

**MINISTRY OF HEALTH OF UKRAINE
ODESSA NATIONAL MEDICAL UNIVERSITY**

International Faculty

Department of Obstetrics and Gynecology



CONFIRMED by
Vice-rector for scientific and pedagogical work
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**METHODICAL DEVELOPMENT FOR A PRACTICAL LESSON
IN ELECTIVE DISCIPLINE**

Faculty international, 6th year

Elective discipline "**ULTRASOUND DIAGNOSTICS IN OBSTETRICS AND
GYNECOLOGY**"

Practical lesson No1. Topic: "Fundamentals of ultrasound diagnostics of pelvic
organs in gynecology"

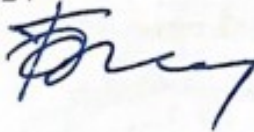
ONMedU, Department of Obstetrics and Gynecology. Practical Classes №1. Fundamentals of ultrasound diagnostics of the pelvic organs in gynecology.

Approved:

Meeting of the Department of Obstetrics and Gynecology
Odessa National Medical University

Protocol No1 of August 29, 2024

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Practical lesson No 1

Subject: «Fundamentals of ultrasound diagnostics of pelvic organs in gynecology».

Objective: Get acquainted with the basics of ultrasound examination of the pelvic organs in obstetrics and gynecology practice. Studying the general principles and concepts of ultrasound during examination. Mastering the physical foundations of ultrasound is necessary for working with ultrasound diagnostic equipment and modern approaches in ultrasound diagnostics. The ability to correctly interpret the results of an echogram and determine the ultrasound conclusion according to the ultrasound picture. Mastering knowledge of complex ultrasound research in the diagnosis of diseases of the female reproductive system. Understanding the relevance and expediency of using ultrasound diagnostics in the examination of gynaecological patients, which is due to the wide implementation of ultrasound echography, as a modern highly informative and accessible research method in obstetrics and gynecology, which allows ensuring a high-quality qualified level of medical care.

Basic concepts: Subject, tasks and methods of ultrasound diagnostics. The subject, tasks and methods of ultrasound diagnostics. The place of ultrasound diagnostics in the complex clinical examination of the gynaecological patients. Concept of ultrasonic research method. General characteristics of ultrasound diagnostic methods. Physical foundations ultrasound diagnostics. Biophysics of ultrasound. Components of ultrasound diagnostic systems. Conditions for ultrasound of reproductive organs. Methods and modes of ultrasound research: advantages and disadvantages of the ultrasound method. An examination plan and parameters for conducting an ultrasound examination of the pelvic organs are necessary.

Equipment: Professional algorithms, structural and logical schemes, tables, dummies, video-photo materials of ultrasound results, results of laboratory and instrumental studies, situational tasks, patients, medical histories.

I. Organizational measures (greetings, checking those present, communicating the topic, the purpose of the lesson, the motivation of higher education students to study the topic).

The relevance is due to the widespread introduction of ultrasound echography, as a modern highly informative and affordable method of research in obstetrics and gynecology, which allows providing a high-quality qualified level of medical care. Minimally invasive research, the absence of contraindications and the need for special training, the possibility of repeated use, if necessary, provides an opportunity to widely apply this method in the practical activities of doctors. Ultrasound diagnostics (ultrasound) in most cases of gynecological practice is the most reliable diagnostic method that allows doctors to recognize pathology in emergency conditions in a timely manner and identify pelvic neoplasms, identify the causes of abnormal uterine bleeding and infertility in women.

2. Control of the reference level of knowledge (written work, written testing, online testing, frontal survey, etc.). Requirements for knowledge:

- The ability to collect and interpret information about the disease received from the doctor, the patient, as well as from medical records.
 - The ability to identify medical indications and medical contraindications to the conduct of ultrasound.
 - ability to select methods of ultrasound research in accordance with the procedure for the provision of medical care, clinical recommendations (treatment protocols) on the provision of medical care, taking into account the standards of medical care
 - ability to actually prepare patient for ultrasound depending on the studied anatomical branch
 - the ability to compare the data of the ultrasound picture with the results of the clinical and laboratory examination of the patient
- List of didactic units:

- ☐ Ultrasound - ultrasound examination
- ☐ Echogenicity
- ☐ Echogenicity
- ☐ Artefact
- ☐ Acoustic shadow
- ☐ Acoustic beam
- ☐ Acoustic window ☐ Wavelength ☐ Echostructure of the organ
- ☐ Doppler effect

