Introduction to obstetrics. Modern methods of examination in obstetrics. Prenatal diagnosis

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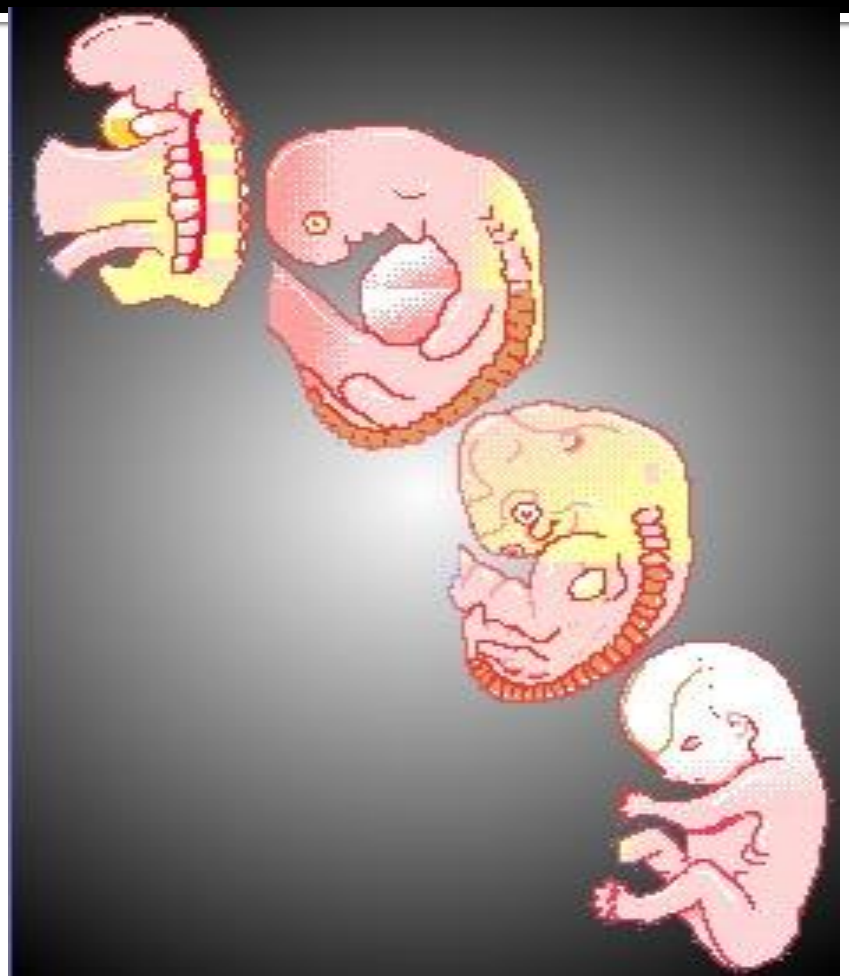


Obstetrics-

- (French “accoucher” -birth assistant) - the field of clinical medicine dealing with physiological and pathological processes in the body of a woman related to conception, pregnancy, labor and the postpartum period. Obstetrics develop care, prevention and treatment of pregnancy and labor complications , diseases of the fetus and newborn.

Perinatal help -

- It is a system of medical care for women, the fetus and newborn, including pregravidal period, labor (delivery) and postnatal period

The organization of perinatal care in the Republic of Belarus

Levels of perinatal care:

First - the district.

Second - interdistrict.

Third - the regional.

Fourth - Republican (Republic Science and Practical Centre "Mother and Child").

The structure and organization of work in the maternity hospital

The basic divisions of obstetric hospital:
the admission department,
maternity ward (delivery department),
operating unit,
postpartum department,
second obstetric (observational) department,
department of pathology of pregnancy,
department of newborns,
intensive care unit,
gynecology department,
Laboratory,
physiotherapy room,
administrative part.

Indications for hospitalization and transfer to second obstetric (observational) department :

- Respiratory diseases, flu, pneumonia, fungal and other skin diseases, acute thrombophlebitis, infectious and parasitic diseases (HIV, syphilis, tuberculosis, toxoplasmosis, CMV-infection, viral hepatitis, head lice, diarrhea, etc.)
- inflammatory diseases of the urinary system (pyelonephritis, etc.) and the genital tract,
- elevated body temperature (37,6 ° C and above) in the absence of clinical signs of infection, fever during labor up to 38 ° C and above, with 3-fold measurements every hour, a long waterless period (12 hours or more)
- antenatal or intranatal fetal death, diagnosed congenital abnormalities of the fetus at term after 22 weeks.,
- delivery outside the hospital (home labor), absence of medical records, absence of antenatal survey,
- purulent-septic diseases in the postpartum period, gapping on the anterior abdominal wall or perineum,
- neonatal inflammatory disease of the skin, signs of intrauterine infection.

