

Morphometric and Histological Analysis of Endometrial Tumors in Women of the Pre-Menopausal Period

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Annotation: Histological examination of biopsy material is of particular importance in gynecology. It not only allows you to study the tissues of the cervix and the body of the uterus, but also gives you the opportunity to get accurate information about the condition of the unborn baby.

Keywords: heavy discharge, endometrioid and follicular cysts, pathological process, inflammatory changes

Introduction: This diagnostic method is necessarily used after a miscarriage or termination of a frozen pregnancy. This allows you to identify the causes of the pathology and take measures for prevention in the future.

In addition, histology is performed for women suffering from an increase in the period of menstruation, heavy discharge, pain in the lower back and lower abdomen. In cases of suspected inflammatory diseases, tumors, warts, dysplasia

and a number of other diseases, such an analysis is also an integral part of diagnostic measures. Histology of ovarian tissue is performed to determine the type of tumors.

A biopsy with histological examination is the main method of obtaining the material. It can be performed as a result of surgical intervention and is called an incisional biopsy. Excision is the study of a tumor or part of a tissue completely removed surgically.

Sampling outside of surgery is performed using tweezers, a needle or a small tube, curettes, tools for sampling a smear-the doctor chooses the method depending on which tissues are to be studied.

Then the material is sent to the laboratory and examined using an electron microscope. It is pre-treated with a special substance and sealed with paraffin, cut into thin slices and painted. The specialist gets the opportunity to see the structure of the causal area, to determine the nature of pathological changes. The results are ready in about 7-10 days.

The laboratory team is currently continuing in-depth study of various pathomorphological changes in gynecological diseases, pathomorphology of fetuses and newborns, the study of placental morphology, as well as justification from the point of view of histological changes in the effectiveness of new methods developed by clinicians for the diagnosis, treatment and prediction of pregnancy pathology in women at high risk for possible perinatal losses.

The volume of histological and cytological studies ranges from 20,000 to 30,000 objects per year. The laboratory is equipped with a line of modern automatic devices for the production of histological preparations and the implementation of immunohistochemical (IHC) studies. In the practice of scientific research, morphometric methods were introduced using application programs and a system for documenting histological objects using computer technologies.

The study of biopsy (including postoperative) material includes in vivo sampling of tissues from the human body (during surgery or taking endometrial scraping, cervical biopsy) and their subsequent microscopic examination with the

issuance of a histological conclusion. This study is required to confirm or clarify the clinical diagnosis. The main material under study is nodes of uterine fibroids, ovarian cysts, biopsies, scrapings and aspirates of the endometrium, cervix, placenta, etc.

Histological examination of the nodes of uterine fibroids can predict the course of the disease and optimize the further tactics of observation and treatment of patients.

Methods: The study of surgical material in the framework of clinical testing and scientific works allows us to develop more effective diagnostic methods and deepen knowledge about the etiology and pathogenesis of myomas.

A cyst is a benign formation that is a cavity filled with fluid. This formation is not a tumor and appears due to the accumulation of fluid in the tissue. In 90 % of cases, the cyst is functional, or follicular. The most common are serous and mucinous cystadenomas, endometrioid and follicular cysts, and corpus luteum cysts.

The material taken during the operation is examined in order to:

- To diagnose a tumor, precancerous, hormonal and inflammatory diseases;
- Determine the nature of the pathological process, its prevalence.

An endometrial biopsy is an intravital sampling of the tissue of the uterine mucosa (endometrium) for subsequent histological or histochemical analysis. This procedure refers to small surgical interventions in gynecology and is most often performed as an independent study that allows you to identify various abnormalities.

- endometritis – inflammation of the endometrium;
- the discrepancy between the thickness of the functional layer of the endometrium and the current phase of the ovarian-menstrual cycle.
- simple diffuse hyperplasia of the endometrium;
- complex endometrial hyperplasia, this condition can also be described as adenomatosis;

-local endometrial hyperplasia (with or without atypia), which is regarded as single polyps or polyposis;

-atypical hyperplasia (simple or complex), in which the cells of the overgrown mucosa do not correspond in their morphofunctional characteristics to normal endometrial cells;

-malignant degeneration of tissue;

-atrophy or hypoplasia of the uterine mucosa;

Detection of atypia is of great prognostic value. Some forms of atypical hyperplasia are referred to as precancerous.