2.2. Questions (test tasks, tasks, clinical situations) to test basic knowledge on the topic of the lesson.

Question:

1. Types of gynecological ultrasound according to the method of conduct.
2. Ultrasonic image information presentation modes.
3. Ultrasound picture of normal anatomy and biometrics of pelvic organs.
4. Features of the echocardiogram of the state of the uterus and ovaries in the first phase of the menstrual cycle.
5. Features of the echocardiogram of the state of the uterus and ovaries in the second phase of the menstrual cycle.
6. Ultrasound features of the condition of the uterus and ovaries in the postmenopausal period.
7. Ultrasound diagnosis of congenital malformations features of the classification according to ESHRE.
8. Ultrasonic picture of vaginal anomalies.
9. Ultrasonic criteria for doubling the uterus and vagina.

10. Ultrasound picture of the saddle uterus and T-shaped uterus

Situational tasks:

Task 1.

Patient R., 19 years old, turned to the gynaecologist with complaints about the absence of menstruation for 10 days. From the history of the menstrual cycle is not regular. According to the ultrasound examination: the uterus is in anteflexio position, size is 38x29x39,2 mm. The echostructure of the myometrium is homogeneous. Endometrium: vaguely differentiated from the myometrium, thickness 4 mm, visualized throughout, echostructure homogeneous. The right ovary is 32.6x23.1x32.2 mm, the volume is 12.7 ml, and the echostructure is finely follicular. Left ovary: 31.3x26.4x32.2 mm, volume 14 ml, echostructure is finely follicular. Establish a preliminary diagnosis according to the ultrasound picture.



Answer: The ultrasound picture does not correspond to the MC phase. Insufficiency of the luteal phase of the menstrual cycle. Ultrasound picture of the multifollicular ovaries. Patient needs to exam the hormonal profile.

Task 2

Patient Z., 30 years old, turned to a gynaecologist with complaints of moderate pain in the lower abdomen. There is a history of the last menstruation 14 days ago; the menstrual cycle is regular – 5-6/28-30, not painful. B=0, P=0, A=0. Gynecological history is not burdensome. Sexual contact with prevention is a condom. According to the ultrasonic picture: Uterus: state of anteflexio, 46.1x37.4x52 mm. The echostructure of the myometrium is homogeneous. The thickness of the myometrium on the front wall is 15.2 mm, on the back 15.3 mm. Endometrium: clearly differentiated from myometrium, thickness 8.5 mm, secretory type. The cervix is 28.7x23.9 mm long, homogeneous echostructure. The right ovary is 30.9x24.3x27.1 mm, the echostructure is finely follicular. The left ovary is 36.7x30.6x27.6 mm, the echostructure is fine-follicular, and an anechogenic cystic formation of 21.4x20.5 mm (dominant follicle) is visualized at the lateral pole of the ovary. Establish a preliminary diagnosis according to the ultrasound picture.



Answer: The ultrasound picture corresponds to the phase of the menstrual cycle. Ultrasound signs of ovulation.

Test tasks:

- What phase of the menstrual cycle corresponds to the thickness of the myometrium of 6-8 mm, the secretory type?
 - The first phase of MC – 1-9 days
 - Ovulation phase MC – 10-15 days
 - The second phase of MC – 16-24 days
 - Menopause
- In which ultrasound scan is it advisable to measure the thickness of the anterior and posterior skin of the uterus?
 - Cross section (axial section)
 - Longitudinal echographic section (sagittal scan)
 - Side left scan
 - Side right scan
- Ultrasound examination of the pelvic organs in gynecology is not used for:
 - Determination of the position of the uterus
 - Determination of ovarian structure
 - Determination of the structure of the fimbriae of the fallopian tubes
 - Determining the size of the body and cervix
 - Assessment of the thickness and structure of the uterine mucosa

Correct answers: 1 – C; 2 – A; 3 – P.

1. Formation of professional skills and abilities (mastering skills, conducting examination of the patient, determining the treatment regimen, conducting laboratory research, etc.).

