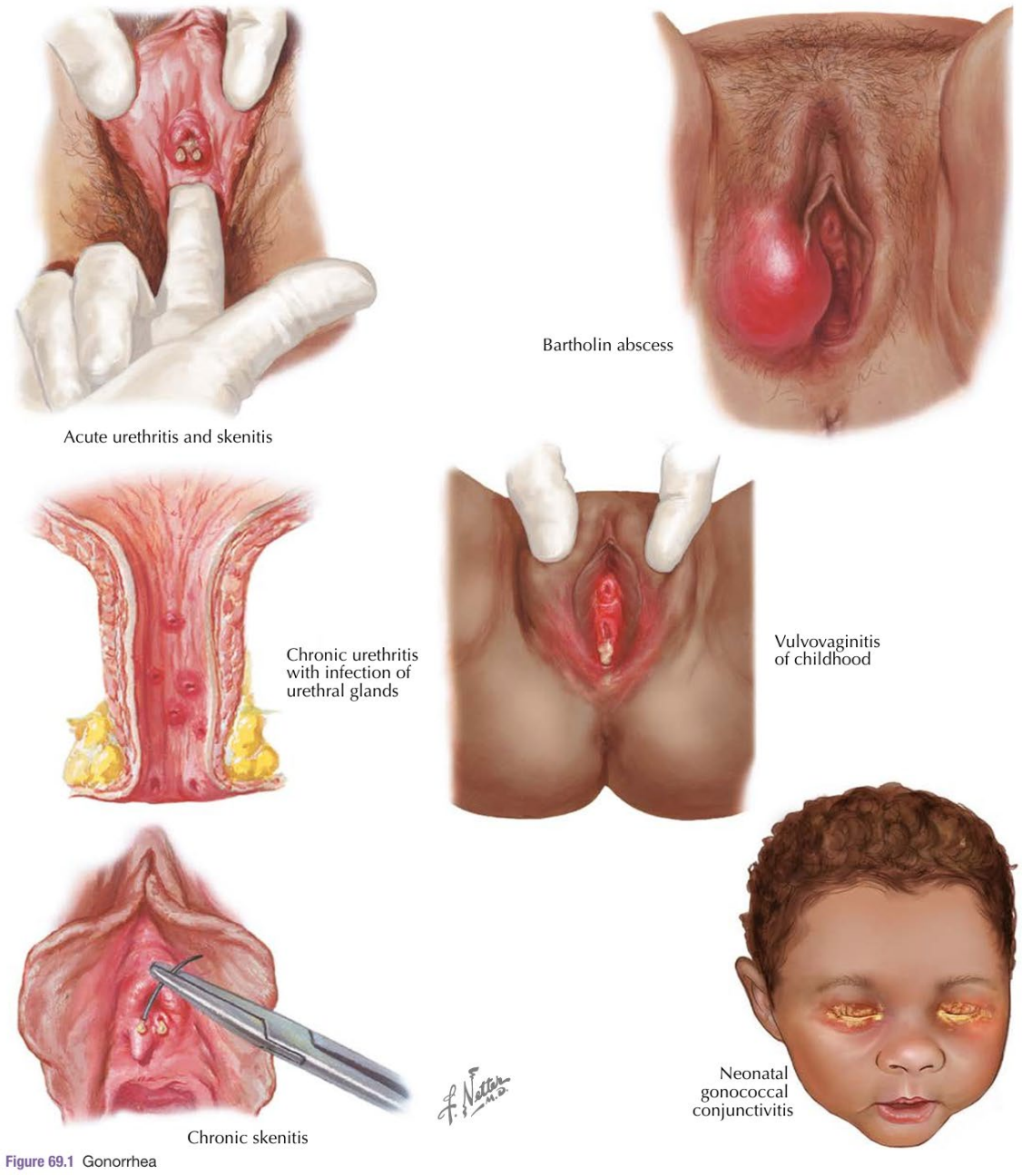

Figure 6.1. Gonorrhea

Diagnosis

1. **Smear microscopy** — identification of intracellular, kidney-shaped diplococci stained by Gram stain (typical of acute infection);
2. **Bacteriological culture** — the primary method, especially for chronic and mixed infections;
3. **PCR diagnostics** — a highly sensitive method for detecting *Neisseria gonorrhoeae* DNA;

4. **ELISA, immunofluorescence (IFA), and culture methods** — used in cases of diagnostic difficulty;
5. **Partner testing** is mandatory, even in asymptomatic cases.

Complications

- Ascending infection (endometritis, salpingitis, salpingo-oophoritis);
- Tubal infertility;
- Ectopic pregnancy;
- Chronic pelvic pain syndrome;
- Fetal and neonatal infection;
- Sepsis, arthritis, and mucocutaneous manifestations in disseminated cases.

Treatment

The drugs of choice are **third-generation cephalosporins**, often in combination with treatment for co-infections (most commonly *Chlamydia trachomatis*).

- **Ceftriaxone** 500–1000 mg intramuscularly, single dose;
- In cases of **chlamydial co-infection**, add **azithromycin** 1 g orally, single dose.

In cases of **allergy or intolerance**, spectinomycin or carbapenems may be used.

In **chronic forms**, treatment includes courses of antibacterial therapy combined with physiotherapy, immunomodulation, and local sanitation.

Prevention

- Use of barrier contraceptives (e.g., condoms);
- Regular screening, especially in women with multiple partners;
- Simultaneous treatment of both sexual partners;
- Follow-up and microbiological test-of-cure 2–4 weeks after therapy.

II. Trichomoniasis

Trichomoniasis is a specific infectious-inflammatory disease of the urogenital tract caused by the protozoan parasite *Trichomonas vaginalis*. It is classified as a

sexually transmitted infection (STI) and is characterized by involvement of the vagina, urethra, cervix, and, in some cases, other parts of the genitourinary system.

Etiology and Epidemiology

The causative agent — *Trichomonas vaginalis* — is an anaerobic, flagellated protozoan capable of active motility, epithelial invasion, and triggering inflammation.
Trichomonas survives well in moist environments but quickly dies when dried or exposed to temperatures above 40 °C.

Infection is typically **sexually transmitted**. **Household transmission** is possible but extremely rare.
Trichomoniasis is one of the **most common STIs**, with significantly higher incidence among women than men, particularly in the **20–45 age group**.

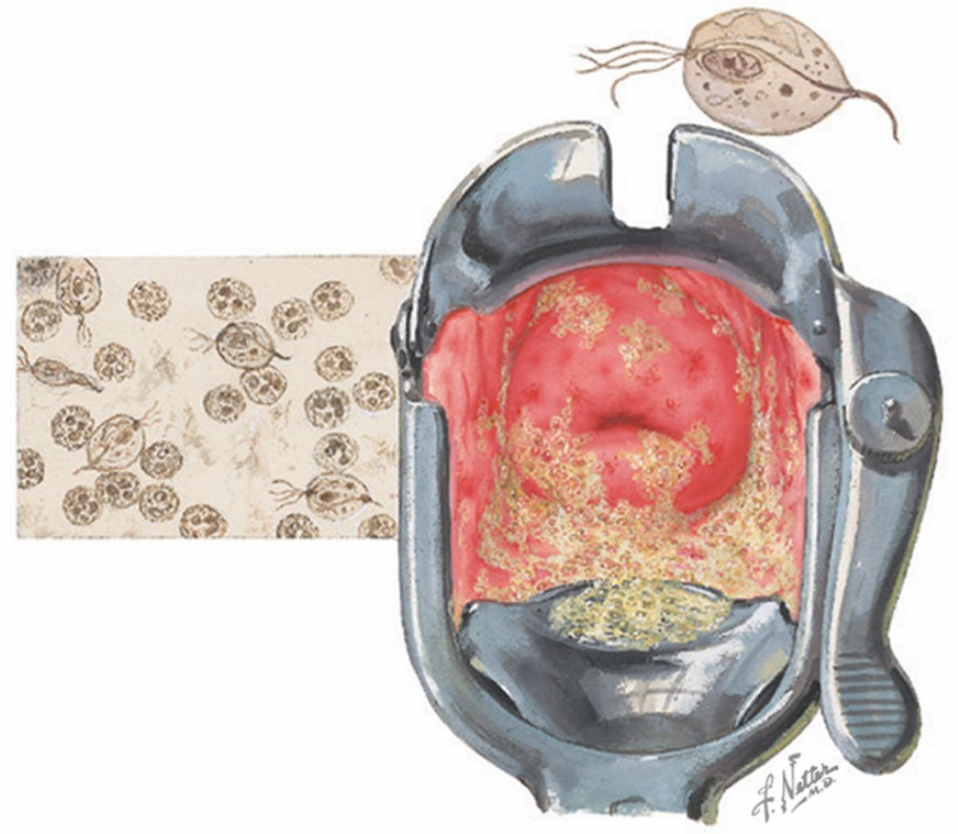

Figure 6.2. Trichomoniasis

Upon reaching the mucous membranes of the genital tract, *Trichomonas vaginalis* attaches to epithelial cells, secretes enzymes (hyaluronidase, proteases), and disrupts intercellular junctions, leading to inflammation, edema, and irritation.

This triggers a local immune response, exudate formation, and disruption of the normal vaginal microbiota. The infection may persist for a long time, especially in the presence of other STIs (e.g., chlamydia, gonorrhea) or in cases of immunosuppression.

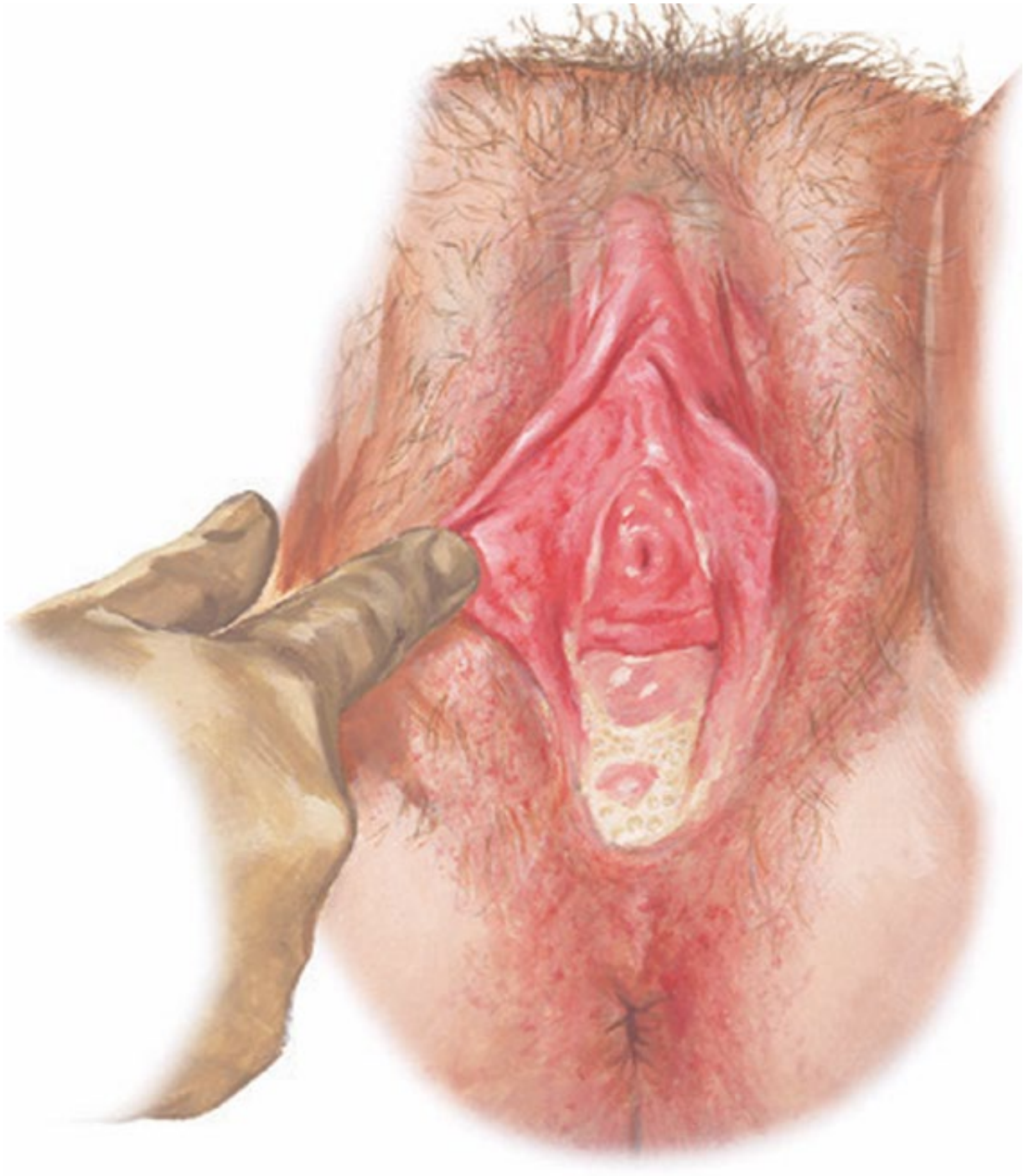

Figure 6.3. Status localis in Trichomoniasis

Clinical Presentation

In women:

- Profuse, frothy, gray-green or yellowish vaginal discharge with a strong, unpleasant odor
- Vaginal and vulvar itching and burning
- Dysuria (burning, frequent urination)
- Dyspareunia (pain during sexual intercourse)
- Hyperemia and swelling of the external genitalia
- Cervical erosion and contact bleeding may also be present

In men:
Often asymptomatic; may present as urethritis, and less commonly — prostatitis or epididymitis

Diagnosis

- **Microscopy of a wet mount preparation** — detects motile *Trichomonas* organisms
- **Stained smears** (Gram, Romanowsky stains)
- **Culture method** (growth on specialized media) — used when microscopy sensitivity is low
- **PCR testing** — highly sensitive and specific for detecting *T. vaginalis* DNA
- **Mandatory testing and treatment of both sexual partners**

Complications

- Chronic vaginitis
- Cervicitis, endometritis
- Ascending infections: salpingitis, oophoritis
- Tubal infertility
- Chronic pelvic pain syndrome
- Increased risk of acquiring HIV and other STIs

Treatment

Antiprotozoal agents are the cornerstone of therapy:

- **Metronidazole** — 2 g orally as a single dose, or 500 mg twice daily for 7 days
- **Tinidazole, Ornidazole** — alternative treatment options
- **Topical therapy** (vaginal suppositories or tablets) — as an adjunct to systemic treatment

Sexual activity should be avoided during treatment. **Both partners must be treated**, and alcohol should be strictly avoided (due to disulfiram-like reaction).

Prevention

- Condom use during sexual intercourse
- Regular screening and simultaneous treatment of partners
- Personal hygiene
- Limiting the number of sexual partners
- Dispensary observation in cases of chronic trichomoniasis

III. Chlamydia Infection (Chlamydiosis)

Chlamydiosis is a specific infectious disease of the genitourinary system caused by the intracellular parasite *Chlamydia trachomatis*. It is one of the most prevalent sexually transmitted infections (STIs) and is characterized by an asymptomatic or minimally symptomatic course, a strong tendency to become chronic, and significant reproductive health risks.

Etiology and Epidemiology

The causative agent, *Chlamydia trachomatis*, is an **obligate intracellular microorganism** that exhibits characteristics of both bacteria and viruses. It has the ability to persist for prolonged periods within the cells of the urogenital epithelium, leading to chronic inflammation.Transmission occurs primarily through sexual contact, and **vertical transmission** from mother to child during childbirth is also possible. Chlamydial infection is among the **most widespread STIs globally**, particularly in individuals under the age of 25.