Sanitary and epidemiology in maternity hospitals.

- **In admission all incoming women are separated to physiological and observational departments.**
- **In the maternity ward alternately work 2 delivery rooms and 2 prenatal chambers, which allows for its disinfection. Each delivery room works no more than 3 days.**
- **During labor vaginal investigation is conducted strictly on the indications (no more than 5 times).**
- **All departments have mobile and stationary bactericidal irradiators.**
- **In the postpartum departments all rooms are filled cyclically, ie in one room there are mothers with their children, who was born in one day. After their discharge rooms undergo cleaning and disinfection.**
- **In the postnatal department there are current cleaning, airing and UV exposure thrice a day.**

Sanitary and epidemiology in maternity hospitals.

- The use of disposable bags for every labor.
- According to indications woman is hospitalized or transferred in the second obstetric department.
- If the husband or relative are presenting during delivery, they must be interviewed on the behavior during delivery, they must have a certificate from the clinic of absence of infectious diseases and the of contact with sick people.
- Center of hygiene and epidemiology controls sanitary and epidemiology in the hospital . For each case of septic complications at CGE emergency notification is sent .
- Each maternity hospital is closed for routine preventive disinfection every 6 months. In outbreaks of septic diseases hospital is closed for emergency anti-epidemic cleaning.

Women consultation (Prenatal Counseling) -

- this is outpatient clinics such dispensary, providing medical and preventive care for women.

Main areas of work the female consultation:

- check-ups for pregnant women and gynecologic patients,
- prevention of complications of pregnancy and labor,
- prenatal care of fetus,
- family planning (contraception, abortion)
- treatment of gynecological diseases
- health education.

Specialized medical care -

- "Kind of medical care provided by medical specialists in specially designed for this purpose medical institutions or departments using modern medical diagnostic tools and equipment."

Specialized obstetric and gynecological care.

- extragenital pathology,
- miscarriage,
- congenital and hereditary pathology,
- infertility,
- gynecological endocrine pathology,
- pediatric and adolescent gynecology,
- cervical pathology,
- family planning,
- cancers in obstetrics and gynecology,
- endoscopic surgery.

Center for Medical Genetics

- age 35 and older,
- chromosomal disorders or abnormalities in one of the spouses or relatives,
- the birth of children with hereditary diseases,
- incestuous marriages,
- habitual miscarriage,
- complications in the current pregnancy (miscarriage, polyhydramnios, etc.)
- fetal abnormalities, diagnosed by ultrasound,
- abnormal biochemical screening (alpha-fetoprotein, hCG, etc.)
- occupational hazard in parents,
- primary amenorrhoea or menstrual disorders of unknown origin.

Reserve group for labor:

The group of "active" surveillance

- undergoing pregravid preparation,
- married this year,
- registered for infertility.

The group of "passive" surveillance

- using contraception to prevent unwanted pregnancy,
- treating chronic diseases.

All women from the group of "active" surveillance for 6 months before planned pregnancy make prevention of congenital pathology of the fetus:

Folic acid is 400 ng 1 time per day orally,

Potassium iodide, 100 mg daily orally.

The reserve group does not include women with severe somatic diseases, which are contraindications for pregnancy, with two or more children, those who do not want to give birth, women after surgical sterilization or loss of fertility (2-sided salpingectomy, hysterectomy, etc.).

Symptoms in the first trimester (0-12 weeks):

- *Amenorrhoea*
- *Morning sickness*
- *Breast symptoms*
- *Appetite changes and sleepiness.*
- *Weight gain*
- *Skin*
- *Urinary symptoms*
- *Abdominal enlargement*
- *Uterine signs*
- *Vagina*

- F*etal movements*
- *Fetal signs*

Examination of pregnant women includes:

1. Examination and complains.
2. Medical history:
Passport data.
Life history (heredity, past illnesses, conditions of work and life.)
Reproductive history (menstrual function, sexuality, reproductive function, gynecological diseases, genital function).
Peculiarities of present pregnancy by trimesters.
3. The general objective examination.
4. Special obstetrical examination:
external (inspection, measurement, palpation, auscultation);
internal (examination of the external genital s, per speculum, vaginal examination);
5. Additional methods.