— **The content of the tasks (tasks, clinical situations, etc.).**

Interactive task:

Students of the group are divided into 3 subgroups in the amount of 4-5 people each. We work in ultrasound diagnostic rooms with pregnant patients, we give tasks:

And the subgroup – assessment of the patient, history taking

Ii subgroup – advising the patient according to ultrasound screenings

Subgroup III-th – evaluates the correctness of the answer of the I-th and II-th subgroups and makes its own adjustments.

Clinical tasks:

Task 1

A woman of 42 years old turned to the antenatal clinic with complaints of prolonged and heavy menstruation for 8 months, aching pain in the lower abdomen, weakness. During gynecological examination, the body of the uterus is increased to 11-12 weeks of pregnancy, dense, limited in movement, painless. In a blood test: Hb=90 g/l.

Task: Determine the tactics of the doctor and make a plan of diagnostic studies

Answer: Transvaginal ultrasound examination of the pelvic organs.

Task 2

A girl of 8 years old turned to an appointment with a paediatric gynaecologist with complaints n a bleeding from the genital tract for 2 days. From the anamnesis: she was born premature, at the age of 5 she suffered measles, rubella. The development of secondary sexual characteristics began at the age of 6. Objectively: the correct physique, height 140 cm, weight 40 kg. Somatic development corresponds to 12 years of age. Inspection of the external underlying organs: developed correctly, about hair according to the female type. Vaginal discharge is moderate, bloodies. Rectally: the body of the uterus is deflected to the front, more age or more, dense, painless. Appendages are not defined.

Task:

1. What is the most likely diagnosis?
2. The required amount of research to determine the diagnosis
3. What treatment is advisable to prescribe in this case?

Answer:

1. Premature sexual development (PSP) of is sexual type, full form.
2. Ultrasound of the pelvic organs, study of the levels of FSH, LH, Estradiol, CT of the pituitary gland.
3. In the absence of hormone-producing tumours, moderate levels of pituitary and ovarian hormones, the constitutional type of PS P is observation.

Test tasks:

1. On which day of the menstrual cycle is it most advisable to conduct an ultrasound examination of the pelvic organs during a routine examination of the patient?
 - A. 6-7 day MC
 - B. 13-15 day MC
 - C. 22-24 day MC
 - D. 29-30 day MC
2. With ultrasound examination of the patient in the second phase of the menstrual cycle, the endometrium has the form:
 - A. Three-layer
 - B. Secretory
 - C. Homogeneous
3. What are the sizes of the uterus that correspond to its hypoplasia?
 - A. 44×37×43 mm.
 - B. 51×39×50 mm
 - C. 40×27×30 mm
 - D. All answers are correct.

Correct answers: 1 – A, 2 – B, 3– C.

— **Recommendations (instructions) for the implementation of tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.).**

Ultrasound examination (ultrasound) is today one of the most popular procedures in all branches of medicine. Ultrasound is the simplest, safest and one of the most accurate methods for studying the structure of organs, and that is why it is so widespread.

Indications for gynecological ultrasound are:

- inflammatory diseases of the female reproductive system: ultrasound allows you to identify signs of inflammation of the uterus (endometritis) and its appendages (salpingoophoritis, adnexitis), to detect exudate in the abdominal cavity, which may indicate an infectious or other lesion of the pelvic organs;
- diagnosis of the duration of pregnancy, determining the location of the ovum (in the uterus or outside it), the threat of interruption, frozen pregnancy;
- malignant and benign neoplasms: uterine fibroids, endometriosis, endometrial cancer, cysts and ovarian cystoma, etc.;
- dynamic monitoring of the follicular apparatus of the ovaries, determination of the period of ovulation during pregnancy planning;
- dynamic monitoring of existing gynecological disease;
- control over the correct location of the intrauterine device;

- dyshormonal diseases and pathological processes: endometrial hyperplasia and polyps, polycystic ovary, cervical pathology;
- control over the development of the fetus, the state of the uterus and placenta during pregnancy, dopplerometry of the blood flow of the uterus, fetus, uterus-fetus system;
- periodic preventive examinations;
- Dopplerometry of tumors of the uterus, ovaries, etc.

Gynecological ultrasound does not take much time, allow you to get the most detailed information about the state of the female genital organs.