Scraping and aspirate from the cervical canal and the uterine cavity is done in order to:

-identify the cause of infertility;

-determine the hormonal background;

-in uterine bleeding of unclear etiology;

-if endometrial hyperplasia or endometriosis is suspected, as well as malignant processes (in the case of these diseases, the uterine cavity aspirate is prescribed again);

-as a therapeutic procedure (for cervical canal polyps, endometrial polyps);

-in the case of atypical vaginal discharge;

-additionally, aspirates from the uterine cavity are taken in cases where a woman uses hormonal agents and an intrauterine device as a means of contraception for a fairly long period. It is known that the use of a spiral longer than the prescribed period can lead to thinning of the uterine endometrium and, as a result, to the development of inflammation of the reproductive organs.

The placenta is a unique organ that is formed only during pregnancy and connects the mother's body and the fetus ' body, providing it with all the necessary nutrients. The placenta-fetus system works smoothly, but sometimes there are failures in the placenta under the influence of external or internal factors. As a result, violations occur that can provoke serious consequences.

The placenta after childbirth and miscarriages is examined in order to:

- determine the presence or absence of an infectious and inflammatory process;
- establish the compliance of the placenta with the gestational age;
- evaluate the severity of microvascular disorders;
- identify the nature and degree of compensation for placental insufficiency;
- to clarify the causes of miscarriage, premature birth, disorders in the development of the embryo.

Cytological examination of the cervical and cervical canal smear:

According to statistics, cervical cancer is in third place in a number of oncological diseases in women. To detect it at an early stage, a smear is taken for oncocytology. With its help, the nature of the pathological process is determined, and precancerous, dysplastic lesions, reactive, inflammatory changes, as well as benign tumors are detected. It is necessary to conduct periodic (every six months) smear tests for oncocytology.

Direct indications for smear examination for oncocytology:

- when diagnosed with infertility;
- when planning a pregnancy;
- in the case of a violation of the menstrual cycle, for example, an atrophic type of smear will indicate hormonal changes in the body against the background of the onset of menopause;
- if oral contraception is used;
- in preparation for setting up the IUD;
- with erosion or any other pathologies of the cervix;
- in case of obesity;
- in case of detection of human papillomavirus, genital herpes in the body;
- in the presence of cancer in the family;

A smear for cytology is not taken:

- during menstruation, because red blood cells may be mistakenly detected in the cytology smear;

- in acute inflammatory process in the genital area;
- with abundant discharge from the vagina, pronounced itching.

The material is collected in the women's clinic of the Federal State Budgetary Institution "NII OMM", during the examination by a gynecologist. The doctor takes 2 smears: from the outer part of the cervix and from the cervical canal (cervical canal). This procedure is painless, not traumatic. To take a smear, use a gynecological mirror and a cytochrome or spatula.

To obtain reliable results, it is advisable to prepare for the procedure of taking a smear in advance:

- refrain from intimate relationships for 24-48 hours before visiting a gynecologist;
- exclude the use of vaginal products - lubricants, sprays, candles, etc.;
- Do not urinate before taking a smear for at least 2 hours.

Immunohistochemistry is one of the modern methods of differential diagnosis of oncological diseases, pathological processes in the human body, and assessment of the biological potential of cells (growth rate, prognosis of the course of the tumor process, response to chemotherapy and hormonal treatment). It allows us to determine the histogenesis of a tumor at the cellular level and is based on the identification of specific antigenic properties of cells in the studied tissues.

The IHC technique also allows you to determine the presence or absence of steroid hormone receptors, as well as the percentage of hormone-positive cells in the tissues and tumor formations of the female reproductive system.