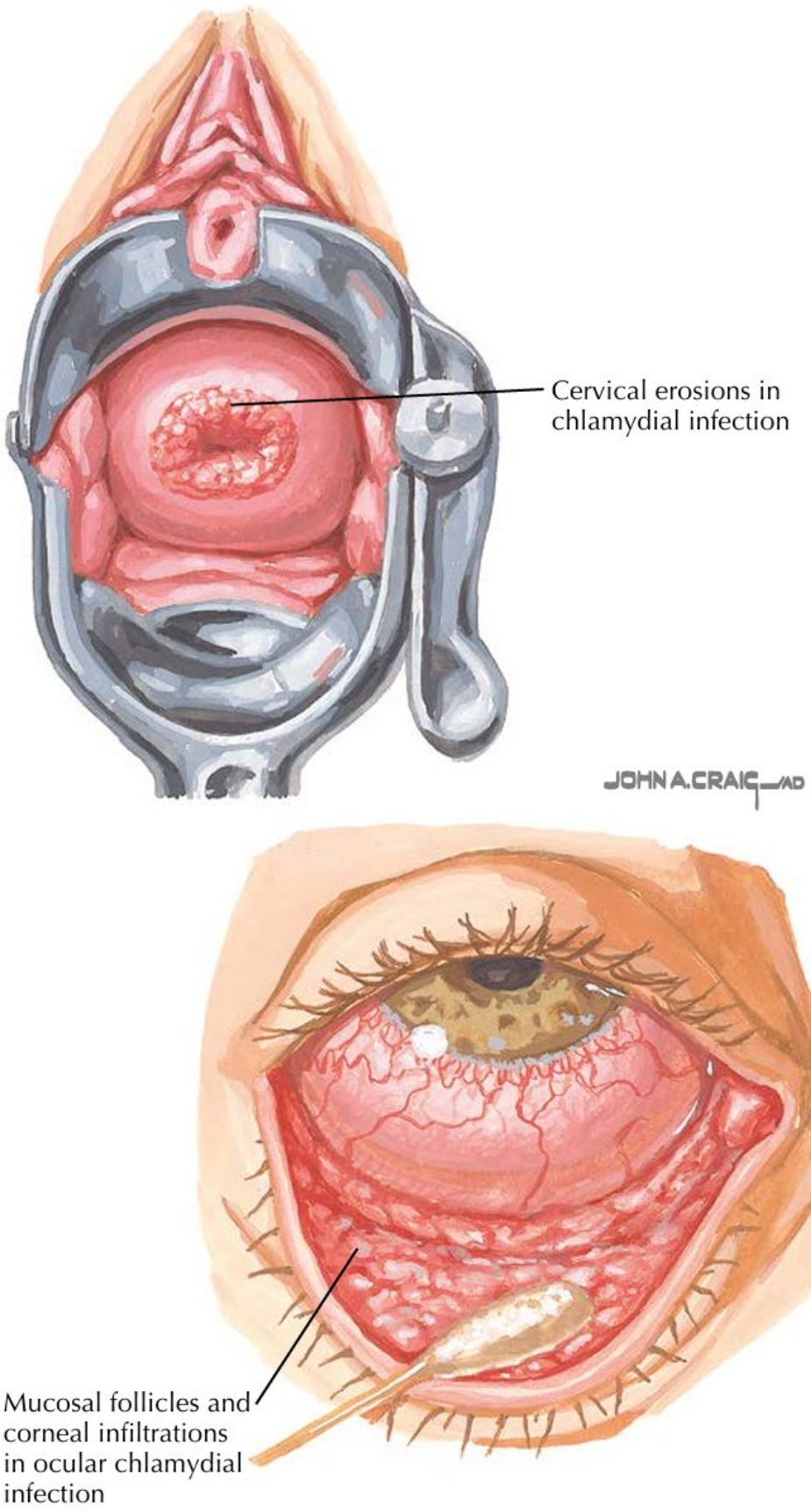

Figure 6.4. Chlamydiosis

Pathogenesis

After penetrating the epithelial cells of the cervical canal, urethra, endometrium, fallopian tubes, or rectum, *Chlamydia trachomatis* begins to replicate, destroying the host cells and provoking inflammation.
A key feature of chlamydia is its ability to persist for long periods and cause both acute and chronic inflammatory processes.

Chlamydial infection compromises immune defenses, promotes the development of ascending infections, tuboperitoneal infertility, adhesive disease, and increases the risk of ectopic pregnancy.

Clinical Presentation

In women, chlamydial infection is often asymptomatic (up to 70% of cases) or manifests with mild, nonspecific symptoms:

- Scant mucopurulent or yellowish discharge
- Itching, burning, and vaginal discomfort
- Dysuria and symptoms of urethritis
- Dull lower abdominal pain
- Intermenstrual spotting
- Dyspareunia (painful sexual intercourse)

If the infection becomes chronic, it may progress to cervicitis, endometritis, salpingitis, and infertility.

Diagnosis

- **PCR (Polymerase Chain Reaction)** — the "gold standard," offering high sensitivity and specificity for detecting *Chlamydia* DNA
- **ELISA (Enzyme-Linked Immunosorbent Assay)** — detects antibodies, but is of limited value in acute infections
- **Culture for *Chlamydia*** — rarely used due to technical complexity
- **Microscopy** — low sensitivity and limited diagnostic value
- **Partner screening is mandatory**, as infections in both partners are often asymptomatic

Complications

- Chronic endometritis
- Salpingo-oophoritis (inflammation of fallopian tubes and ovaries)
- Chronic pelvic pain syndrome
- Tubal infertility
- Ectopic pregnancy
- **Reiter's syndrome** in men — urethritis, conjunctivitis, arthritis
- **Chlamydial infection in newborns** — conjunctivitis, pneumonia

Treatment

First-line medications:

- **Azithromycin** 1 g orally, single dose
- or **Doxycycline** 100 mg twice daily for 7 days
- **Alternative agents**: Ofloxacin, Erythromycin, Clarithromycin

Both sexual partners must be treated!
Sexual intercourse is prohibited during treatment and until negative follow-up tests are confirmed.
If co-infection with other STIs (e.g., gonorrhea, mycoplasma) is present — **combination therapy** is required.

Prevention

- Use of **barrier contraception** (e.g., condoms)
- Regular screening when engaging with new sexual partners
- Follow-up care by a gynecologist and dermatovenerologist
- Timely detection and treatment of infection sources
- **Prevention of vertical transmission** — chlamydia screening during pregnancy

IV. Genital Candidiasis

Definition

Genital candidiasis is an inflammatory disease of the mucous membranes of the genital organs caused by yeast-like fungi of the genus *Candida*, most commonly *Candida albicans*. It is classified as an **opportunistic infection** and may occur as an isolated pathology or as part of a mixed infection.

Candidiasis frequently develops in the context of **local or systemic immune suppression** and tends to recur, especially in women of reproductive age.

Etiology and Epidemiology

The primary causative agent is *Candida albicans*, although other species such as *C. glabrata*, *C. tropicalis*, and *C. parapsilosis* can also be responsible. These yeast-like fungi may be present as **commensals** on the vaginal mucosa without causing symptoms.

Triggering factors for disease development include:

- Antibiotic therapy (disruption of the vaginal microbiota)
- Hormonal changes (pregnancy, menopause)
- Endocrine disorders (e.g., diabetes mellitus)
- Immunodeficiency conditions
- Use of synthetic underwear or aggressive hygiene products
- Frequent vaginal douching

Genital candidiasis often occurs in sexually active women, but it is **not classified as a traditional sexually transmitted infection (STI).**

Pathogenesis

When microbial balance is disrupted and local immune defenses are weakened, *Candida* species begin to actively proliferate, invade the superficial layers of the epithelium, and induce an inflammatory response.

The resulting inflammation increases vascular permeability and exudation, leading to **typical discharge and itching**. Edema, tissue maceration, and compromised mucosal barrier function follow.

Clinical Presentation

Acute form:

- Intense itching and burning in the vulvar and vaginal area
- Profuse white, curd-like (cottage cheese-like) discharge, odorless or with a sour odor
- Redness, edema, and maceration of the mucosa
- Pain during intercourse (dyspareunia) and urination (dysuria)
- Symptom exacerbation prior to menstruation

Chronic (recurrent) candidiasis:

- Milder symptoms
- Recurrence more than 4 times per year
- Often associated with other inflammatory genital diseases

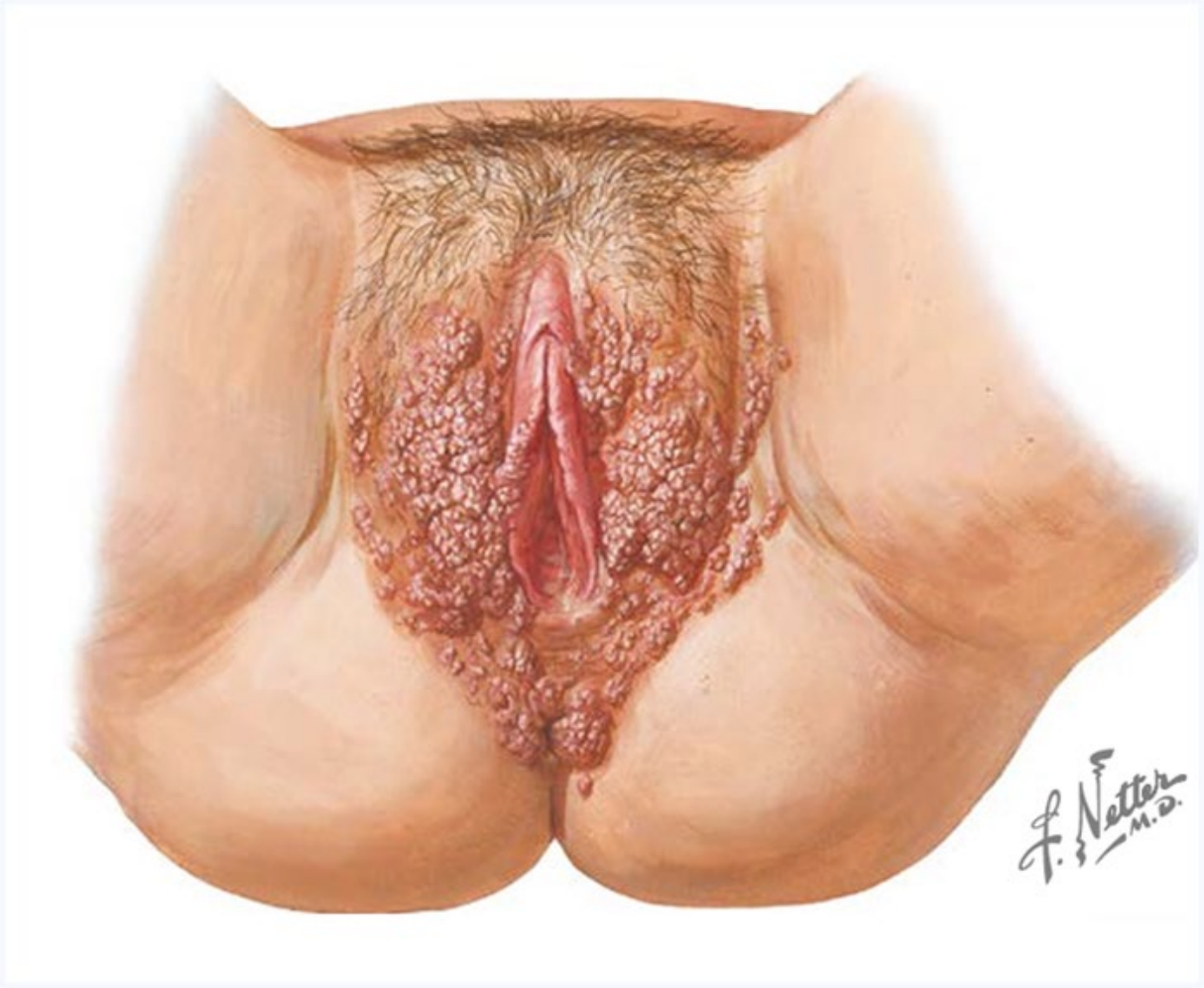

Figure 6.5. Genital Candidiasis

Diagnosis

- **Clinical examination** — typical presentation with curd-like discharge and mucosal hyperemia
- **Microscopy of vaginal smears** — detection of fungal spores and hyphae
- **Culture with antifungal susceptibility testing**
- **PCR diagnostics** — used in atypical or unclear cases
- **Screening for concomitant STIs** — if mixed infection is suspected

Complications

- Recurrent course
- Chronic vulvovaginitis
- Secondary bacterial infection
- Decreased quality of life and sexual dysfunction
- In pregnancy — risk of neonatal infection (*e.g.*, oral thrush, diaper dermatitis, ocular or umbilical candidiasis)

Treatment

Local therapy:

- Vaginal suppositories, tablets, or creams containing **clotrimazole**, **natamycin**, **miconazole**, or **nystatin**

Systemic therapy:

- **Fluconazole 150 mg orally once** (for uncomplicated cases)
- In **chronic candidiasis** — repeated regimens (e.g., 150 mg once weekly for 1 month)
- **Itraconazole** or **ketoconazole** may be used in cases of recurrence or antifungal resistance

In patients with **underlying conditions** (e.g., diabetes, hormonal disorders, dysbiosis), it is essential to treat the primary disease.

Prevention

- Maintaining intimate hygiene (without excessive interventions)
- Wearing cotton underwear; avoiding overheating and moisture
- Avoiding unnecessary use of antibiotics and hormonal medications
- Managing underlying medical conditions
- Using **probiotics** after antibiotic therapy
- Eliminating recurrence-provoking factors (stress, allergens, high-sugar diets)

V. Genital Herpes

Definition

Genital herpes is a **chronic, recurrent viral disease** primarily transmitted through sexual contact and caused by **herpes simplex virus (HSV)** — most often type 2 (HSV-2), less commonly type 1 (HSV-1). It is characterized by lesions of the skin and mucous membranes of the genital area, including vesicles, erosions, itching, burning, and systemic symptoms.
The disease is **highly contagious** and known for its ability to **persist in a latent form** over a lifetime.

Etiology and Epidemiology

The causative agent is the **herpes simplex virus (HSV)**, predominantly **type 2 (HSV-2)**, and less commonly **type 1 (HSV-1)**.
The source of infection is an infected person or asymptomatic carrier.

Modes of transmission:

- **Sexual contact** (including oral-genital transmission)
- **Vertical transmission** from mother to child during childbirth
- **Household contact** is possible but extremely rare

Incubation period: 2 to 12 days
The **highest prevalence** is observed among **women of reproductive age**.

Pathogenesis

After initial exposure, the virus enters **sensory neurons** and migrates to the **sacral dorsal root ganglia**, where it remains in a **latent state for life**.

Reactivation can occur under conditions of reduced immunity or triggers such as stress, hypothermia, menstruation, or concurrent infections.

The viral replication cycle causes **cytopathic damage** to epithelial cells, leading to **inflammation, pain, and tissue destruction**.

Clinical Presentation

Primary episode:

- General malaise, fever, headache
- Pain, swelling, and redness in the genital area
- Clusters of **clear vesicles** on the skin and mucosa, which rapidly rupture to form erosions
- Severe itching, burning, dysuria, and pain during intercourse
- Enlarged and tender inguinal lymph nodes
- Vaginal discharge (serous or mucopurulent)

Recurrent form:

- Milder symptoms
- Localized itching, tingling, and single vesicular lesions
- Tendency for **frequent recurrences**, often triggered by menstruation, viral infections, or stress

Diagnosis

- **Clinical signs** — typical vesicular lesions and characteristic localization
- **PCR testing** — highly sensitive for detecting HSV DNA
- **Serological tests (ELISA)** — detection of **IgM** (acute infection) and **IgG** (past infection) antibodies
- **Viral culture** — rarely used in routine practice
- **Cytology** — detection of multinucleated giant cells (low sensitivity and specificity)

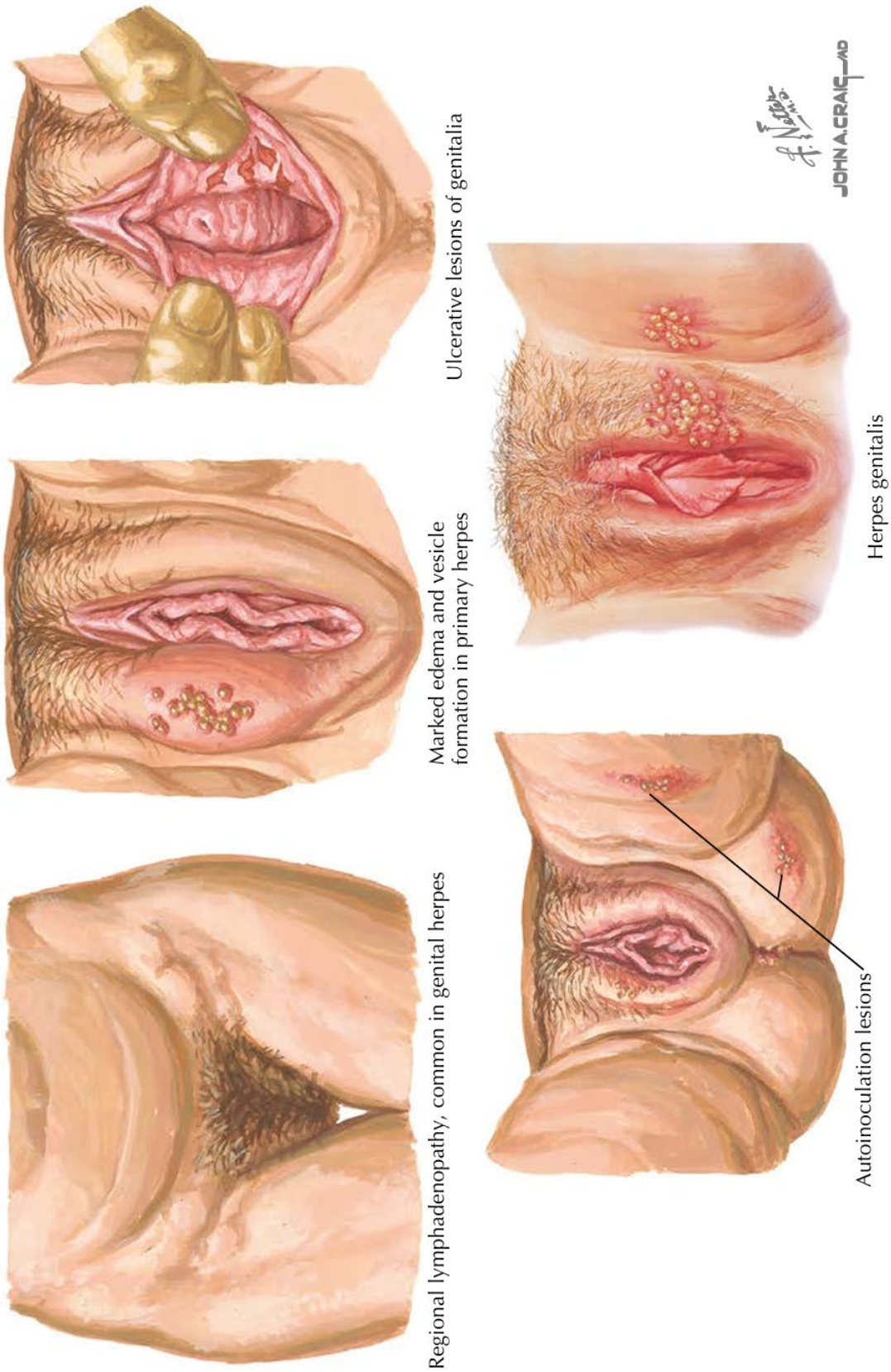

Figure 6.6. Herpes Simplex Lesions

Complications

- Chronic course with frequent recurrences
- Secondary bacterial infection
- Psychological distress and sexual dysfunction
- Dissemination of infection to other organs (e.g., eyes, central nervous system)
- **Intrauterine fetal infection** during a **primary episode in pregnancy**
- **Neonatal herpes sepsis** in newborns (especially dangerous if childbirth occurs during an active outbreak)