Types of gynecological ultrasound according to the method of conducting: In accordance with the method of conduct, the following types of ultrasound are used in gynecological practice:

- Transabdominal: the examination is carried out through the abdominal wall. The sensor of the ultrasound scanner moves along the surface of the abdomen. The most commonly used method does not require prior preparation, except for filling the bladder. Allows you to determine the size of the female genital organs, their structure, the presence or absence of large pathological neoplasms (tumors, cysts, etc.);
- Transvaginal: carried out by a special sensor that is inserted directly into the vagina. The method is more informative, allows you to study in detail the structure of organs, the shape, size and structural features of tumors;
- Combined: a transabdominal scan is performed with a full bladder, after emptying it, the study is continued Transvaginal.

The type of ultrasound is chosen by the doctor depending on the available indications and the objectives of the study.

2D, 3D and 4D ultrasound: modern technologies in gynecological studies

The method of ultrasound in medical practice has been used for more than 50 years. Modern equipment is distinguished by its power and informativeness. Diagnostics is carried out using various technologies:

2D ultrasound: the simplest equipment that allows you to obtain a conventional two-dimensional ultrasound image of the internal female genital organs, to identify and measure the size of the ovaries, ovum, the place of its implantation, the peculiarities of the development of the embryo or fetus, its internal organs, limbs, etc. For a specialist, 2D ultrasound is an informative and accurate diagnostic method, it is affordable for patients. This method is used in pregnancy and gynecology;

3D ultrasound: unlike a two-dimensional study, which gives only a flat image, 3D ultrasound allows you to get a three-dimensional picture. Tissue scanning takes place in three planes. After processing the obtained data, the computer program builds a 3D image. Due to this, it is possible to assess in more detail the condition of the internal female organs, to diagnose the disease at an earlier stage. For example, a conventional gynecological ultrasound allows you to see tumors from 6–7 mm, and 3D — from 3–4 mm. If we are talking about examination during pregnancy, then on the screen or photo you can see the realistic outlines of the body of the fetus, assess its size and developmental features.

Ultrasound examination of the uterus and ovaries.

The position of the uterus. The uterus can be rotated in such a way that the body of the uterus is determined by the cervix (the state of retroversio). The body of the uterus can be rejected in advance (anteversio). If the body of the uterus is tilted towards the cervix, it is in anteflexio. If the body of the uterus is tilted back from the cervix, this condition is called retroflexio.

Transabdominal ultrasound examination of the uterine appendages is carried out by convex or sector sensors of 3.5 – 5 MHz scanning are performed above the pubic area. The patients are located in the supine position during the examination. The main plane of the cut in the study of the appendages is the cross section, obtained when the scanning surface of the sensor is positioned with an axis length perpendicular to the midline of the abdomen, as well as an oblique cut.

Follicles are visualized as small-cystic anechogenic structures in the thickness of the ovary or along its periphery and are better visualized when setting a low level of sensitivity of the device. Depending on the phase of the menstrual cycle, cystic structures can reach 25 cm in diameter. Simple cysts with a diameter of more than 5 cm can be physiological and may change, become smaller or disappear

Position of the ovaries: the ovaries are located near the lateral walls of the pelvis, near the site of division of the common iliac artery into external and internal, only at the level of the uterine angles of the uterus, but can be determined behind the uterus, as well as at the lateral edges of the body and cervix. The shape of the ovaries is ellipsoidal, flattened in the anteroposterior direction.

The contours of the ovaries are smooth, clear.

The size of the ovaries in a woman in the reproductive period: length 25 – 40 mm, width 15 – 25 mm, thickness 15 – 20 mm.

By puberty, the ovaries are sizes: length

15-25 mm, width 15-20 mm, thickness 10-15 mm.

The size of the ovaries during menopause decreases: length 15 – 25 mm, width 15 – 20 mm, thickness 10 – 15 mm.

Ovarian tissue consists of stroma. The cortical and cerebral layers in the functioning ovaries are visible. The cortical layer has the form of a marginal hypoechoic rim about 5 mm wide; the medulla of the ovary is visualized as an isoechoic central zone. The cortical substance of the ovary contains follicles of varying degrees of maturity: one, less often two dominant (maturing) follicles, reaching a diameter of 20–25 mm before ovulation, and 5–10 antral follicles with diameters of 2–6 mm.