In addition to determining the receptors for estrogen and progesterone, the study of such antigens as: CD20, CD138, CD3, Ki67, human papillomavirus, HSV-1, cytomegalovirus. It is also possible to determine: CD56, CD79a, CD62L, p53, bcl-2, p16, M-CSF, Angiogenin, Annexin V, PIGF, IGF 1, TNF-alpha, HIF 1, LIF, LIFR, VEGF-R1, VEGF-R3, Estradiol-alpha, Estradiol-beta.

Progesterone and estrogen receptors belong to the intracellular receptors of steroid hormones, are present in various target tissues, including the mammary glands and uterus, where they are involved in the mechanisms of hormonal

induction of the synthesis of matrix RNA, proteins, the release of cytokines and growth factors.

Results: Estrogens and progesterone are involved in the mechanisms of infertility and such pathological processes as endometrial polyps and hyperplasia, endometriosis. The study of their expression is included in the standard examination of gynecological patients, as it allows you to determine the hormonal sensitivity of the tissue, to clarify the prognosis of the disease and the potential effect of hormonal treatment.

CD20, CD138, CD3-analysis of these markers is aimed at identifying cellular and immunological imbalances in the endometrium for a more accurate diagnosis of the stage of chronic endometritis and the prevalence of the process. Indications: infertility, chronic endometritis, inflammatory processes of the uterine mucosa.

Ki67-is the "Gold Standard" in the evaluation of cell proliferative activity, which is found in growing, dividing cells, but is absent in the resting phase of cell growth. This characteristic of Ki67 makes it possible to predict the prognosis of the growth of myoma nodes and endometrial hyperplasia.

Antibodies to the human papillomavirus (Papillomovirus) - currently, it is proved that the main etiological factor in the development of cervical cancer is the human papillomavirus (HPV). A single detection of HPV infection in the epithelium of the cervix is not informative enough, since its course depends on the state of the immune system, one of the most unfavorable trends is the persistence of the virus. The pathological process is asymptomatic, so the best way to detect it is to conduct an immunohistochemical study.

Antibodies to herpes simplex virus type 1 (HSV 1), cytomegalovirus (CMV) - HSV and CMV can affect the fetus during pregnancy and complicate its course. Herpes in the first trimester can cause severe congenital abnormalities and spontaneous termination of pregnancy.

Autopsy examination is a post-mortem histological examination to determine the cause of death, the features of the course of the disease.

Stomach polyp is a rare disease that cannot be determined without a biopsy based on the symptoms. There are some clinical symptoms that do not appear often: bleeding, vomiting, abdominal pain. In most cases, the formations are found during the examination for other diseases. The cause of the appearance of polyps can be disorders in the mucous membrane or inflammatory processes.

Also, in an asymptomatic form, a polyp of the cervix occurs. Very rarely, the growth of polyps in this area becomes an impetus for the occurrence of bleeding, irregular menstruation, severe pain, and abundant white discharge.

An endometrial biopsy is performed to diagnose the condition of the mucous membrane. With this procedure, thickening and growth of the uterine mucosa, as well as carcinomas, can be detected. The endometrium is examined both by the usual method and by a pipel – a small plastic tube with an average diameter of 3 mm. Some reproductive doctors prescribe a pipel biopsy as a special examination to rule out miscarriage.

Histological examinations can be part of pregnancy monitoring. Chorions are cells that contain the same genetic material as the fetus. Chorionic biopsies can reveal diseases such as Edwards, Patau, Down syndrome, and many other gene diseases that are accompanied by mental retardation or deformities. It is carried out for up to 12 weeks. The study of placental cells is prescribed in the second trimester. Amniocentesis is performed much later at the time of 16-24 weeks. The diagnostic capabilities of this type of analysis are much higher than the previous two, but at the same time, the longer the period, the more dangerous it will be to terminate the pregnancy. Puncture of the umbilical cord of the fetus is aimed at identifying chromosomal and genetic diseases. It is carried out at a period of 22-25 weeks.

The study of the inner layers of the cervical tissue and the uterus itself, called the endometrium, allows you to monitor the work of the ovaries, diagnose any pathologies and diseases at the initial stages, and identify endometrial hyperplasia.