Treatment

Etiotropic (antiviral) therapy:

- **Acyclovir** 400 mg orally, 3 times daily for 7–10 days
- **Valacyclovir** 500 mg twice daily
- **Famciclovir** — an alternative agent

In **recurrent genital herpes**, **suppressive therapy** may be considered:

- **Acyclovir** 400 mg twice daily for up to 6 months
- **Maintenance therapy** is recommended for immunocompromised patients

Additional measures:

- Topical antiviral ointments (e.g., acyclovir, panavir)
- Analgesics, antiseptic sitz baths
- Immunomodulatory agents — prescribed on an individual basis

Prevention

- Use of **condoms** (reduces risk, but does not provide complete protection)
- **Abstaining from sexual activity during outbreaks**
- Avoiding sexual contact with partners who have visible lesions
- Careful **management of pregnant women** with HSV infection to prevent fetal transmission

- **There is currently no approved vaccine** against HSV

Questions for the Chapter

I. Multiple-Choice Questions (Single Best Answer)

1. **Which of the following pathogens causes gonorrhea?**
   A) *Neisseria gonorrhoeae*
   B) *Trichomonas vaginalis*
   C) *Chlamydia trachomatis*
   D) *Mycoplasma genitalium*

2. **What is the main diagnostic method for genital herpes?**
   A) Pelvic ultrasound
   B) Microscopic smear examination
   C) PCR for herpes virus detection
   D) Vaginal flora culture

3. **Which symptom is characteristic of trichomoniasis?**
   A) Frothy yellow discharge
   B) Cottage cheese-like discharge
   C) Watery discharge without odor
   D) Absence of discharge

4. **Which of the following is NOT a complication of urogenital chlamydia?**
   A) Infertility
   B) Fitz-Hugh–Curtis syndrome
   C) Spontaneous abortion
   D) Development of cancer

5. **Which disease may develop in ascending gonorrhea?**
   A) Cervicitis
   B) Salpingitis
   C) Bartholinitis
   D) Parametritis

6. **What determines the pathogenicity of mycoplasmas?**
   A) Presence of a cell wall
   B) High affinity for columnar epithelium

C) Ability to alter membrane proteins
D) Resistance to acidic environment

7. **Which pathogen causes genital tuberculosis?**
   A) *Mycobacterium tuberculosis*
   B) *Neisseria gonorrhoeae*
   C) *Trichomonas vaginalis*
   D) *Chlamydia trachomatis*

8. **Which complication is characteristic of gonorrhea?**
   A) Perforation of the fallopian tube
   B) Pelvioperitonitis
   C) Ovarian necrosis
   D) Endometrial polyps

9. **Which medication is most commonly used to treat trichomoniasis?**
   A) Metronidazole
   B) Azithromycin
   C) Ofloxacin
   D) Ceftriaxone

II. Open-Ended Questions (Extended Response Tasks)

1. Describe the main clinical manifestations and diagnostic methods of urogenital chlamydia.
2. What treatment stages are included in managing genital tuberculosis?
3. Explain the pathogenesis and clinical features of genital herpes.
4. What complications can arise from chronic gonorrhea, and how can they be prevented?
5. Describe trichomoniasis: its symptoms, diagnostic methods, and treatment principles.

III. Case-Based Clinical Scenarios

Case №1

A 28-year-old woman consulted a gynecologist complaining of burning and discomfort during urination, itching in the external genital area, and profuse frothy yellowish discharge with an unpleasant odor. The symptoms began about 5 days

ago. Medical history: regular sexual activity without barrier contraception. On examination: vaginal mucosa shows hyperemia and edema, with petechial hemorrhages (“strawberry cervix”).

1. What is the most likely diagnosis?
2. What additional tests are necessary to confirm the diagnosis?
3. What treatment should be prescribed?

Case №2

A 40-year-old woman was admitted with complaints of chronic lower abdominal pain, irregular and heavy menstruation, and general health deterioration. Upon questioning, the patient reported a previous diagnosis of pulmonary tuberculosis. She has been unsuccessfully trying to conceive for the past 2 months. On gynecological examination: adnexa are enlarged and tender on palpation. Ultrasound revealed thickened fallopian tubes and small cystic formations. Mantoux test is positive.

1. What is the most likely diagnosis?
2. What additional investigations are needed to confirm the diagnosis?
3. What is the treatment plan?

All supplementary self-assessment materials are available in the Telegram channel:

https://t.me/+_H6LveAOXTw1ZmYy

Or scan the QR code:

Chapter. №7. Uterine Fibroids.

Definition

Uterine fibroids (also known as **leiomyomas** or **fibromyomas**) are **benign, hormone-dependent tumors** arising from the smooth muscle cells of the myometrium. They present as **nodular formations** composed of interwoven bundles of muscle and connective tissue.
Fibroids are among the most **common tumor-like conditions** in women of reproductive age.

Etiology and Epidemiology

The exact cause of fibroid development remains unclear; however, several contributing factors have been identified:

- **Hormonal imbalance:** excess estrogen and relative progesterone deficiency
- **Genetic predisposition**
- **Chronic inflammatory diseases** of the pelvic organs
- **Uterine trauma:** abortions, curettage procedures
- **Early menarche** and **late menopause**
- **Nulliparity** or absence of breastfeeding
- **Obesity, metabolic syndrome, hypertension**

Fibroids are detected in **20–40% of women over the age of 35**, with incidence increasing during **perimenopause**. However, **30–50% of cases are asymptomatic**.

Pathogenesis

Uterine fibroids are **hormone-dependent tumors**, whose growth is **initiated and sustained by estrogen and progesterone**.
The pathogenesis is based on **mutational changes in one or more smooth muscle cells** of the myometrium, leading to **uncontrolled proliferation**.

Main Pathogenetic Mechanisms:

1. **Hormonal stimulation:**
    - Estrogens stimulate **mitotic activity** of myometrial cells.

- Progesterone enhances **estrogen receptor activity** in the myometrium and **inhibits apoptosis** of tumor cells.
- Fibroid cells show **increased expression of sex steroid receptors**.

2. **Genetic predisposition:**
   - Many patients have **family history** of fibroids.
   - **Somatic mutations** in genes regulating the cell cycle (e.g., *MED12*) are often identified.
3. **Tumor growth:**
   - The tumor develops as one or more **nodules** that **increase in size over time**.
   - Nodule formation is accompanied by **enhanced vascularization**, and may show **areas of degeneration, necrosis, or hyalinization**.
4. **Role of associated factors:**
   - Chronic inflammation, **metabolic disorders**, obesity, and **hypertension** contribute to **hormonal dysregulation** and **enhanced tumor growth**.

Clinical Presentation

The severity of symptoms depends on the **size**, **location**, **number of fibroid nodules**, and the presence of **complications**.

1. Menstrual Disorders:

- **Menorrhagia** (heavy menstrual bleeding) — the most common symptom, especially with **submucosal** and **intramural** fibroids that deform the uterine cavity
- **Metrorrhagia** — intermenstrual bleeding
- These types of bleeding may lead to **iron-deficiency anemia**, accompanied by typical symptoms such as fatigue, dizziness, and tachycardia

2. Pain:

- **Dull, aching pain** in the lower abdomen and lower back — often due to **uterine enlargement**

- **Cramping pain** — associated with **submucosal fibroids**, especially during **partial necrosis** or "expulsion" of a submucosal nodule through the cervical canal
- **Acute pain** — may indicate **torsion of a pedunculated subserosal fibroid** or **fibroid necrosis**

3. Symptoms of Compression of Adjacent Organs:

- **Dysuria, frequent urination, urinary hesitancy** — due to **compression of the bladder**
- **Constipation, pressure sensation in the rectum** — in case of **posterior fibroid location**
- **Abdominal heaviness or enlargement** — with large fibroids

4. Reproductive Dysfunction:

- **Infertility** — fibroids may interfere with implantation, block ovum transport, or cause **chronic endometrial inflammation**
- **Spontaneous miscarriages, preterm labor** — especially when the uterine cavity is distorted
- **Failed IVF attempts** — fibroids may impair the effectiveness of assisted reproductive technologies

5. General Symptoms:

- **Chronic anemia** — resulting from prolonged or heavy bleeding
- **Fatigue, reduced work capacity**
- **Psychological and emotional distress** — due to chronic pain and bleeding

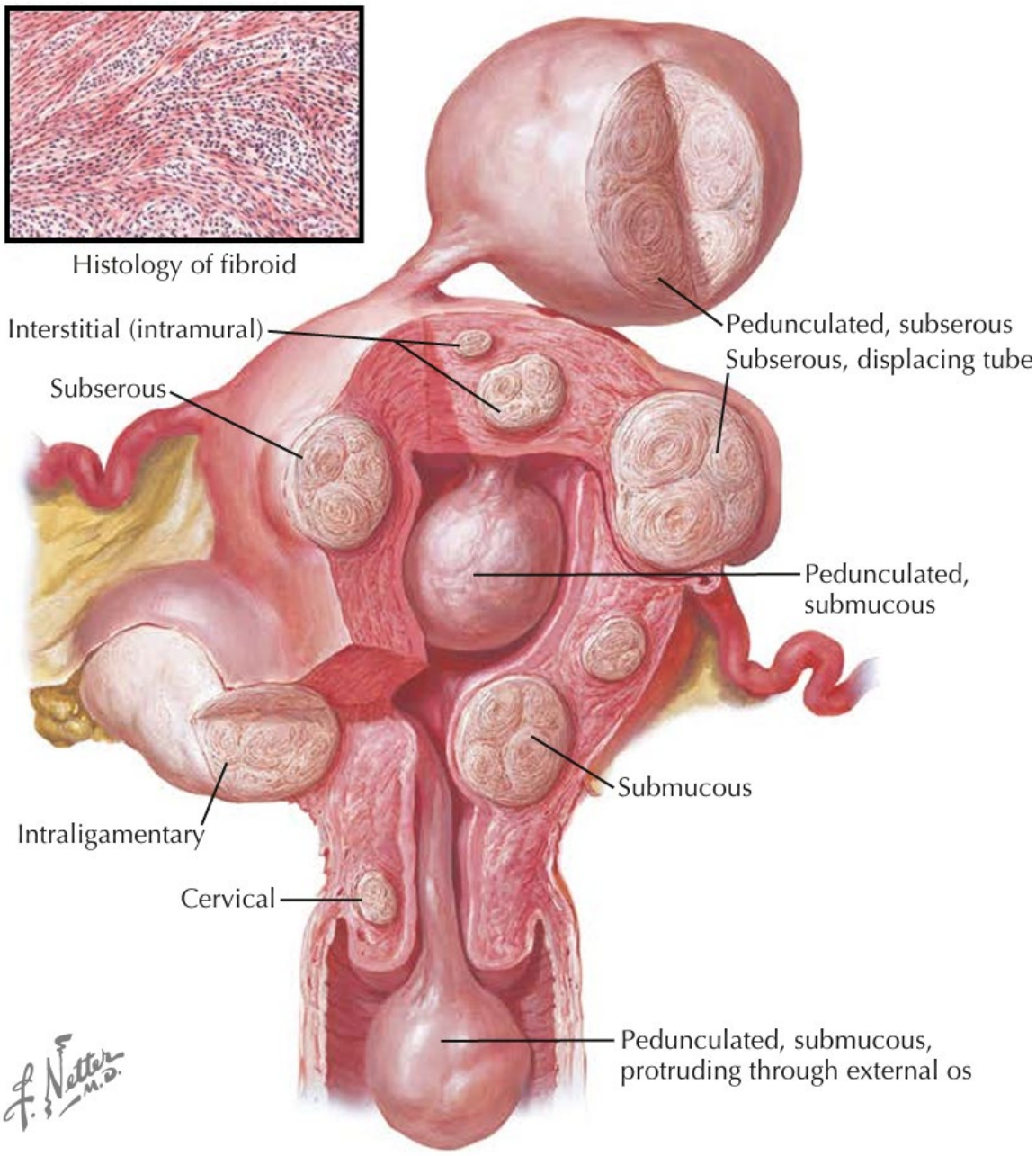

Figure 7.1. Locations of Uterine Leiomyomas

Diagnosis

- **Gynecological examination** — uterine enlargement, detection of dense areas
- **Pelvic ultrasound (transabdominal and transvaginal)** — primary diagnostic method to assess the **size, location, and number of fibroid nodules**
- **Hysteroscopy** — useful for evaluating **submucosal fibroids**

- **Hysterosalpingography (HSG)** — performed in cases of **infertility**
- **MRI and CT** — to clarify **structure** and **vascularization** of the fibroids
- **Endometrial biopsy** — indicated in **atypical bleeding**
- **Hemoglobin and ferritin levels** — to evaluate for **anemia**
- **Differential diagnosis** — rule out **uterine sarcoma, adenomyosis, and ovarian cysts**

Complications

- Chronic anemia
- Fibroid necrosis (especially with torsion of a pedunculated fibroid)
- Torsion of subserosal fibroid
- Compression-related dysfunction of adjacent organs (urinary retention, constipation)
- Reproductive dysfunction (infertility, miscarriage)
- Malignant transformation (very rare — <1%)
- Rapid fibroid growth may **mimic malignancy**

Treatment

The treatment strategy depends on **patient age**, **symptoms**, **fibroid size and location**, and whether the patient **wishes to preserve fertility**.

Conservative treatment:

- **Hormonal therapy:**
  - Combined oral contraceptives (for small fibroids)
  - Progestins (e.g., dienogest, norethisterone)
  - GnRH agonists — temporarily shrink fibroids (not for >6 months)
  - GnRH antagonists, selective progesterone receptor modulators (e.g., **ulipristal acetate**)
- **NSAIDs**, **iron supplements** — for pain and anemia
- Diet, **weight management**, **physiotherapy**

Surgical treatment:

- **Myomectomy** — removal of fibroids with uterine preservation (for women wishing to retain fertility)
- **Hysterectomy** — complete uterine removal (in cases of multiple or large fibroids, severe symptoms, or absence of reproductive plans)
- **Hysteroscopic resection** — for submucosal fibroids
- **Uterine artery embolization (UAE)** — a **minimally invasive** procedure causing fibroid infarction and shrinkage

Prevention

- Regular gynecological exams and **ultrasound screening**
- Rational **contraceptive use** (to avoid abortions and curettage)
- Correction of **hormonal imbalances**
- Treatment of **pelvic inflammatory diseases**
- **Weight control**, physical activity, and **stress reduction**

7.1. Endometriosis

Definition

Endometriosis is a **chronic, hormone-dependent, inflammatory-proliferative disease** characterized by the presence of **endometrial-like tissue** (both morphologically and functionally) **outside the uterine cavity**. These ectopic lesions undergo **cyclical changes** similar to those of the normal endometrium, including **menstrual-like bleeding**, which results in chronic inflammation, adhesion formation, and fibrosis.

Etiology and Epidemiology

The **etiology of endometriosis** remains not fully understood. Several theories have been proposed:

- **Implantation theory** (retrograde menstruation through the fallopian tubes into the peritoneal cavity)
- **Metaplastic theory** (transformation of peritoneal epithelium into endometrial tissue)

- **Hematogenous and lymphatic spread**
- **Genetic predisposition**

Endometriosis affects approximately **10–15% of women of reproductive age**, especially those who are **nulliparous** and have **infertility issues**. It is most commonly diagnosed in women aged **25–40 years**.