Follicles are visualized as small-cystic anechogenic structures in the thickness of the ovary or along its periphery and are better visualized when setting a low level of sensitivity of the device. Depending on the phase of the menstrual cycle, cystic structures can reach 25 cm in diameter. Simple cysts with a diameter of more than 5 cm can be physiological and may change, become smaller or disappear

Postmenopausal pelvic research

1. Uterus. In postmenopausal women, the uterus becomes much smaller in size and more homogeneous in echostructure: the endometrium is not traced.
2. Postmenopausal ovaries. The ovaries are small and it is often very difficult or impossible to visualize them with ultrasound. In the event that they are still visualized, they look hyperechogenic, without follicles and often almost isoechoic surrounding tissue.

Anomalies of the female genital organs

Anomalies of the female genital organs include congenital violations of the anatomical structure of the genitals in the form of incomplete organogenesis: deviation of size, shape, proportions, symmetry, topography; availability formations not characteristic of the female sex in the postnatal period. To anomalies in the broadest sense of the word, postnatal developmental delay can also be attributed correctly formed (in the antenatal period) genitals, this observed in infantilism. These purely anatomical disorders are usually accompanied by a functional disorder. The process of formation of the genital organs includes three main stages:

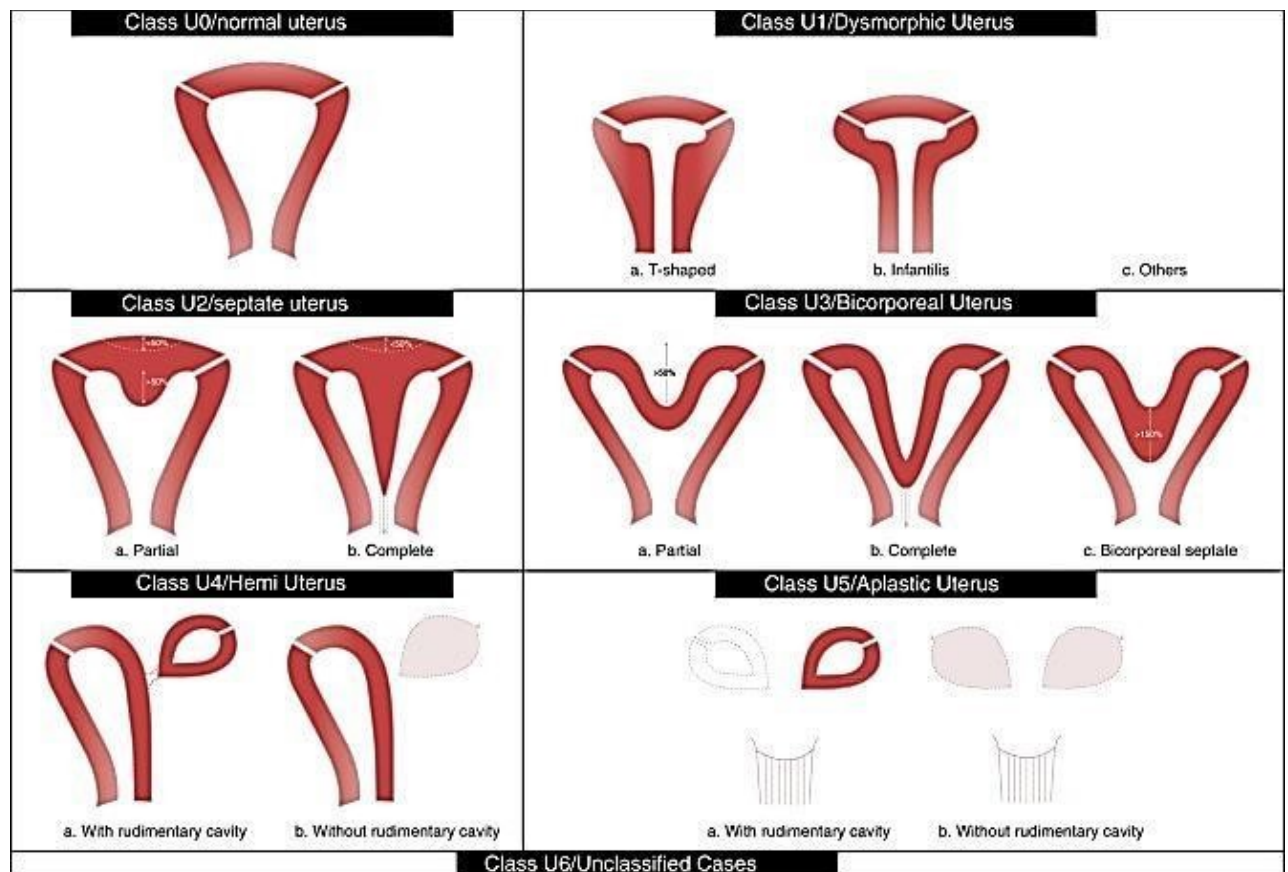
- Organogenesis: the source of both Muller ducts;
- fusion: the lower parts of the Müllerian ducts merge, the upper third of the vagina, cervix and body of the uterus are formed; fallopian tubes are formed from the upper part of the Müllerian ducts. The fusion of the paramesonephric ducts begins at the end of the 6th week and ends by the 12-13th week of intrauterine development. The result of the merger of the paramesonephric ducts is the formation of two uterine-vaginal cavities, which are separated by a sagittal median septum;
- Resorption of the septum after 9 weeks with the formation of one cavity and cervix.