Conclusion: To collect materials for laboratory testing, scraping is performed from the inner walls of the uterus. With incessant bleeding, do not wait for the time of the planned monthly period, tissue sampling is carried out immediately.

On the colored sections, you can determine the features of the endometrium and its structure. Healthy unaltered glands differ from patients in shape, they have a sawtooth, light colored cytoplasm. And there must be a secret inside them.

Histology of tissues taken from the cervix is performed if there are concerns about the occurrence of precancerous, precancerous conditions or the presence of inflammation in this organ. For analysis, a small particle of material is taken from the surface of the neck, the sampling is performed without opening it.

The collection of material for the examination is carried out simultaneously during the hysteroscopy for diagnostic purposes. This intervention is an examination of the internal tissues and the surface of the uterus using an optical device specially designed for such a procedure, called a hysteroscope.

The doctor selects a piece of tissue under anesthesia (usually general, but sometimes only anesthesia is used). The selected tissues are sent for histological examination, which will help determine the cause of disorders in the work of the reproductive organ and distinguish a malignant tumor from a benign one (for example, fibroids).

Curettage of the uterus and its cavity is a complex process of collecting endometrium, so it is performed in the operating room under anesthesia or anesthesia. The procedure takes about half an hour.

When scraping, the material is collected with a curette. All the resulting biological material is collected in a test tube and sent to the laboratory. Indications for this procedure are problems with pregnancy (miscarriage, infertility), endometrial hyperplasia. Also, the material can be collected when removing the placenta left after childbirth.

After scraping, tissue samples obtained directly from the uterus itself are examined. To do this, a part of the epithelium is removed and the biological material is taken after its removal from the uterus.

A histology test performed after a miscarriage or other pregnancy problems will show the causes of these problems.

Prescribe a histological analysis is necessary in cases where it is necessary to confirm or deny the presence of cancer cells in the body. The study will show their presence even in the earliest stages of the disease, which are asymptomatic. This will help you start treatment in a timely manner and fully recover.

IHC is a method of microscopic examination of tissues that provides the most specific detection of the desired substances in them and is based on the "antigen-antibody" interaction. Immunohistochemical methods are used to detect the localization of a particular cell or tissue component (antigen) in situ by binding it to labeled antibodies and are an integral part of modern cancer diagnostics, providing detection of localization in the tissues of various cells, hormones and their receptors, enzymes, immunoglobulins, cell components and individual genes.

Immunohistochemical studies allow:

- perform histogenetic diagnosis of tumors
- determine the nosological variant of the neoplasm;
- to identify the primary tumor metastasis with an unknown primary lesion;
- determine the prognosis of a tumor disease;
- determine the malignant transformation of cells;
- identify opportunities for targeted therapy;
- detect both resistance and sensitivity of tumor cells to chemotherapeutic drugs;
- determine the sensitivity of tumor cells to radiation therapy.

Often (in 2 out of 3 cases, the desired pregnancy does not occur), these pathologies are the main causes, so it is so important to contact an experienced specialist in time and conduct IHC.

With the help of immunohistochemical examination of the endometrium, it is possible to detect infection with viruses (HPV 16, HSV, etc.), which has recently received much attention as the cause of chronic endometritis and, as a result, infertility of a woman.

The correct method of removing the material for analysis and its volume affect the correct result. Therefore, it is very important for the doctor to choose the appropriate method for collecting samples in each particular case. Histology is a complex study, it is necessarily carried out by a pathologist, who is a specialist in the field of studying the tissues of the human body.

A very important and most informative type of study in gynecology is considered to be a histology analysis. Women's health in general depends on the functioning of the genitals, so the prevention of various diseases or their treatment at an early stage can significantly improve the standard of living of the patient.

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Ovarian histology is performed by inserting a puncture needle through the abdominal wall. It penetrates into the ovaries themselves and selects material for analysis directly from questionable areas (cystic or tumor-like). The process of collecting tissues is carried out under the control of the ultrasound machine, this allows you to collect tissues from areas that cause suspicion.

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