Pathogenesis

Endometriosis is a **heterogeneous disease** based on the **migration, implantation, proliferation**, and **inflammatory response** of endometrial-like tissue outside the uterine cavity.

Cyclical Activity of Ectopic Endometrial Lesions:

Like normal endometrial tissue, ectopic endometrial foci undergo cyclic phases:

- **Proliferation**
- **Secretion**
- **Decidualization**
- Followed by **menstrual-like bleeding**

However, since **there is no outlet for the blood**, it leads to:

- **Peritoneal irritation**
- **Hematoma formation and inflammation**
- **Chronic pelvic pain**
- **Ovarian "chocolate cysts" (endometriomas)**
- **Progressive infertility**

Key Mechanisms in the Pathogenesis of Endometriosis:

1. Retrograde Menstruation (Sampson's Implantation Theory)

The most widely accepted theory. Menstrual blood containing viable endometrial cells flows backward through the fallopian tubes into the peritoneal cavity, where cells implant onto peritoneal surfaces, ovaries, and pelvic structures. However, since **retrograde menstruation occurs in most women**, but

endometriosis develops only in some, additional roles are attributed to **immune dysfunction** and **genetic factors**.

2. Metaplastic Theory (Meyer's Theory)

This theory suggests that **visceral and parietal peritoneal cells** can **transform into endometrial-like tissue** under the influence of **hormonal and inflammatory stimuli**.
It explains **rare cases in premenarchal girls** and **extragenital endometriosis** (e.g., lungs, scars, brain).

3. Hematogenous and Lymphatic Spread (Halban's Theory)

Endometrial cells can enter the **bloodstream or lymphatic system** and be transported to distant sites, accounting for endometriosis in the **lungs, conjunctiva, CNS, and surgical scars**.

4. Immune System Dysfunction

Women with endometriosis show:

- Reduced **natural killer (NK) cell** activity
- Impaired **phagocytosis** and **antigen presentation**
- Local **immune inflammation** with elevated levels of **cytokines** (IL-1, IL-6, TNF-α), **prostaglandins**, and **matrix metalloproteinases (MMPs)**
- Failure to eliminate retrograde endometrial cells, allowing their **implantation and survival**

5. Hormonal Dependence

- Ectopic endometrial foci express **estrogen and progesterone receptors**, but with an **abnormal ratio**: **increased estrogen sensitivity** and **reduced response to progesterone** (*"progesterone resistance"*)
- Local **estrogen synthesis** is activated via **aromatase**, stimulating proliferation and inflammation
- **COX-2 overexpression** and increased **prostaglandin production** contribute to **pain** and **hypervascularization**

6. Invasion and Angiogenesis

- Endometrial cells produce **MMPs**, which degrade the extracellular matrix, allowing **tissue invasion**
- **Angiogenesis** is stimulated to support the growth of ectopic lesions
- **Inflammation** promotes **fibrosis**, **adhesions**, **cyst formation**, and disrupts **pelvic anatomy and organ function**

Classification by Localization

1. Genital Endometriosis

This is the most common form, in which endometriotic lesions are located within the reproductive organs.

A. Internal Genital Endometriosis — Adenomyosis

- Involves **infiltration of the myometrium** (muscular layer of the uterus) by endometrial-like tissue (heterotopias)
- The ectopic tissue undergoes **cyclical proliferation and bleeding**, leading to **chronic inflammation**, **fibrosis**, and **uterine hypertrophy**

Clinical features:

- Painful menstruation (**dysmenorrhea**)
- **Heavy menstrual bleeding** (menorrhagia)
- Enlarged uterus
- **Dyspareunia** (pain during intercourse)

Forms:

- Diffuse
- Nodular
- Focal

B. External Genital Endometriosis

Lesions are located outside the uterus but within the pelvic cavity:

- **Ovarian endometriosis:**
    - Formation of endometriotic (“chocolate”) cysts

- Disrupts ovulation, causes **adhesions** and **infertility**
- Characterized by **cyclical enlargement** of the cyst and pelvic pain

- **Tubal endometriosis:**
  - Affects the **mucosa or serosa** of the fallopian tubes
  - Often associated with **infertility** due to adhesions and **tubal obstruction**
- **Pelvic peritoneal endometriosis:**
  - Lesions on the **pelvic peritoneum**, **Douglas pouch**, **sigmoid colon**
  - Manifests as **chronic pelvic pain**, **dyspareunia**, **pain during defecation**, and **dysmenorrhea**
- **Vaginal and vulvar endometriosis:**
  - **Rare form**
  - Presents as **bluish, painful nodules** in the vaginal vestibule or posterior commissure, with **bloody discharge** during menstruation
- **Endometriosis of the uterosacral and broad ligaments:**
  - Commonly associated with **deep dyspareunia** and **menstrual pain radiating to the rectum or lower back**

2. Extragenital Endometriosis

Lesions are located **outside the reproductive system** but remain **hormonally active** and **function cyclically**.

- **Intestinal endometriosis:**
  - Involvement of the **rectum**, **sigmoid**, or **cecum**
  - Symptoms: **painful defecation**, **constipation**, **rectal bleeding during menstruation**
- **Bladder and urethral endometriosis:**
  - Symptoms: **dysuria**, **painful urination**, **hematuria during menses**
  - Often associated with **retrograde menstruation** and **pelvic endometriosis**

- **Umbilical and post-surgical scar endometriosis:**
  - Lesions develop in **surgical scars** (most often after cesarean section)
  - Present as **nodules with cyclical pain** and **bloody discharge**
- **Pulmonary and pleural endometriosis:**
  - Rare; usually occurs in women with **coexisting pelvic endometriosis**
  - Symptoms: **hemoptysis**, **chest pain**, **pneumothorax**, occurring **synchronously with menstruation**
- **Cerebral and ocular endometriosis:**
  - **Extremely rare (case reports only)**
  - Symptoms depend on lesion location and may include **cyclical neurologic or visual disturbances**

Clinical Presentation

Symptoms vary depending on the **location** and **extent** of the disease:

1. Pain Syndrome:

- **Cyclical lower abdominal pain**
- **Dysmenorrhea** — painful menstruation that tends to **worsen over time**
- **Dyspareunia** — pain during sexual intercourse
- **Pain during defecation or urination** — when endometriotic lesions affect the **bowel** or **urinary tract**

2. Menstrual Irregularities:

- **Hypermenorrhea** (heavy menstrual bleeding)
- **Metrorrhagia** (intermenstrual bleeding)

3. Infertility:

- **Pelvic adhesions**
- **Ovulatory dysfunction**
- **Impaired implantation**

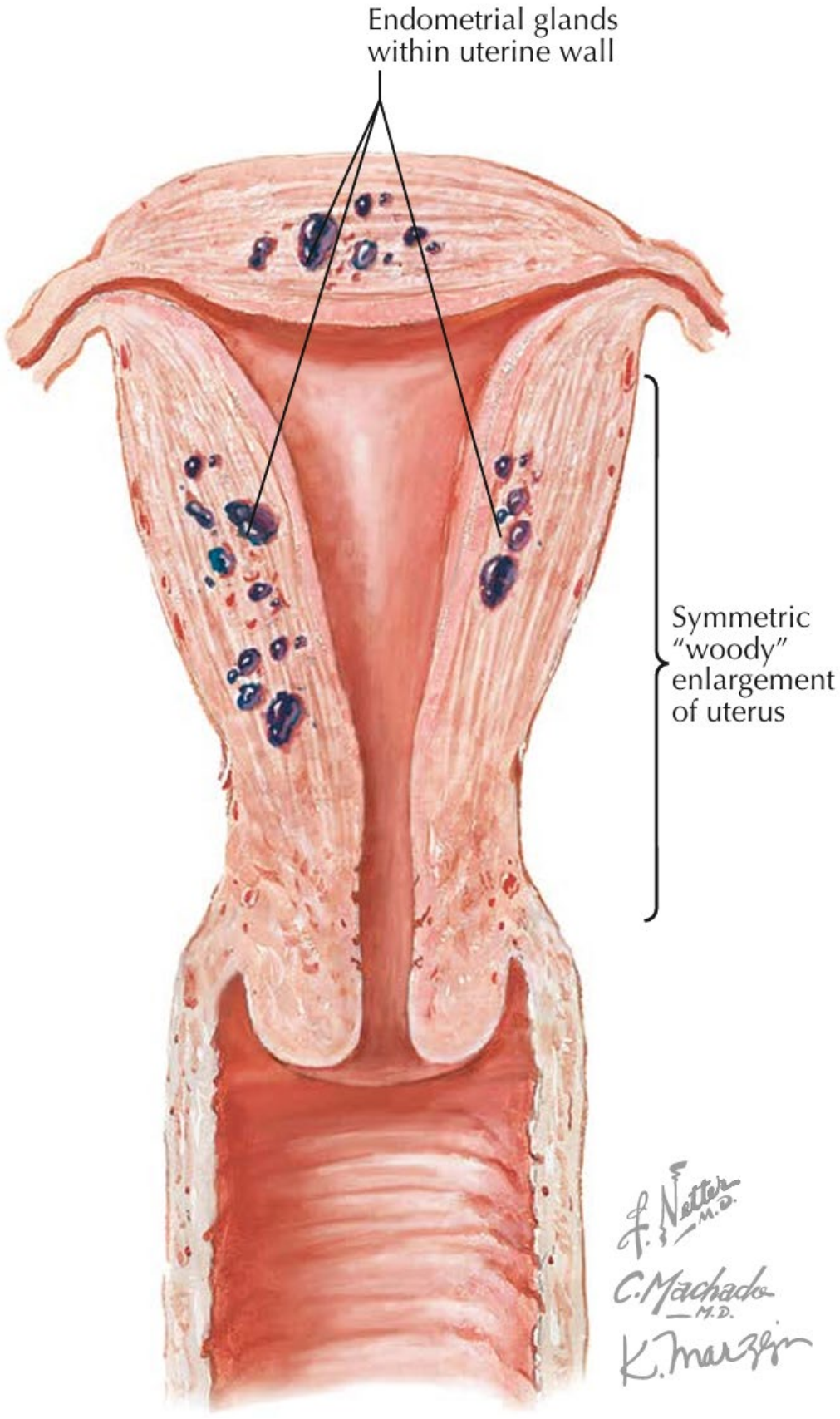

Figure 7.2. Uterus with Adenomyosis

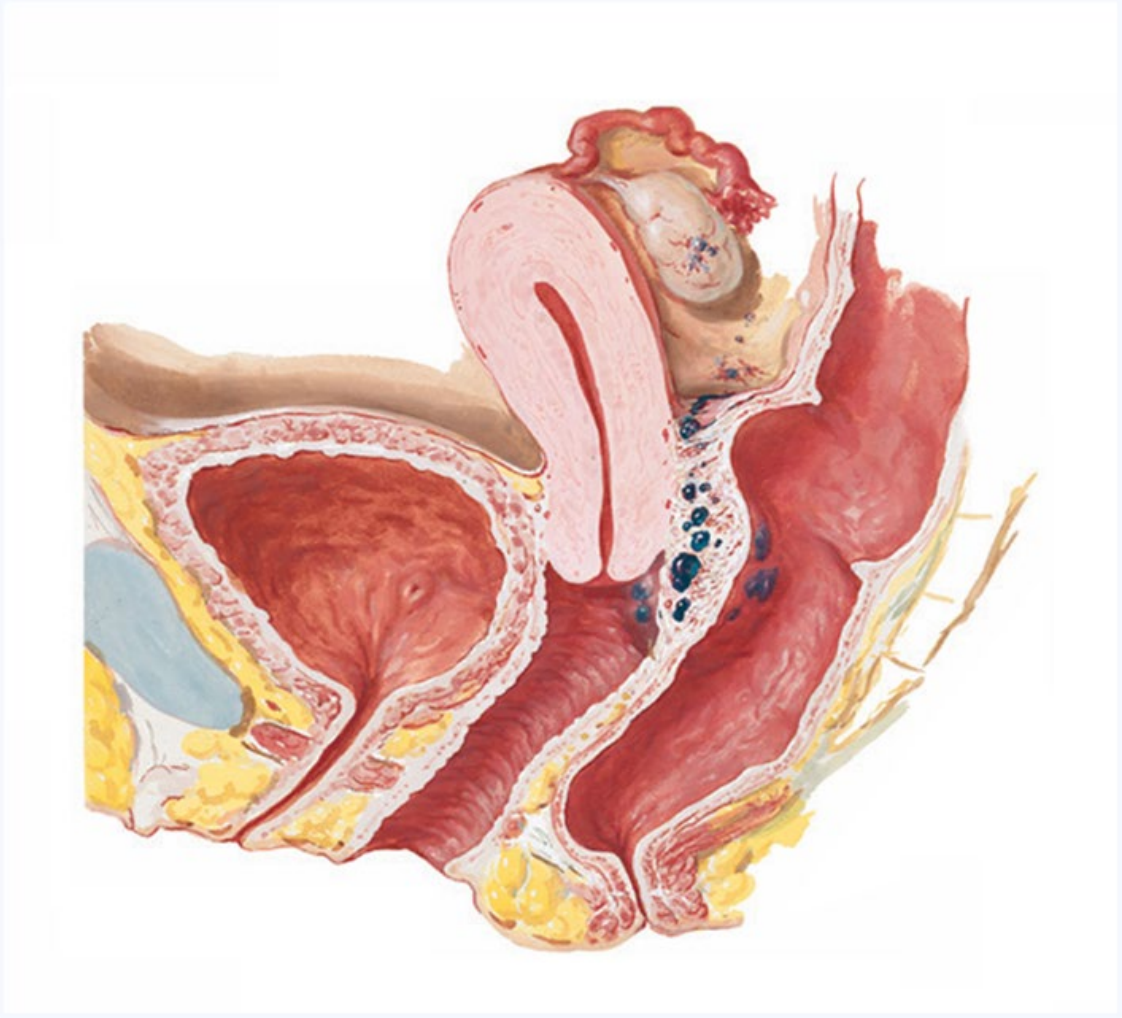

Рисунок 7.3. Эндометриоз ректовагинальной перегородки и заднего форникса

4. Symptoms of Extragenital Endometriosis:

- **Intestinal involvement**:
  - Constipation
  - Pain during defecation
  - **Rectal bleeding** during menstruation
- **Pulmonary involvement**:
  - **Hemoptysis** (coughing up blood) that coincides with the **menstrual cycle**

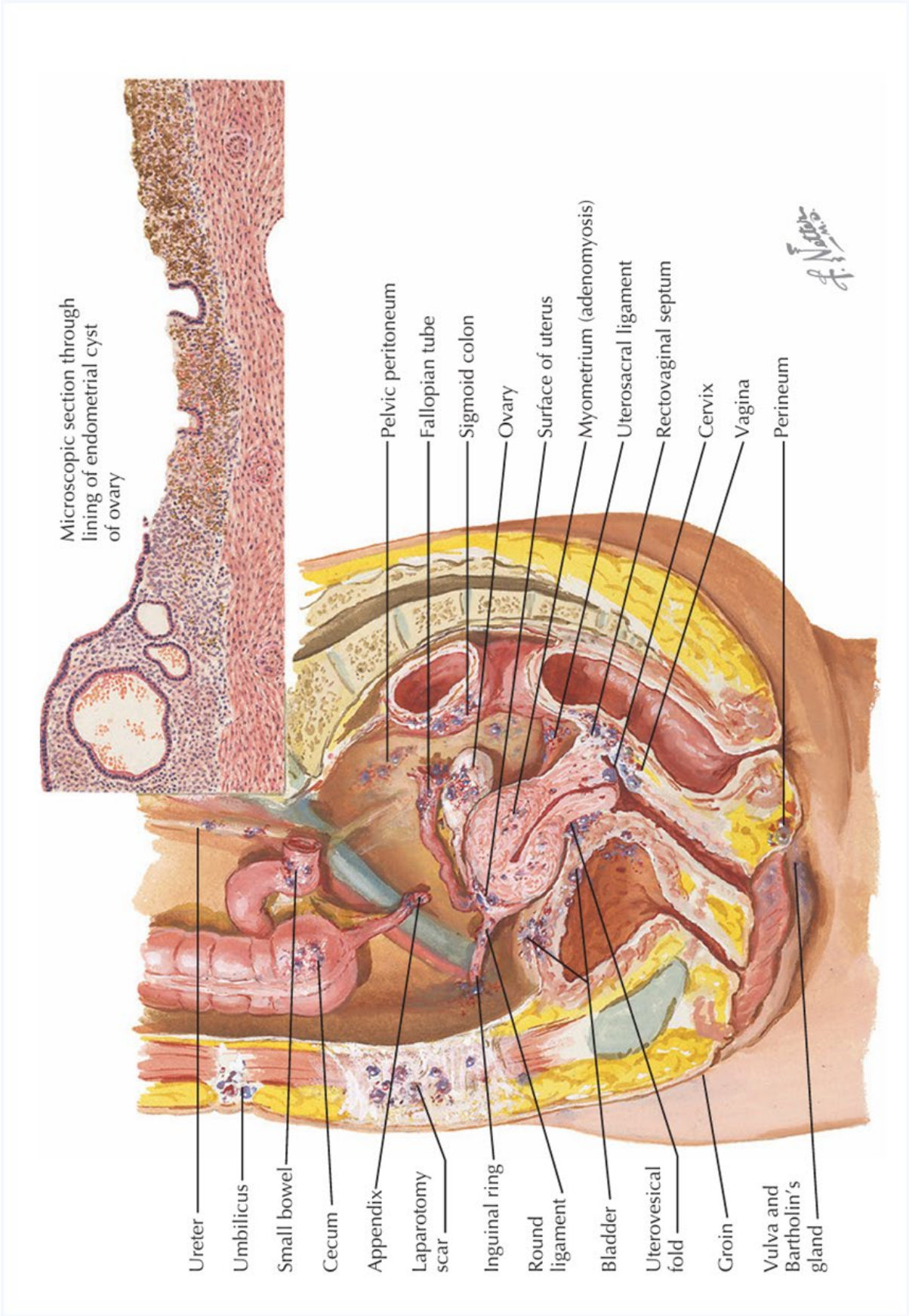

Figure 7.4. External Appearance and Possible Sites of Endometriosis Spread

Diagnosis

- **Gynecological examination** — enlarged uterus, tenderness in the adnexal area, limited uterine mobility
- **Pelvic ultrasound** — especially informative in **ovarian endometriosis**
- **MRI or CT** — used for detecting **extragenital endometriotic foci**
- **Diagnostic laparoscopy** — the **"gold standard"**, allows direct **visualization of lesions** and **biopsy for histology**
- **Tumor marker CA-125** — may be elevated in endometriosis, though **non-specific**