The uterus is formed at about 8-16 weeks of intrauterine development of the fetus. Most often, doubling of the uterus occurs at the 8-9th week, the two-horned uterus – at the 10-14th week, the intrauterine septum – at the 11-16th week of pregnancy. The morphogenesis of the ovaries is completely independent of the differentiation of the Müllerian duct; therefore, in women with Müllerian anomalies, the ovaries function normally. As it develops, the ovaries are displaced along with the fallopian tubes into the pelvic cavity. Lowering the ovaries is accompanied by a change in the direction of the fallopian tubes, which from vertical approaches the horizontal.

Classification of anomalies of the female genital organs

Congenital malformations differ in etiological basis, sequence of occurrence in the body, time of influence of teratogenicity factor and localization. There is no single classification of congenital malformations of the reproductive system. Diagnostic and therapeutic approaches vary due to the diversity of the defects themselves, their combinations and clinical manifestations. Among the analysed classifications of anomalies in the development of the female genital organs, the ESHRE/ESGE system stands out for its practicality and consistency.

The creation of this classification was a significant advance in understanding the time often embryogenesis, leading to anomalies in the development of the uterus and vagina, but the AFS classification has a number of drawbacks: rather cumbersome, reflects not all variants of anomalies in the development of the female reproductive system, in particular, it does not present the so-called «obstructive» anomalies associated with impaired outflow of menstrual blood.



Ultrasound of the internal genitalia documents the correct interpretation of clinical data. The study is carried out with a filled bladder with the location of the sensor above the bosom and in the perineum. At the same time, the organs of the abdominal cavity and retroperitoneal space are examined. Ultrasound allows you to probably determine the size of the uterus and its cavity, the thickness of the endometrium, the size and thickness of the walls of the hematocolpos, the distance from its bottom to the skin of the perineum. At the same time, the probability of ultrasound is quite high only in the diagnosis of the simplest forms of malformation – low vaginal atresia without doubling the organs. In all doubtful cases – if the history data, clinical picture and examination results differ, ultrasound data should be checked by other methods – endoscopy, magnetic resonance imaging (MRI). In some observations, laparoscopy and vaginography are the most informative.

Saddle uterus

The saddle uterus is a mild form of developmental disorder. The shape of the saddle is sometimes associated with the shape of the heart. It is characterized by a small intrauterine indentation, thinner than 1 cm and located in the area of the bottom of the uterus. It is formed as a result of almost complete resorption of the septum. As a rule, the T-shape uterus is a find during 3D ultrasound. Endometrium with the saddle uterus is fully healthy and suitable for embryo implantation. There may be certain risks during pregnancy, which requires additional vigilance for the obstetrician-gynaecologist during pregnancy. The two-horned uterus is a congenital

malformation in which the uterus has an irregular shape, that is, it is divided into two, so-called "horns", two separate cavities, which in the lower part converge into one. The size and location of 2 cavities relative to each other may be different. In some cases, one of the cavities of the uterus may be underdeveloped, rudimentary.

The two-horned uterus is formed when the Muller ducts incompletely merge at the level of the bottom of the uterus. The uterus with a septum is the result of incomplete resorption of the middle septum after the complete correct fusion of the Muller ducts. Externally, the uterus looks normal, but inside there is an intramuscular septum consisting of non-elastic tissue with poor blood supply.

Doubling of the uterus is a disorder that results in the formation of two separate uteri. It occurs when the two ducts of Muller did not merge into one and did not form one uterus, and as a result, two uteri began to develop from each duct. Such a defect is usually limited to two bodies of the uterus (one fallopian tube departs from each) and doubling of the cervix. In addition, there is sometimes doubling of the vagina, bladder, urethra, anus and vulva. The unicorn uterus is the rarest disorder of the development of the uterus, is a uterus with a single horn, from which one fallopian tube departs. It is formed when one Muller Strait is completely absent, while the other develops normally. The anomaly may be accompanied by the absence of the ovary and kidney on the opposite side.

Requirements for the results of work, including design.

1. Consult the patient, identify the leading symptoms and complaints on appeal, and detail the history data necessary for ultrasound.
2. Explain the need for ultrasound examination to the patient, choose the most appropriate method of ultrasound for the patient
3. Describe the picture of dynamic ultrasound
4. Evaluate the results of ultrasonic echograms of the patient and form an ultrasound conclusion
5. Determine the further tactics of patient management and the need for additional examination

— Control materials for the final stage of the lesson: tasks, tasks, tests, etc.

Situational tasks:

A 16-year-old girl has blood discharge from the genital tract, which lasts for 8 days after a 2-month delay. The first menstruation appeared 4 months ago for 2 days after 28 days, moderate, painless. Sex life denies. The development is correct, well physically folded. During recto-abdominal examination, no pathology was detected. Hb - 80 g/l.

Question

1. Diagnosis.
5. What examinations should be carried out to verify the diagnosis?

Answer.

1. Abnormal uterine bleeding - juvenile
2. Transabdominal ultrasound diagnosis of the pelvic organs.

Test tasks KROK-2 (2021):

1. A 23-year-old girl turned to an obstetrician-gynaecologist with complaints about the absence of menstruation for 3 months, a rash on the face and neck, excessive hair growth on the chin, in the para-nasal areas that have been disturbing for 3 years. According to the results of ultrasound examination of the pelvic organs, ultrasound signs of multifollicular echostructure of the ovaries, hypoplasia of the uterus 1 tbsp. 1 What is the most likely diagnosis:
 - A. Hormone-producing ovarian tumour.
 - B. Polycystic ovary syndrome.
 - C. Uterine fibroids.
 - D. Cervical polyp.
 - E. Polycystic ovary syndrome.*

4. Summing up (criteria for evaluating learning outcomes).

Current control: oral questioning, testing, evaluation of practical skills, solving situational clinical problems, evaluation of activity in the classroom, etc. ***The structure of the current assessment in the practical lesson:***

1. Evaluation of theoretical knowledge on the topic of the lesson:
 - methods: survey, solving a situational clinical problem;
 - The maximum score is 5, the minimum score is 3, and the unsatisfactory score is 2.
2. Assessment of practical skills and manipulations on the topic of the lesson:
 - methods: assessment of the correctness of practical skills;
 - The maximum score is 5, the minimum score is 3, and the unsatisfactory score is 2.
3. Evaluation of work with the patient on the topic of the lesson:
 - methods: assessment of: a) communication skills of communication with the patient, b) the correctness of the appointment and evaluation of laboratory and instrumental studies, c) compliance with the algorithm for conducting a differential diagnosis d) justification of the clinical diagnosis, e) drawing up a treatment plan;
 - The maximum score is 5, the minimum score is 3, and the unsatisfactory score is 2.

Criteria for the current assessment in a practical lesson:

Score	Evaluation criteria
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«5»	The student is fluent in the material, takes an active part in the discussion and solution of a situational clinical problem, confidently demonstrates knowledge of ultrasound screening diagnostics in obstetrics and the correct appointment of laboratory and instrumental studies, expresses his opinion on the topic of the lesson, demonstrates clinical thinking.
«4»	The student is well versed in the material, participates in the discussion and solution of a situational clinical problem, demonstrates knowledge of ultrasound screening diagnostics and the correct appointment of laboratory and instrumental studies with some errors, expresses his opinion on the topic of the lesson, demonstrates clinical thinking.
«3»	The student does not have enough knowledge of the material, uncertainly participates in the discussion and solution of a situational clinical problem, and demonstrates knowledge of ultrasound screening diagnostics and the correct appointment of laboratory and instrumental studies with significant errors.
«2»	The student does not own the material, does not participate in the discussion and solution of a situational clinical problem, and does not demonstrate knowledge of ultrasound screening diagnostics and the correct appointment of laboratory and instrumental studies.