Complications

- **Chronic pelvic pain**
- **Infertility**
- **Pelvic adhesions**
- **Endometriotic cyst formation** (most commonly ovarian)
- **Internal bleeding**
- Rarely — **malignant transformation** of endometriotic lesions

Treatment

Treatment choice depends on **patient's age**, **symptoms**, **lesion location and severity**, and **reproductive plans**

Conservative (Medical) Treatment:

- **Hormonal therapy:**
  - **Progestins** (dienogest, norethisterone)
  - **Combined oral contraceptives (COCs)**
  - **GnRH agonists** (used for up to 6 months)
  - **GnRH antagonists**
  - **Levonorgestrel-releasing intrauterine device** (LNG-IUD, e.g., **Mirena**)

- **NSAIDs** — for pain relief
- **Enzyme therapy**, **immunomodulators** — as indicated

Surgical Treatment:

- **Laparoscopic removal** of endometriotic lesions: excision, coagulation, or **laser vaporization**
- In **adenomyosis**:
    - **Myometrial resection** may be performed
    - In severe cases, **hysterectomy** may be indicated (for women without reproductive plans)

Prevention

- **Regular gynecologic check-ups**
- **Timely management** of menstrual disorders
- **Rational hormonal contraception**
- **Avoidance of abortion** and **endometrial trauma**
- **Stress reduction** and **immune support** in chronic illnesses

Questions for the Chapter

I. Multiple-Choice Questions (Single Best Answer)

1. **What are the main symptoms characteristic of submucosal uterine fibroids?**
   A) Infertility, bleeding
   B) Pelvic pain, organ compression
   C) Anemia, cramping pain
2. **What is the "gold standard" for diagnosing endometriosis?**
   A) Pelvic ultrasound
   B) Laparoscopy with histology
   C) Contrast-enhanced MRI
3. **What is the primary mechanism in the development of uterine fibroids?**
   A) Altered estrogen receptor sensitivity

B) Chronic ischemia of the myometrium

C) Activation of inflammatory processes

4. **Which tissues can be affected by endometriosis?**
   A) Only reproductive organs
   B) Any body tissues
   C) Epithelium and connective tissue

5. **What are the most likely complications of uterine fibroids?**
   A) Nodule necrosis, infertility
   B) Malignant transformation
   C) Spontaneous uterine rupture

6. **What is the preferred treatment for ovarian endometriosis?**
   A) Conservative therapy
   B) Surgical excision of lesions
   C) Combination of surgery and hormonal therapy

7. **What is typical of pain associated with endometriosis?**
   A) Pain intensifies during the perimenstrual period
   B) Constant severe pain
   C) Periodic dull pain not related to the cycle

8. **Which hormone primarily stimulates the growth of uterine fibroids?**
   A) Androgens
   B) Progesterone
   C) Estrogens

9. **What treatment methods are used for uterine fibroids?**
   A) Hormonal therapy, uterine artery embolization
   B) Radiation therapy
   C) Exclusively surgical removal

II. Open-Ended Questions (Extended Response Tasks)

1. Describe the pathogenesis and main clinical manifestations of uterine fibroids.

2. What are the main approaches to the diagnosis and treatment of endometriosis?

3. What complications can arise from uterine fibroids, and how can they be prevented?
4. Explain the relationship between endometriosis and infertility. What treatment options are available to restore fertility?
5. What are the indications for surgical treatment of uterine fibroids?

III. Case-Based Clinical Scenarios

Case №1

A 35-year-old woman presented with complaints of heavy and prolonged menstruation (up to 10 days), accompanied by cramping lower abdominal pain. Over the past 6 months, the menstruation has become more painful and abundant. The patient also notes general weakness, fatigue, and pale skin.
History: 2 pregnancies, 1 induced abortion.
Gynecological exam: uterine enlargement to the size of a 9-week pregnancy.
Ultrasound: submucosal fibroids up to 4 cm, one deforming the uterine cavity.

1. What is the most likely diagnosis?
2. What diagnostic methods will confirm the diagnosis?
3. What is the optimal treatment in this case?

Case №2

A 30-year-old woman complains of chronic pelvic pain that worsens 1–2 days before menstruation and irregular menstrual cycles. The patient also reports difficulties during sexual intercourse (dyspareunia).
History: 2 years of unsuccessful attempts to conceive.
Ultrasound: endometriotic ovarian cysts up to 3 cm and small endometriosis foci in the pelvic peritoneum.

1. What is the most likely diagnosis?
2. What additional tests can confirm the diagnosis?
3. What is the most effective treatment?

Case №3

A 40-year-old woman presents with complaints of heaviness and pressure in the lower abdomen, irregular periods with heavy blood loss, and chronic fatigue.

Exam: uterine enlargement to the size of a 12-week pregnancy, tenderness on palpation.
Ultrasound: intramural fibroids up to 5 cm deforming the uterine contour.
Blood test: moderate anemia (hemoglobin 90 g/L).

1. What is the most likely diagnosis?
2. What are the most informative diagnostic methods?
3. What treatment would you recommend in this case?

All supplementary self-assessment materials are available in the Telegram channel:

https://t.me/+_H6LveAOXTw1ZmYy

Or scan the QR code:

Chapter №8. Benign and Malignant Ovarian Tumors

Ovarian tumors represent one of the most **complex and clinically significant categories** of neoplasms in gynecology. They are characterized by a wide range of **morphological types**, **clinical presentations**, and **prognoses**.

A distinct feature of ovarian tumors is that they often develop **asymptomatically or with minimal symptoms** in the early stages, which frequently leads to **delayed diagnosis**, especially in malignant cases.

Originating from various tissues (epithelium, stroma, germ cells), ovarian tumors can be **benign**, **malignant**, or **borderline**. Importantly, these tumors **occur across all age groups**, from childhood to postmenopause.

Clinically, ovarian tumors may manifest with **pelvic pain**, **menstrual irregularities**, **infertility**, signs of **hormonal activity**, or may be **incidentally detected** during routine examinations or ultrasound.

Classification of Ovarian Tumors and Tumor-like Formations

I. Epithelial Tumors

Derived from the **surface epithelium of the ovary**, and include the following types:

1. **Serous Tumors**
    - **Benign**: serous cystadenoma, papillary cystadenoma, adenofibroma
    - **Borderline**: papillary cystadenoma, borderline adenofibroma
    - **Malignant**: serous adenocarcinoma, papillary carcinoma
2. **Mucinous Tumors**
    - **Benign**: mucinous cystadenoma, mucinous adenofibroma
    - **Borderline**: mucinous borderline tumor
    - **Malignant**: mucinous adenocarcinoma
3. **Endometrioid Tumors**
    - May be **benign or malignant**
    - May transform into **endometrioid carcinoma** or **sarcoma**

4. **Clear Cell Tumors**
    - Rarely benign
    - Most commonly: **clear cell adenocarcinoma**
5. **Brenner Tumors**
    - Can be **benign**, **borderline**, or **malignant**
6. **Mixed Epithelial Tumors**
7. **Undifferentiated and Unclassifiable Epithelial Tumors**

II. Sex Cord–Stromal Tumors (Hormone-Producing Tumors)

These tumors may produce **estrogens** or **androgens**.

1. **Granulosa Cell Tumor**
2. **Thecoma–Fibroma Group**
    - **Thecoma**
    - **Fibroma**
    - **Mixed forms**
3. **Androblastomas (Sertoli–Leydig Cell Tumors)**
4. **Gynandroblastoma**
5. **Unclassifiable Stromal Tumors**

III. Germ Cell Tumors

These tumors arise from **primordial germ cells** and are **most common in young women**.

- **Dysgerminoma**
- **Yolk sac tumor** (Endodermal sinus tumor)
- **Choriocarcinoma**
- **Embryonal carcinoma**
- **Teratomas:**
    - **Mature (dermoid)** — solid or cystic

  - **Immature** — malignant potential
  - **Monodermal teratomas** (e.g., struma ovarii, carcinoid)
- **Mixed germ cell tumors**
- **Gonadoblastoma**

IV. Non-Specific Ovarian Tumors

Tumors that are **not specific to the ovary**, including:

- **Leiomyomas**
- **Hemangiomas**
- **Lipomas**

V. Unclassifiable Tumors

Tumors that **do not fit into recognized histological categories**.

VI. Secondary (Metastatic) Tumors

- **Metastases from other organs**, most commonly the **gastrointestinal tract** and **breast**
- A classic example is **Krukenberg tumor** — a metastatic mucinous adenocarcinoma, usually from the **stomach**

VII. Tumor-like Conditions

These are **non-neoplastic**, often **functional** in nature, and **not true tumors**.

- **Luteoma of pregnancy**
- **Ovarian stromal hyperplasia**
- **Follicular cysts**, **corpus luteum cysts**
- **Multiple follicular formations**
- **Paraovarian cysts**
- **Endometriotic cysts**
- **Simple cysts**, **inclusion cysts**
- **Inflammatory infiltrates**

8.1. Epithelial Tumors

Epithelial tumors constitute a **significant proportion of ovarian neoplasms** and develop from the **surface (mesothelial) epithelium** covering the ovary.

These tumors are classified based on **histological architecture** and **malignancy potential** into:

- **Benign**
- **Borderline**
- **Malignant**

1. Serous Tumors

Definition and Morphology:

Serous tumors are the **most common** type of epithelial ovarian neoplasms. They resemble the **epithelium of the fallopian tubes** and typically appear as **multiloculated cysts** filled with **clear serous fluid**.

The tumor surface may be:

- **Smooth**, or
- **Covered with papillary projections**

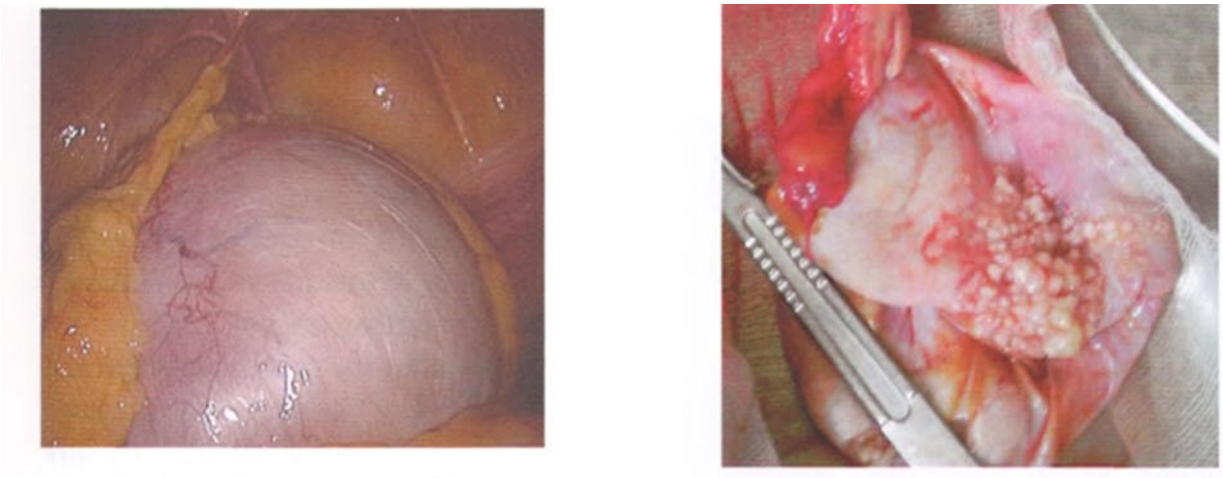

Figure 8.1.:A – Simple serous cystadenoma (laparoscopic view), B – Papillary serous cystadenoma (view after capsule incision)

Classification of Serous Tumors:

- **Benign**:
    - **Serous cystadenoma**

- **Papillary cystadenoma**
- **Adenofibroma**
  These tumors have **smooth walls**, **slow growth**, and **rarely recur**.

- **Borderline**:
  - **Papillary serous tumor of low malignant potential**
  - These exhibit **proliferative activity** but **lack stromal invasion**.

- **Malignant**:
  - **Serous adenocarcinoma**
  - Characterized by **infiltrative growth**, **capsular invasion**, and **peritoneal metastasis**.

Clinical Presentation:

In early stages, **serous tumors are often asymptomatic**. As the tumor grows, patients may experience:

- **Lower abdominal pain**
- **Abdominal distension**
- **Compression symptoms** on adjacent organs
- In advanced cases — **ascites**

2. Mucinous Tumors

Definition and Morphology:

Mucinous tumors are characterized by **multiloculated cystic spaces** filled with **thick, mucus-like fluid (mucin)**. The tumor epithelium resembles that of the **intestinal** or **endocervical** type.

Classification of Mucinous Tumors:

- **Benign**:
  - **Mucinous cystadenoma**
  - **Adenofibroma**
    These tumors may reach **very large sizes**, occupying a **significant portion of the abdominal cavity**.

- **Borderline**:
    - **Mucinous tumor with epithelial proliferation** but **without stromal invasion**
- **Malignant**:
    - **Mucinous adenocarcinoma**, known for its **invasive behavior** and **metastatic potential**

Clinical Presentation:

- Often **asymptomatic in early stages**
- As the tumor enlarges:
    - **Abdominal distension**
    - **Heaviness or pressure in the abdomen**
    - **Dyspeptic symptoms** (e.g., bloating, nausea)
- In rare cases, **tumor rupture** may occur, leading to **pseudomyxoma peritonei**, a serious complication involving **mucin accumulation** in the peritoneal cavity

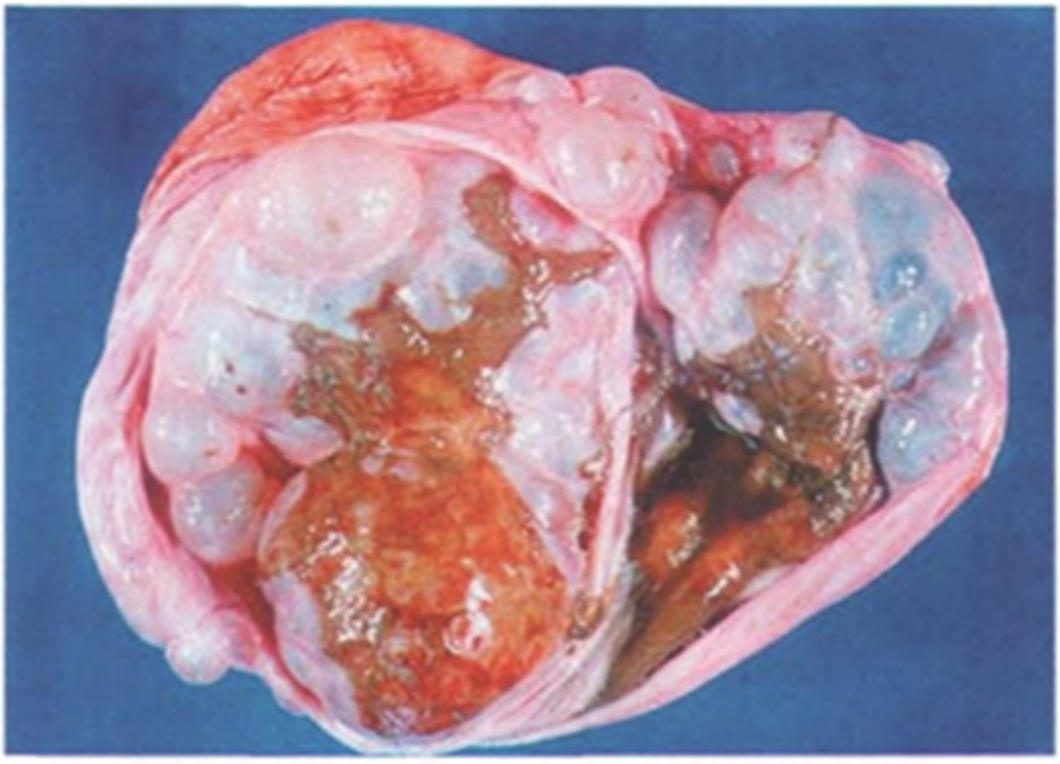

Figure 8.2. Mucinous cystadenoma (Gross specimen)

3. Endometrioid Tumors

Definition and Morphology:

Endometrioid tumors resemble the **glandular tissue of the endometrium** and are frequently associated with **endometriosis**.
They may present as **cystic or solid** masses.

Classification:

- **Benign**: Endometrioid cystadenoma, adenofibroma
- **Borderline**: Endometrioid tumor with epithelial proliferation **without stromal invasion**
- **Malignant**: Endometrioid adenocarcinoma, prone to **invasion** and **metastasis**

Clinical Presentation:

- **Menstrual irregularities**
- **Lower abdominal pain**
- **Infertility**
- In advanced cases — **symptoms of metastases**

4. Clear Cell Tumors

Definition and Morphology:

A **rare subtype** of epithelial ovarian tumors composed of cells with **clear or pale cytoplasm**.
Often associated with **endometriosis**.

Classification:

- **Benign**: Clear cell adenofibroma
- **Borderline**: Clear cell tumor with proliferation but **no invasion**
- **Malignant**: Clear cell adenocarcinoma — known for **aggressive behavior** and **chemoresistance**

Clinical Presentation:

- **Pelvic pain**

- **Ascites**
- **Compression symptoms** involving pelvic organs
- Frequently diagnosed at **advanced stages**

5. Brenner Tumors

Definition and Morphology:

Rare tumors derived from **transitional epithelium**, resembling **urothelium**. Usually small, firm, and well circumscribed.

Classification:

- **Benign**: Brenner tumor
- **Borderline**: Proliferating Brenner tumor
- **Malignant**: Malignant Brenner tumor (transitional cell carcinoma)

Clinical Presentation:

- Often **asymptomatic**, discovered **incidentally**
- Larger tumors may cause **lower abdominal pain** and **urinary symptoms**

6. Mixed Epithelial Tumors

Definition and Morphology:

Tumors composed of **more than one epithelial type**, such as **serous and mucinous** elements.

Classification:

- **Benign**: Mixed epithelial tumor **without proliferative features**
- **Borderline**: With **epithelial proliferation but no stromal invasion**
- **Malignant**: Mixed **adenocarcinoma** with **invasive growth**

Clinical Presentation:

- Depends on the **dominant histological component** and tumor size
- May include:
    - **Abdominal pain**

- **Abdominal distension**
- **Compression symptoms** involving adjacent organs

8.2. Sex Cord–Stromal Tumors (Hormone-Active Tumors)

These tumors arise from **stromal and sex cord cells** of the ovary — components responsible for **follicle formation** and **hormonal regulation**. They frequently produce **sex hormones** (estrogens or androgens), resulting in **pronounced clinical manifestations**.

Most commonly found in **reproductive-age** and **perimenopausal/postmenopausal women**, but may also occur in **children and adolescents**.

1. Granulosa Cell Tumor

Definition and Morphology:

Arises from cells similar to **granulosa cells** of the ovarian follicle. Occurs most frequently in **perimenopausal and postmenopausal women**, but can also be seen in **younger patients** (juvenile form). These tumors often produce **high levels of estrogen**.

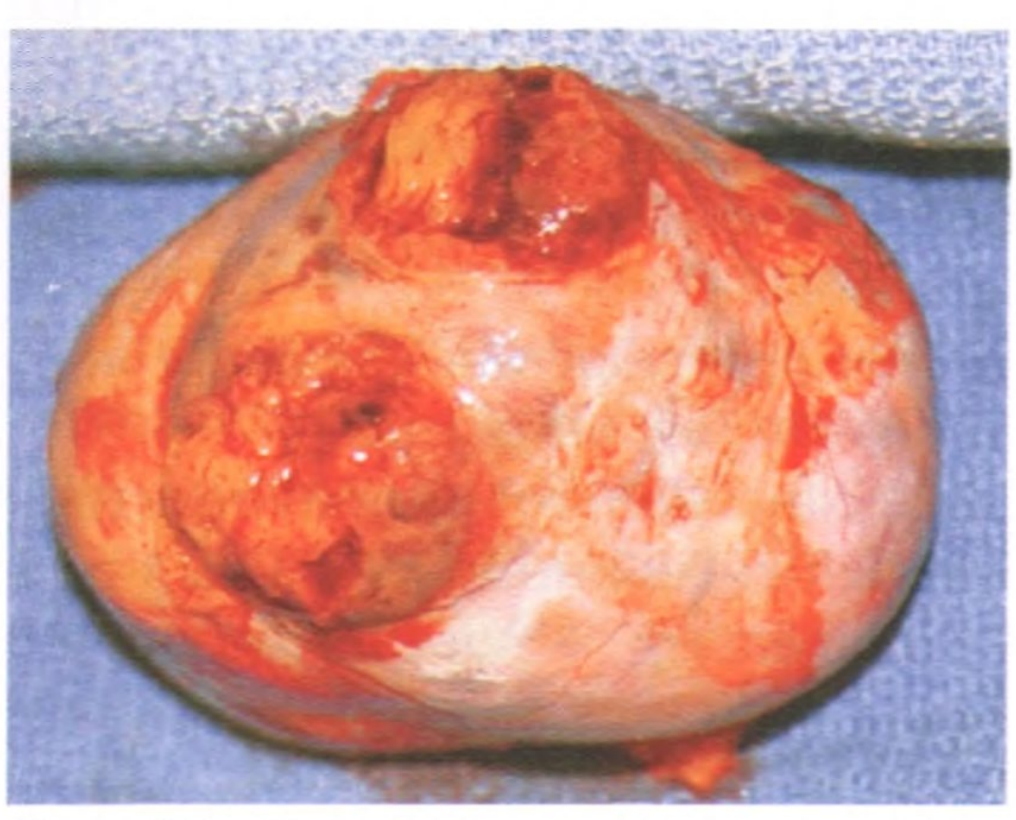

Figure 8.3. Granulosa cell tumor of the ovary

Forms:

- **Adult type** (≈95% of cases)
- **Juvenile type** (more common in **girls and adolescents**)

Clinical Presentation:

- **Menstrual irregularities**
- **Metrorrhagia**, **endometrial hyperplasia**
- In young girls — **precocious puberty**
- In postmenopausal women — **recurrent uterine bleeding**

Oncologic Potential:

Typically behaves as a **benign tumor**, but **late recurrences and metastases** are possible, even **years after surgical removal**.

2. Thecoma–Fibroma Group

This group combines two **histologically distinct tumors** derived from **connective tissue and theca cells**.

Thecoma

Definition:

A **benign hormone-producing tumor** originating from **theca cells** of the ovary. Primarily synthesizes **estrogens**, and more rarely **androgens**, which explains its **clinical manifestations**.

Epidemiology:

Most common in **perimenopausal and postmenopausal** women. Accounts for **2–5% of all ovarian tumors**.

Morphology:

- Typically a **solid**, **firm**, **yellowish-brown**, **unilateral** tumor
- Histology reveals **bundles of theca cells** with abundant cytoplasm, sometimes containing **lipid inclusions**

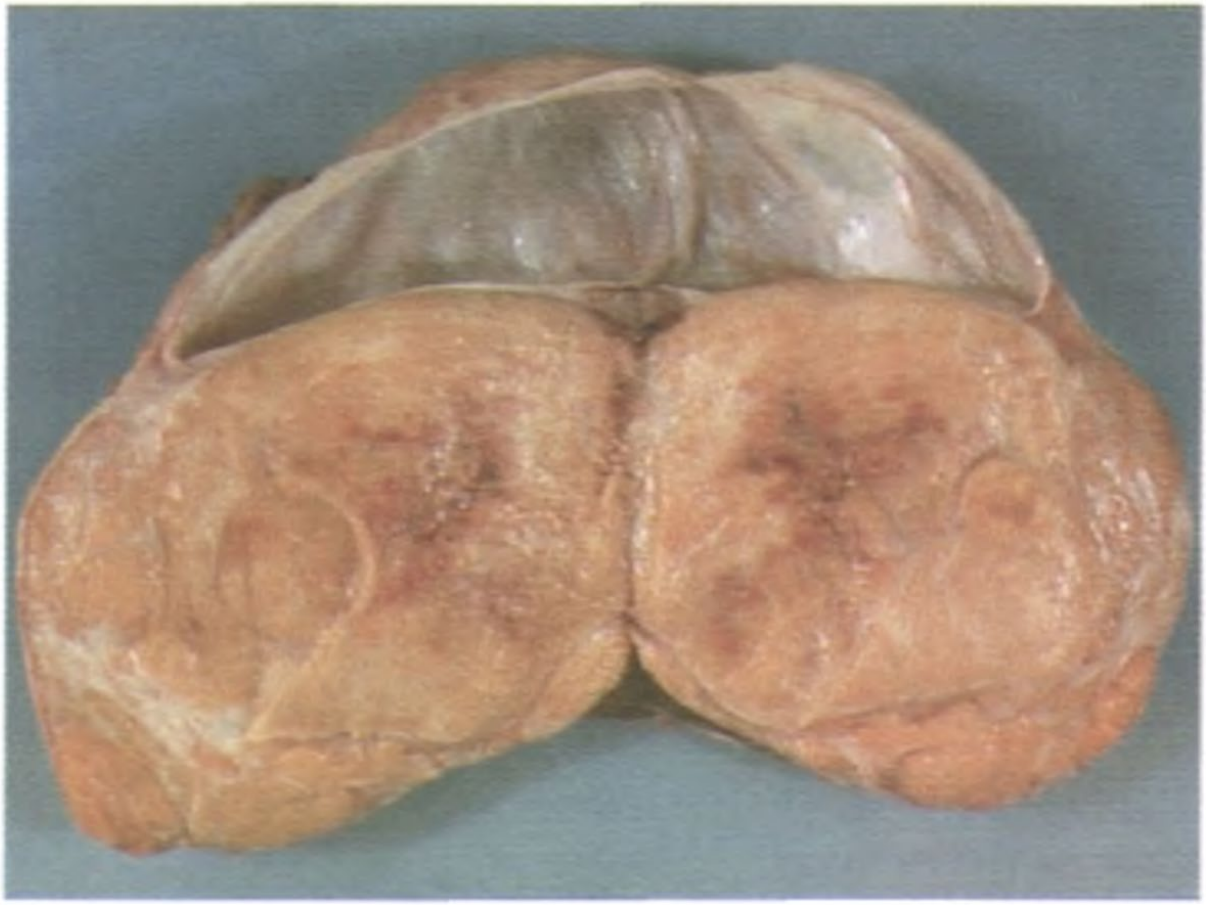

Figure 8.4. Ovarian thecoma (cross-sectional view)

Clinical Presentation of Thecoma:

- In **reproductive-age women**:
  - **Hyperestrogenism**, manifesting as **menstrual irregularities**, **menorrhagia**
- In **postmenopausal women**:
  - **Recurrent uterine bleeding**
  - **Endometrial hyperplasia** or even **endometrial carcinoma**
- In **prepubertal girls**:
  - **Precocious puberty**
- Less commonly:
  - **Virilization** (if the tumor produces androgens)

Fibroma

Definition:

Ovarian fibroma is a **benign**, **non-hormone-producing tumor** that originates from the **fibrous (connective) stroma** of the ovary.

Epidemiology:

- Most common in women aged **40 to 60 years**
- Accounts for approximately **4% of all ovarian tumors**

Morphology:

- Usually **unilateral**, **firm**, **whitish-gray** in color
- Has a **fibrous structure**
- Histologically composed of **spindle-shaped cells** and **collagen fibers**

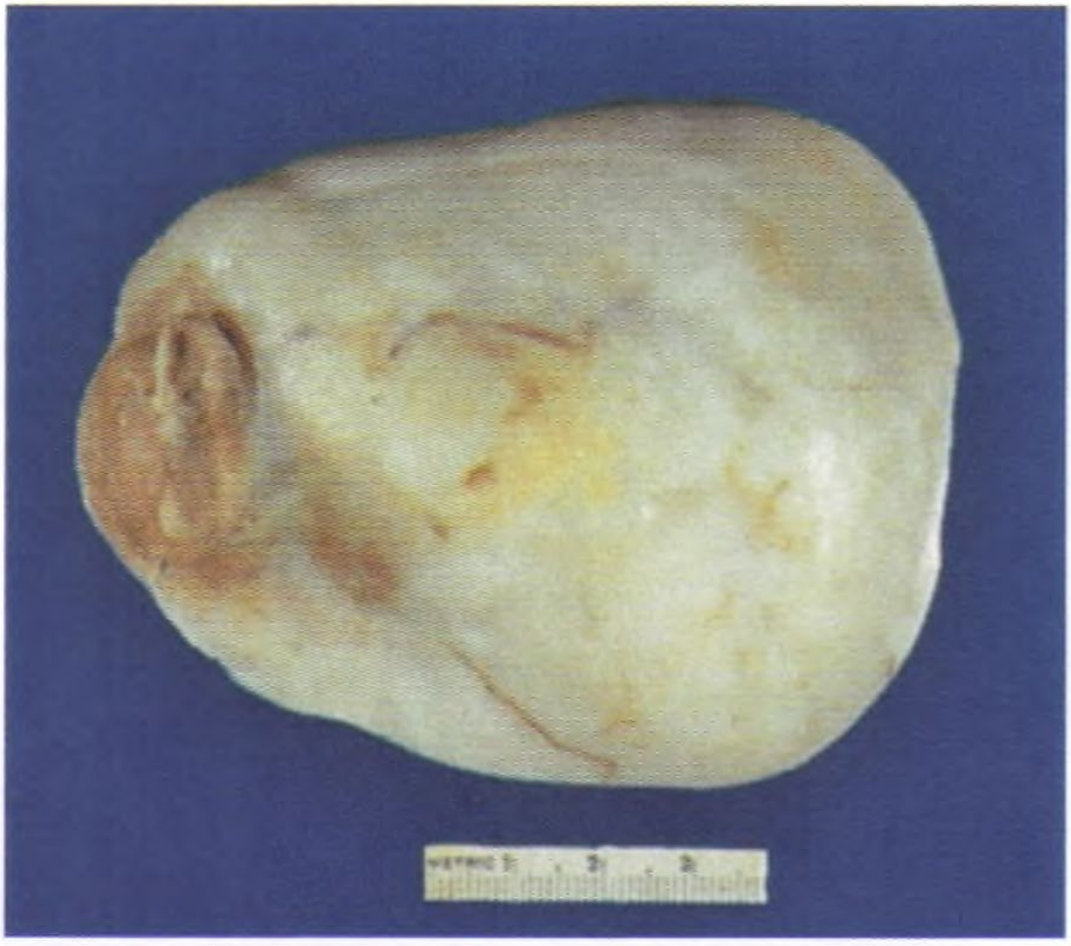

Figure 8.5. Ovarian fibroma

Clinical Presentation of Fibroma:

- Often **asymptomatic** and detected **incidentally** during **ultrasound** or **surgery**
- **Large tumors** may present with:
  - **Abdominal pain**
  - **Pressure symptoms** on adjacent organs
- Up to **40% of fibromas** are associated with:
  - **Ascites**, and occasionally
  - **Hydrothorax (pleural effusion)**
    → This combination is known as **Meigs syndrome**

Meigs Syndrome:

- **Ascites**
- **Pleural effusion** (most often right-sided)
- **Ovarian tumor** (typically a **fibroma**)
  → **Both ascites and pleural effusion resolve completely after tumor removal**

3. Androblastomas (Sertoli–Leydig Cell Tumors)

Definition and Morphology:

Rare tumors derived from **sex cord cells** — specifically **Sertoli and Leydig cells**.
More frequently observed in **young women**.
They exhibit **variable degrees of differentiation**.