List of recommended literature.

Main:

1. Obstetrics and Gynecology: in 2 books. - Book 2. Gynecology: textbook (university III-IV r.a.) / ed. V.I. Gryshchenko, M.O. Shcherbyna - 3rd ed., vypr., 2020. – 376 s
2. Clinical Obstetrics and Gynecology: 4th Edition/ Brian A. Magovan, Philip Owen, Andrew Thomson. – 2021. – 454 p.
3. National approaches to the implementation of the system of regionalization of perinatal care in Ukraine (practical guidelines) // Digest of professional medical information. — 2012. — № 48—49. — pp. 1–59.
4. ISUOG Practice Guidelines: use of Doppler ultrasonography in obstetrics // Ultrasound Obstet. Gynecol. — 2013. — Vol. 41. — P. 233—239.
<http://dx.doi.org/10.1002/uog.12371>; PMID:23371348
5. Callen P.W. Ultrasonography in Obstetrics and Gynecology / P.W. Callen. — Elsevier Health Sciences, 2011. — 1180 p.
6. Avramenko N. V., Barkovsky D. E. Anomalies in the development of the genital organs in girls and methods of their correction. Bulletin of the problems of biology and medicine. 2018; 1(142): 16-20

7. Oxford Textbook of Obstetrics and Gynecology / Sabaratnam Arulkumaran, William Ledger, Lynette Denny, Stergios Doumouchtsis – Oxford University Press, 2020, 928 p.
8. The ESHRE/ESGE consensus on the classification of female genital tract congenital anomalies Grigoris F Grimbizis, Stephan Gordts, Attilio Di Spiezio Sardo, Sara Brucker, Carlo De Angelis, Marco Gergolet, Tin-Chiu Li, Vasilios Tanos, Hans Brölmann, Luca Gianaroli, Rudi Campo Affiliations expand PMID: 23771171, PMCID: PMC3712660, DOI: 10.1093/humrep/det098 **Additional:**
 1. Workshop on Gynecology / A. M. Vavilova – K. : "Medicine", 2019. – 96 p.
 2. Clinical Obstetrics and Gynecology / A. Brian, Magovan, Philip Owden, Andrew Thomson; scientific editor of translation M. Shcherbyna - K. : "Medicine", 2021. – 512 p.
 3. *Situational tasks in gynecology: a textbook. / I.Z.Gladchuk, A.G.Volyanska, G.B.Shcherbyna and others.; ed. prof. I.Z.Gladchuk. – Vinnytsia: LLC "Nilan-LTD", 2018.-164 p.*
 4. *September N. S. The effect of a unicorn uterus on the reproductive health of a woman. Bulletin of V. N. Karazin Kharkiv National University. Series "Medicine". 2019; 38: 63-71. DOI: <https://doi.org/10.26565/2313-6693-2019-38-08>.*
 5. *September N. C., Pirogova V.I. Prevention of reproductive disorders in women with abnormalities in the development of the genital organs. Bulletin of V. N. Karazin Kharkiv National University. Series 237 "Medicine". 2020; 40: 99-107. DOI: <https://doi.org/10.26565/23136693-2020>.*
 6. *Acien P, Acien MI. The history of female genital tract malformation classifications and proposal of an updated system. Hum Reprod Update 2011;17:693 – 705.*
 7. *Current "Clinical Protocols", approved by the order of the Ministry of Health of Ukraine on obstetrics and gynecology.*

Online sources for preparation:

1. Practical recommendations of the International Society of Ultrasound in Obstetrics and Gynecology (ISUOG). Internet: www.isuog.org/ISUOGGuidelines
2. Ultrasound protocols. Internet-resource: Ukrainian portal of ultrasound diagnostics. Internet-resource: <http://ultrasound.net.ua/>
4. <https://www.cochrane.org/>
3. <https://www.ebcog.org/>
4. <https://www.acog.org/>
5. <https://www.uptodate.com>
6. <https://online.lexi.com/>

7. <https://www.ncbi.nlm.nih.gov/>
8. <https://pubmed.ncbi.nlm.nih.gov/>
9. <https://www.thelancet.com/>
10. <https://www.rcog.org.uk/>
11. <https://www.npwh.org/>