Classification:

- **Well-differentiated**:
  - Sertoli cell tumor
  - Leydig cell tumor (Liesegang tumor)
- **Intermediate differentiation**
- **Poorly differentiated** (sarcomatoid)

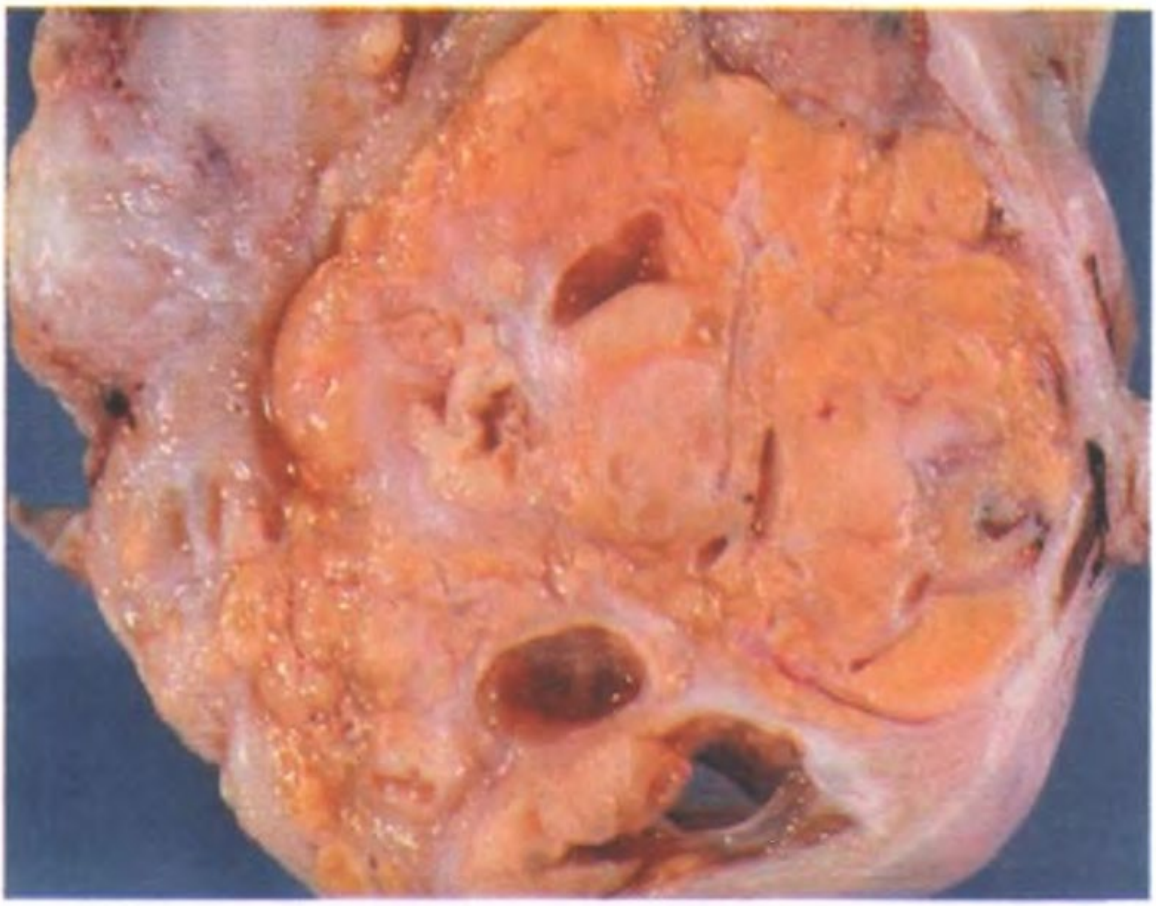

Figure 8.6. Androblastoma

Clinical Presentation of Androblastoma:

- **Androgen secretion → Virilization**:
  - **Menstrual irregularities**, up to **amenorrhea**
  - **Hirsutism**, **deepening of the voice**, **clitoral hypertrophy**
- In **well-differentiated forms**, **hormonal activity may be absent**

4. Gynandroblastoma

Definition:

A **rare tumor** containing elements of both **granulosa cells** and **Sertoli–Leydig cells**.
It exhibits clinical features of both **feminization** and **masculinization**.

Clinical Presentation:

Depends on the **predominant hormonal activity**:

- **Menstrual disorders**
- **Endometrial hyperplasia**
- **Androgen-dependent signs**

8.3. Secondary (Metastatic) Ovarian Tumors

Definition:

Secondary or metastatic ovarian tumors are neoplasms that develop in the ovaries as a result of **spread from malignant tumors of other organs**. They account for **5–30% of all malignant ovarian tumors**.

Common Primary Sites:

- **Stomach** (especially **signet-ring cell carcinoma**)
- **Colon and rectum**
- **Breast**
- **Pancreas**
- **Cervix and uterine corpus**

Routes of Metastasis:

- **Lymphatic spread**
- **Hematogenous spread**
- **Peritoneal implantation** (in carcinomatosis)
- **Direct anatomical extension** (e.g., via **utero-ovarian ligament** or **fallopian tubes**)

Krukenberg Tumor

Definition:

The **Krukenberg tumor** is a classic example of a **metastatic ovarian tumor**, typically representing **metastasis of a signet-ring cell adenocarcinoma** from the **stomach**, less commonly from the **intestines** or other organs.

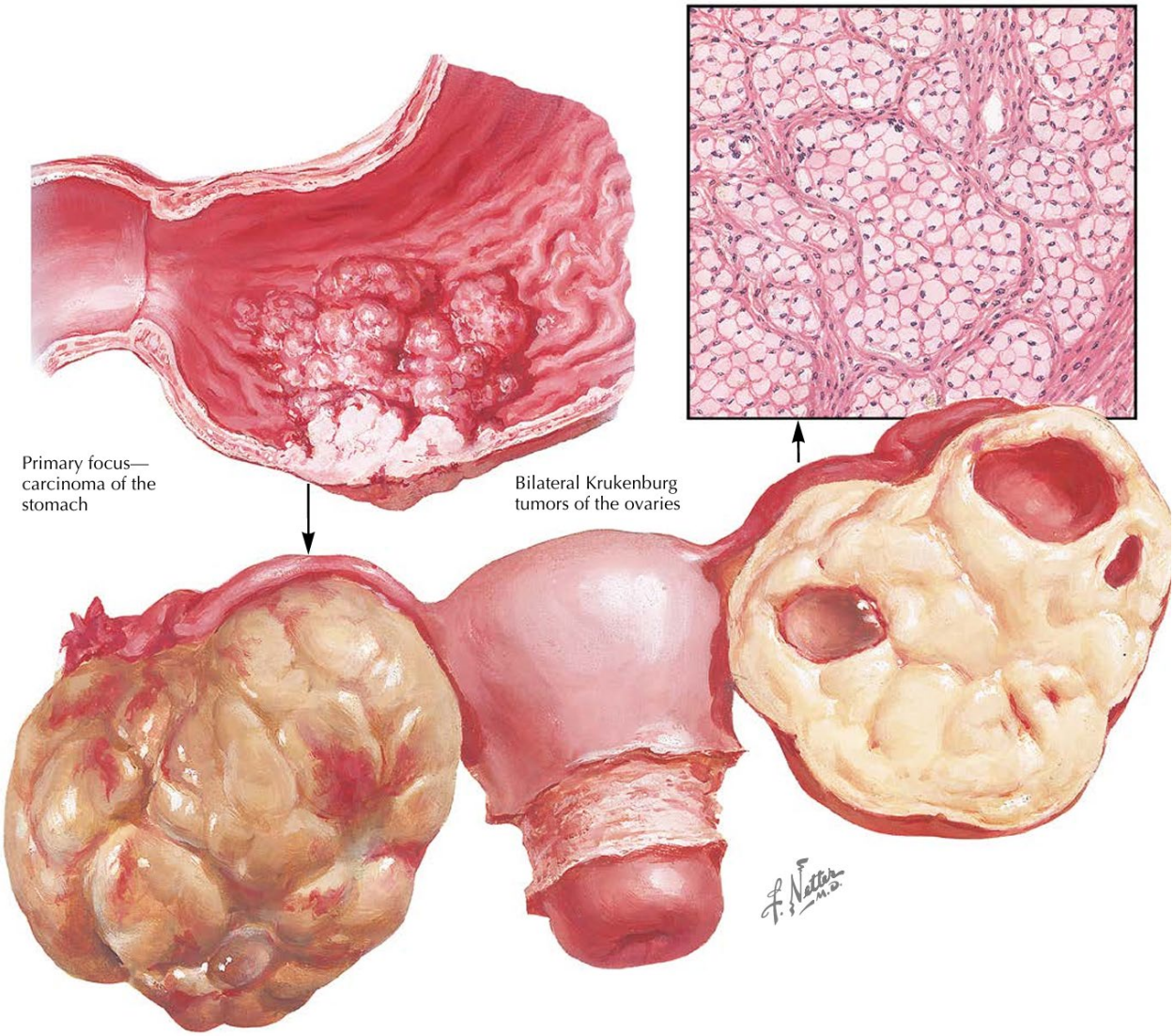

Figure 8.7. Krukenberg tumor

Morphology:

- **Bilateral involvement** of the ovaries
- **Solid, firm mass** with areas of **mucinous change**
- Presence of **characteristic signet-ring cells** containing **intracytoplasmic mucin**

Clinical Features:

- **Rapid growth** and **aggressive progression**
- Often diagnosed at **advanced stages**

- Common symptoms include:
  - **Lower abdominal pain**
  - **Ascites**
  - **Menstrual irregularities**
- May **mimic primary ovarian tumors**

Diagnosis:

- **Ultrasound and CT**: show **solid or solid-cystic**, usually **bilateral tumors**
- **Biopsy and histology**: identification of **signet-ring cells**
- **Immunohistochemistry**:
  - Confirms **gastrointestinal origin**
  - Positive markers: **CK20+, CDX2+**

Prognosis:

- **Poor**
- Krukenberg tumors are typically diagnosed at a **late stage** of the **primary malignancy**
- Average survival after diagnosis is **less than 2 years**

8.4. Ovarian Pseudotumors (Tumor-like Conditions)

Ovarian pseudotumors are **non-neoplastic masses** that **resemble tumors** clinically and radiologically, but **lack true neoplastic characteristics** — they **do not metastasize**, **do not invade** surrounding tissues, and are often **functional** and **reversible**.

Follicular Cysts

- Occur due to **failure of ovulation**
- Represent an **enlarged, unruptured follicle**
- Common in **reproductive-age women**
- Usually **asymptomatic**, but may cause:
  - **Irregular menstruation**

- **Lower abdominal pain**

- Typically **resolve spontaneously** within **1–2 cycles**

Corpus Luteum Cysts

- Form **after ovulation** from the **corpus luteum**
- Contain **serous** or **hemorrhagic fluid**
- May present with:
  - **Delayed menstruation**
  - **Pelvic pain**
  - Occasionally **rupture** and **intraperitoneal bleeding**
- Often **self-limiting** and **do not require treatment**

Endometriotic Cysts (Endometriomas)

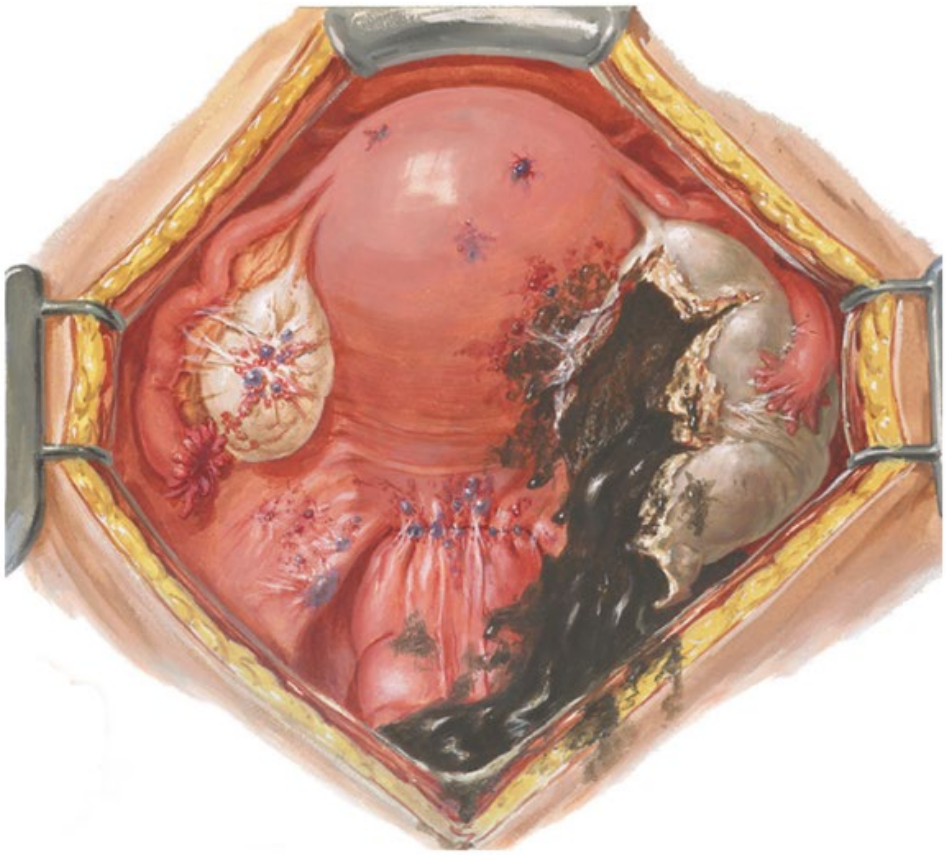

Figure 8.8. Endometriotic (Chocolate) Cyst

- Develop as part of the **ovarian form of endometriosis**
- Contain **thick, dark "chocolate-like" fluid** (degraded blood)

- Often associated with:
    - **Chronic pelvic pain**
    - **Infertility**
- **Surgical treatment** is indicated for:
    - **Large cysts**
    - **Ineffectiveness of medical therapy**

Paraovarian Cysts

- Arise from **embryonic remnants** (e.g., paramesonephric duct remnants)
- Located **between the layers of the broad ligament**, **outside the ovary**
- **Slow-growing**, **not hormonally dependent**, and **unrelated to the menstrual cycle**
- May require **surgical removal** if they become large

Theca–Lutein Cysts

- Associated with **ovarian hyperstimulation** by **human chorionic gonadotropin (hCG)**
    - e.g., in **hydatidiform mole** or **multiple pregnancy**
- Usually **bilateral and large**
- Tend to **regress spontaneously** after resolution of the underlying cause

Polycystic Ovaries

- Characterized by **multiple small follicular cysts** arranged **peripherally** around the ovary
- Part of **Polycystic Ovary Syndrome (PCOS)**
- Common features:
    - **Menstrual irregularities**
    - **Hyperandrogenism**
    - **Infertility**

Ovarian Stromal Hyperplasia

- May occur in **virilizing syndromes**, especially in **postmenopausal women**
- Characterized by **increased androgen production**
- Diagnosis is usually made **histologically**

Questions for the Chapter

I. Multiple-Choice Questions (Single Best Answer)

1. **Which of the following is the main factor in the development of benign ovarian tumors?**
   A) Hyperestrogenism
   B) Chronic endometritis
   C) Diabetes mellitus

2. **Which symptoms are most commonly seen in malignant ovarian tumors?**
   A) Abdominal distension, ascites
   B) Cramping pain
   C) Heavy bleeding

3. **Which of the following is a marker for malignant ovarian tumors?**
   A) CA-125
   B) Progesterone
   C) hCG

4. **Which diagnostic method is the most accurate for detecting malignant tumors?**
   A) Laparoscopy with biopsy
   B) Pelvic MRI
   C) Pelvic ultrasound

5. **Which type of tumor originates from germ cells of the ovary?**
   A) Teratoma
   B) Endometrioid tumor
   C) Serous cystadenoma

6. **What is characteristic of a benign ovarian tumor?**
   A) Limited growth with clear borders

B) Rapid metastasis
C) Invasive growth

7. **What complications are typical of benign ovarian tumors?**
   A) Torsion of the tumor pedicle
   B) Uterine perforation
   C) Infiltration into adjacent organs

8. **What is the primary treatment method for early-stage malignant ovarian tumors?**
   A) Surgical
   B) Chemotherapy
   C) Radiotherapy

9. **Which tissues are most commonly affected by metastases in ovarian cancer?**
   A) Peritoneum, liver, lungs
   B) Lymph nodes, kidneys, intestines
   C) Heart, muscles, skin

II. Open-Ended Questions (Extended Response Tasks).

1. Describe the main clinical manifestations of benign and malignant ovarian tumors.
2. What are the risk factors for the development of ovarian tumors?
3. How is the differential diagnosis between benign and malignant ovarian masses conducted?
4. What are the stages involved in the treatment of malignant ovarian tumors?
5. Explain the role of the tumor marker CA-125 in the diagnosis of ovarian tumors.

III. Case-Based Clinical Scenarios

Case №1

A 58-year-old woman presented with complaints of a feeling of heaviness and pain in the lower abdomen, bloating, loss of appetite, and general weakness. Over the past month, she noticed an increase in abdominal size. Medical history: menopause 8 years ago.

On examination: a tumor-like mass is palpable in the lower abdomen. Ascites is pronounced.
Ultrasound: bilateral masses in the ovarian area with irregular contours, hyperechoic inclusions, and moderate blood flow. CA-125 level: 890 U/mL.

Questions:

1. What is the preliminary diagnosis?
2. What diagnostic steps are needed to confirm the diagnosis?
3. What are the main treatment approaches?

Case №2

A 25-year-old woman was admitted urgently with complaints of sharp pain in the right iliac region that began 4 hours ago. The pain was accompanied by nausea, weakness, and cold sweat.
Medical history: irregular menstrual cycle.
On examination: tachycardia, marked tenderness in the lower right abdomen, tension of the anterior abdominal wall.
Ultrasound: a round hypoechoic mass in the right ovary, 8 cm in diameter, with significantly reduced blood flow.

Questions:

1. What is the likely diagnosis?
2. What emergency actions should be taken?
3. What is the prognosis for the patient?

Case №3

A 60-year-old woman presented with complaints of severe lower abdominal pain, chronic fatigue, and significant weight loss (10 kg over 3 months).
On examination: abdominal distension due to ascites, palpable solid tumor-like masses in the adnexal region.
Laboratory results: CA-125 — 1250 U/mL, albumin is decreased.
MRI of the pelvis and abdominal cavity: bilateral ovarian masses, metastases in the peritoneum and liver.

Questions:

1. What is the most likely diagnosis?
2. What diagnostic procedures should be performed?
3. What is the treatment plan and prognosis?

All supplementary self-assessment materials are available in the Telegram channel:

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Or scan the QR code:

Chapter №9. Congenital Anomalies and Malposition of Female Genital Organs

9.1. Congenital Anomalies of Female Reproductive Organs

Congenital anomalies are **developmental defects** of the reproductive system structures, most commonly associated with **abnormal fusion, resorption, or differentiation** of the **Müllerian (paramesonephric) ducts** during the embryonic period. These anomalies may affect the **uterus, vagina, fallopian tubes**, and **external genitalia**, and are often accompanied by **urinary tract malformations**.

Classification and Types:

1. Aplasia and Agenesis

- **Müllerian agenesis (Mayer–Rokitansky–Küster–Hauser syndrome)**:
    - Complete absence of the **uterus** and **upper one-third of the vagina**, with a **normal karyotype (46,XX)** and **functioning ovaries**
    - **Clinical features**:
        - **Primary amenorrhea**
        - Inability to have vaginal intercourse
        - Normal development of **breast tissue** and **pubic hair**
    - **Treatment**:
        - **Surgical neovaginoplasty** for sexual activity
        - **Assisted reproductive technologies** (e.g., **surrogacy**)

2. Hypoplasia (Genital Infantilism)

- Underdevelopment of the **uterus**, **cervix**, and **vagina**, often associated with **ovarian hypofunction**
- **Clinical features**:
    - **Amenorrhea**, **infertility**, **dysmenorrhea**
- **Treatment**:
    - **Hormone therapy**
    - **Vaginal plastic surgery**

- **Physiotherapy and physical exercises**

3. Fusion Defects of the Müllerian Ducts

- **Bicornuate uterus**: incomplete fusion resulting in two endometrial cavities
- **Arcuate (saddle-shaped) uterus**: mild fusion defect
- **Uterine septum**: failure of septal resorption between fused ducts
- **Uterus didelphys**: complete failure of fusion → two uterine bodies, two cervices, two vaginas
- **Clinical features**:
  - **Infertility**, **recurrent pregnancy loss**, **dysmenorrhea**
- **Diagnosis**:
  - **Ultrasound**, **MRI**, **hysterosalpingography (HSG)**, **laparoscopy**
- **Treatment**:
  - **Hysteroscopic septum resection**, **metroplasty**

4. Atresia (of the Vagina or Cervix)

- Obstruction due to **incomplete canalization** or **fusion of walls**
- **Clinical features**:
  - **Cryptomenorrhea** (hidden menstruation)
  - **Cyclic pelvic pain**, **hematometra**
- **Treatment**:
  - **Surgical restoration of patency**

9.2. Malposition of the Female Genital Organs

Malposition refers to **abnormal orientation** of the **uterus** and **vagina** within the pelvic cavity. These can be **congenital** or **acquired**. Clinically significant conditions include **uterine displacement** and **pelvic organ prolapse**.

1. Uterine Displacements

Retroflexion of the Uterus (Uterine Retroversion)

This refers to the **posterior displacement** of the uterine body relative to the cervix. It may be **congenital** or acquired due to **inflammatory diseases**, **surgery**, or **childbirth**.

Symptoms:

- Dull **lower back** and **pelvic pain**
- **Dysmenorrhea** (painful menstruation)
- **Dyspareunia** (pain during intercourse)
- Possible **difficulty conceiving**

Treatment:
Often **no treatment** is necessary. In symptomatic cases:

- **Pelvic floor exercises**
- **Physiotherapy**
- In severe cases or infertility — **surgical correction**

Anteflexion and Hyperanteflexion

Excessive forward angulation of the uterine body. Usually considered a **normal anatomical variant**, especially in **slender or asthenic women**.

May present with:

- **Painful menstruation**
- **Pressure on the bladder**

Management:

- **Observation only**
- No treatment unless symptomatic

Lateroflexion

Lateral displacement of the uterus. May result from **adhesions**, **tumors**, or **developmental anomalies**.

Clinical signs:

- Often **asymptomatic**

- Usually an **incidental ultrasound finding**

2. Uterine and Vaginal Prolapse (Pelvic Organ Prolapse)

This condition refers to the **downward displacement** of the **uterus** and/or the **vaginal walls** below their normal anatomical position. In severe cases, organs may **protrude beyond the vaginal introitus**.

Classification of Uterine Prolapse:

- **Grade I**: Cervix descends **toward the vaginal introitus**, but remains inside
- **Grade II**: Cervix **protrudes** outside the vaginal opening with straining
- **Grade III**: **Complete prolapse** of the uterus and vaginal walls

Associated Conditions:

- **Cystocele**: Prolapse of the **anterior vaginal wall** with bladder descent
- **Rectocele**: **Posterior vaginal wall** prolapse with the rectum
- **Enterocele**: Prolapse involving **small bowel loops**

Clinical Manifestations:

- Sensation of **pressure** or a **foreign body** in the vagina
- **Discomfort or pain** during walking or sexual activity
- **Urinary disturbances**: incontinence, retention
- **Defecatory dysfunction**
- **Chronic vaginitis** or **urethritis**

Etiology:

- **Pelvic floor muscle weakness**
- **Multiple childbirths**, especially with **trauma**
- **Estrogen deficiency** (e.g., in menopause)
- **Obesity**, heavy lifting
- **Chronic cough**, **constipation**

Treatment:

Conservative Therapy:

- **Kegel exercises** (pelvic floor muscle training)
- **Vaginal pessaries** (temporary mechanical support)
- **Hormone replacement therapy** in menopausal women

Surgical Options:

- **Pelvic floor reconstruction** (colpoperineolevatoroplasty)
- **Hysteropexy** or **hysterectomy** (in severe cases without reproductive plans)
- **Minimally invasive techniques** are widely used:
    - **Laparoscopy**
    - **Vaginal approach**
    - **Mesh implants**

9.3. General Aspects of Congenital Anomalies of the Female Reproductive System

Etiology and Pathogenesis

Congenital anomalies of the female genital tract arise due to:

- **Defective formation** of the Müllerian (paramesonephric) ducts
- **Impaired fusion** or **failure of resorption** of the intervening septum
- **Delayed or arrested embryonic development**
- **Genetic and chromosomal abnormalities**, e.g. **Turner syndrome**, **congenital adrenal hyperplasia**
- **Intrauterine infections**
- **Teratogenic exposures** (drugs, toxins, radiation) during **critical periods of gestation**

The **pathogenesis** of most anomalies involves **discoordination** between the development of the uterus, vagina, and the **urinary tract**. Thus, **concurrent urogenital malformations** are frequently observed.

Clinical Features and Peculiarities

The clinical presentation depends on the **type and severity** of the anomaly:

- **No symptoms** in minor forms (e.g., **arcuate uterus**, **retroflexion**)
- **Menstrual disorders**: primary amenorrhea, cryptomenorrhea, dysmenorrhea
- **Infertility and recurrent miscarriage**: typical in **septate**, **bicornuate**, or **unicornuate uterus**
- **Pelvic pain**: especially in obstructive anomalies or retroflexed uterus
- **Dyspareunia or inability to have sexual intercourse**: in vaginal agenesis or transverse septum
- **Pregnancy and labor complications**: malpresentation, preterm delivery, cesarean section

Diagnostic Approach

- **Ultrasound (US)** of the pelvis — both **transabdominal** and **transvaginal**: first-line imaging modality
- **MRI of the pelvis** — gold standard for evaluating **uterine morphology and internal architecture**
- **Hysterosalpingography (HSG)** — to assess uterine cavity shape and tubal patency
- **Hysteroscopy and laparoscopy** — combined diagnostic and therapeutic tools
- **Karyotyping** — indicated when a chromosomal anomaly is suspected
- **Renal ultrasound** — mandatory for all Müllerian anomalies due to high incidence of associated **urinary tract malformations**

Treatment Strategy

Depends on:

- **Anomaly type**
- **Age and symptoms**
- **Reproductive plans**

Conservative Management:

- Indicated for **asymptomatic anomalies**

Surgical Correction:

- **Septum resection** (hysteroscopic metroplasty)
- **Strassman metroplasty** — for bicornuate uterus
- **Neovaginoplasty** — in cases of vaginal agenesis (e.g., **Adamyan**, **McIndoe**, or **sigmoid colon vaginoplasty techniques**)

Assisted Reproductive Technologies (ART):

- **IVF**, **surrogacy** — for patients with **uterine agenesis** and **preserved ovarian function**

Questions for the Chapter

I. Multiple-Choice Questions (Single Best Answer)

1. **What type of developmental anomaly is uterine aplasia?**
   A) Complete absence of the uterus
   B) Bicornuate uterus
   C) Cervical stenosis

2. **What is characteristic of uterine retroversion?**
   A) Backward tilt of the uterine body
   B) Rotation of the uterus around its longitudinal axis
   C) Uterine prolapse

3. **Which diagnostic method is most informative in vaginal aplasia?**
   A) Pelvic ultrasound
   B) Laparoscopy
   C) Pelvic MRI

4. **What developmental anomaly is considered uterine duplication?**
   A) Failure of fusion of the paramesonephric ducts
   B) Cervical canal stenosis
   C) Underdevelopment of the endometrium

5. **What complication can accompany a bicornuate uterus?**
   A) Infertility and recurrent miscarriage

B) Endometritis

C) Pelvic organ prolapse

6. **Which congenital defect is associated with accumulation of menstrual blood in the vagina?**
   A) Hematocolpos
   B) Cervical aplasia
   C) Vaginal duplication

7. **What is the main cause of uterine retroflexion in adult women?**
   A) Chronic inflammatory diseases
   B) Congenital developmental defect
   C) Excess body weight

8. **What is the term for excessive forward bending of the uterus?**
   A) Hyperanteflexion
   B) Hyperretroflexion
   C) Retroversion

9. **What is the main treatment method for vaginal agenesis?**
   A) Plastic surgery
   B) Drug therapy
   C) Physiotherapy

II. Open-Ended Questions (Extended Response Tasks).

1. What are the main congenital malformations of the female reproductive organs, and what are their causes?
2. Describe the main diagnostic methods for abnormal positioning of the uterus.
3. Describe the clinical manifestations of uterine retroflexion and methods of treatment.
4. What complications can arise from congenital anomalies of the uterus and vagina?
5. What are the modern approaches to treating patients with uterine and vaginal aplasia?

III. Case-Based Clinical Scenarios

Case №1

A 19-year-old female presents with complaints of absent menstruation, dull lower abdominal pain, and inability to have sexual intercourse. Secondary sexual characteristics are normal: breast development is consistent with female pattern, and pubic and axillary hair are within normal limits. On examination, external genitalia are normally formed. Pelvic ultrasound reveals absence of the uterus and upper third of the vagina. CT shows both ovaries are of normal size and structure. The patient is experiencing significant emotional stress due to the diagnosis.

1. What is the likely diagnosis?
2. What investigations can confirm the diagnosis and rule out other conditions?
3. What are the main stages of treatment, including psychological support?

Case №2

A 28-year-old woman complains of cyclic cramping lower abdominal pain and spotting that does not correspond with her menstrual cycle. History: primary infertility. Pelvic ultrasound reveals uterine duplication. The right uterine horn has a thickened endometrium and signs of fluid accumulation (hematometra). The left horn connects to the vagina; its structure and endometrium are unremarkable.

1. What is the likely diagnosis?
2. What diagnostic methods can clarify the condition?
3. What are the treatment steps to relieve symptoms and restore fertility?

All supplementary self-assessment materials are available in the Telegram channel:

https://t.me/+_H6LveAOXTw1ZmYy

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ANSWERS TO THE TESTS

Chapter 1. Normal Menstrual Cycle and Its Regulation

Tests: 1 — b; 2 — a; 3 — a ; 4 — b; 5 — b; 6 — a; 7 — b; 8 — c; 9 — a;

Chapter 2. Menstrual Cycle Disorders

Tests: 1 — b; 2 — c; 3 — b; 4 — c; 5 — b; 6 — a; 7 — b; 8 — d; 9 — a;

Chapter 3. Abnormal Uterine Bleeding

Tests: 1 — b; 2 — b; 3 — c; 4 — b; 5 — a; 6 — b; 7 — d; 8 — a; 9 — b;

Chapter 4. Bleeding in the First Half of Pregnancy

Tests: 1 — b; 2 — a; 3 — a; 4 — a; 5 — c; 6 — b; 7 — c; 8 — b; 9 — a;

Chapter 5. Inflammatory Diseases of Female Genital Organs of Non-specific Etiology

Tests: 1 — b; 2 — c; 3 — c; 4 — a; 5 — c; 6 — a; 7 — b; 8 — a; 9 — b;

Chapter 6. Specific Inflammatory Diseases of Female Genital Organs

Tests: 1 — a; 2 — c; 3 — a; 4 — d; 5 — b; 6 — b; 7 — a; 8 — b; 9 — a;

Chapter 7. Uterine Fibroids

Tests: 1 — c; 2 — b; 3 — a; 4 — b; 5 — a; 6 — c; 7 — a; 8 — c; 9 — a;

Chapter 8. Benign and Malignant Ovarian Tumors

Tests: 1 — a; 2 — a; 3 — a; 4 — a; 5 — a; 6 — a; 7 — a; 8 — a; 9 — a;

Chapter 9. Developmental Anomalies and Abnormal Position of Female Genital Organs

Tests: 1 — a; 2 — a; 3 — c; 4 — a; 5 — a; 6 — a; 7 — a; 8 — a; 9 — a;

GLOSSARY

1. **Abortion** – termination of pregnancy before the fetus can survive outside the uterus
2. **Adenomyosis** – a common uterine condition where endometrial tissue grows into the muscular wall of the uterus
3. **Amenorrhea** – absence of menstruation for several cycles
4. **Anemia** – a deficiency of red blood cells in the body
5. **Aplasia** – complete absence of development of an organ or tissue
6. **Bartholinitis** – inflammation of the Bartholin's glands in the vagina
7. **Vaginal dysbiosis** – imbalance of the vaginal microflora
8. **Vaginitis** – inflammation of the vaginal mucosa
9. **Vulvitis** – inflammation of the vulva
10. **Endometrial hyperplasia** – thickening of the uterine lining (endometrium)
11. **Uterine hypertonus** – increased muscle tone of the uterus
12. **Hormone therapy** – treatment using hormones
13. **Dysmenorrhea** – painful menstruation
14. **Cervical dysplasia** – abnormal changes in the cells on the surface of the cervix
15. **Excretion** – elimination of fluid or substances from the body
16. **Estrogenic factors** – factors that contribute to breast cancer development
17. **Endometriosis** – condition where tissue similar to the endometrium grows outside the uterus
18. **Endometritis** – inflammation of the endometrium
19. **Diseases of the reproductive organs** – conditions affecting the reproductive system
20. **Breast diseases** – disorders related to the mammary glands
21. **Cervical diseases** – conditions affecting the cervix

22. **Ovarian diseases** – conditions affecting the ovaries
23. **Genital infections** – diseases caused by infectious agents in the reproductive organs
24. **Infertility** – inability to conceive a child
25. **Colpitis** – inflammation of the vaginal mucosa
26. **Lactation** – the process of producing and secreting milk after childbirth
27. **Leukorrhea** – vaginal discharge, often due to infection or inflammation
28. **Vaginal flora smear** – a test to examine vaginal microflora
29. **Mammography** – X-ray examination of the breasts
30. **Mastalgia** – breast pain or discomfort
31. **Menstrual cycle disorders** – deviations from the normal menstrual cycle
32. **Ovulation** – the release of an egg from the ovary
33. **Pap smear (cytology test)** – screening test for cervical cancer
34. **PMS (premenstrual syndrome)** – physical and emotional symptoms before menstruation
35. **Sexually transmitted infections (STIs)** – infections spread through sexual contact
36. **Postcoital contraception** – method of preventing pregnancy after sexual intercourse
37. **Preconception care** – preparation for pregnancy
38. **Recurrent miscarriage** – repeated pregnancy loss in early stages
39. **Contraceptives** – methods of preventing pregnancy

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