Initial Prenatal Evaluation

- Prenatal care should be initiated as soon as there is a reasonable likelihood of pregnancy. The major goals are to:
- Estimate the gestational age.
- Define the health status of the mother and fetus.
- Initiate a plan for continuing obstetrical care.
- *Typical components of the initial visit :*
- history (menstrual, sexual, childbirth and secretory functions)
- physical examination
- blood pressure (both hands) and pulse
- maternal weight
- body temperature
- special external obstetrical examination(mammary glands, fundal height, pelvic examination, sacral rhombus (Mikhaelis), radiocarpal index (Solovjev), abdominal circumference; fetal lie, presentation, position and type of position
- HIV counceling

- *Special examination:*
- per speculum
- per vaginum
- Pap smear screening
- bacterioscopy from the cervical channel, fornix and urethra

- *Additional examination*
- bacteriology from the cervical channel, fornix and urethra and detection for antibiotics sensivity
- sexually transmitted diseases screening – HPV, HSV, CMV and others
- rectovaginal examination

Laboratory tests

- Blood type and Rh factor
- Full blood count
- HIV screening
- Syphilis serology
- Glucose blood test
- Blood biochemistry (bilirubin, protein, kreatinin, ALT,AST)
- Urine analysis
- Coagulogram

- *Additional laboratory tests*
- antibody screen
- anty-phospholypid syndrome screening
- glucose – tolerance test
- urine Zimnitski and Nechiporenko analysis etc.
- *Instrumental examination:*
- ECG
- Ultrasound of the uterus and fetus
- Cardiotocogram
- Ultrasound of the internal organs
- Chorion biopsy
- Amniocentesis
- *Additional instrumental examination:*
- amnioscopy
- dopplerometry of blod vessels in the uterus and in fetus
- colposcopy
- *Specialists examination*:
- therapeutist (general practitioner)
- ophthalmologist
- endocrinologist
- dentist
- otolaryngologist

PHYSIOLOGICAL CHANGES DURING PREGNANCY

- **Cardiovascular Changes**
  - Increase of blood volume
  - Disproportion between the volume of circulating plasma and red blood cells leads to physiological anemia,
  - Reduction of blood viscosity,
  - Increase of cardiac output,
  - Increase of heart rate,
  - Increase of venous pressure,
  - Reduction of the total peripheral vascular resistance,
  - Topographic and anatomical changes with the displacement of the heart's axis.

- **Pulmonary Changes:**

Vital Capacity- increased by 100-200 mL
Inspiratory Capacity- increased by 300 mL
Expiratory Reserve Volume- decreases
Residual Volume- Decreases
Functional Residual Capacity- reduced
Tidal Volume- increases from 500 to 700 mL
Minute Ventilation- increases up to 40%

- Anatomic and physiologic changes occurring during pregnancy have the potential to affect the musculoskeletal system at rest and during exercise
- Weight gain (typically 12 kg, but nor more than 300g/week)
- Shift in center of gravity (shifted forward, posture of increased lumbar lordosis, back pain)
- Increased ligamentous laxity (related to the effects of estrogen and relaxin)

Additional methods of obstetrics examination include:

I. Instrumental:

1. Ultrasound.
2. Cardiotocography.
3. Fetal biophysical profile.
4. Amnioscopy.

II. Laboratory :

1. Analysis of amniotic fluid.
2. Vaginal cytology.
3. Study of fetal and newborn.
4. Histology.
5. Biochemical and hormonal analysis.
6. Diagnosis of intrauterine infection.

Objectives of the antenatal diagnosis

- investigation of the growth and development of the fetus
- evaluation of indicators of his life
- antenatal care in pregnancy
- reduction of perinatal morbidity and mortality.

Ultrasound examination

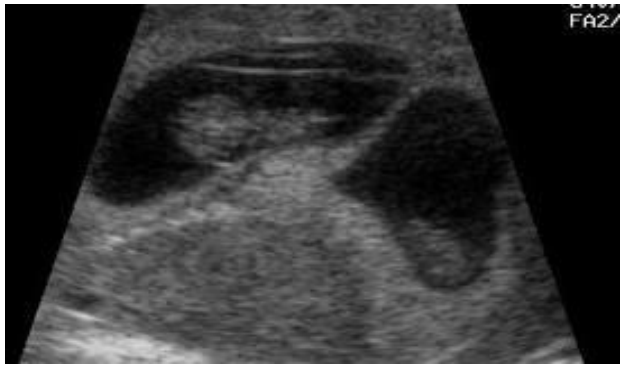
- The method is based on the echolocation principle
- Special sensor transmits ultrasonic vibrations that are reflected from the target organ, accepted by the same sensor
- With the help of computer processing on the display creates an image a certain section of the studied organ
- Ultrasonic sensor emits only 0.1% of the time, all the rest of the time he is in receive mode

Ultrasound examination

- One of the modern, highly informative and widely available diagnostic methods in obstetrics and gynecology
- Despite the fact that the negative effect of ultrasound on the fetus has not been proved, this study should be carried out only on indications

USG can identifies:

- presence of the gestational sac in the uterus or outside of it
- determine its size and number
- pregnancy
- livelihoods of the embryo, fetus
- condition of the placenta (the location, thickness, structure)
- amount of amniotic fluid

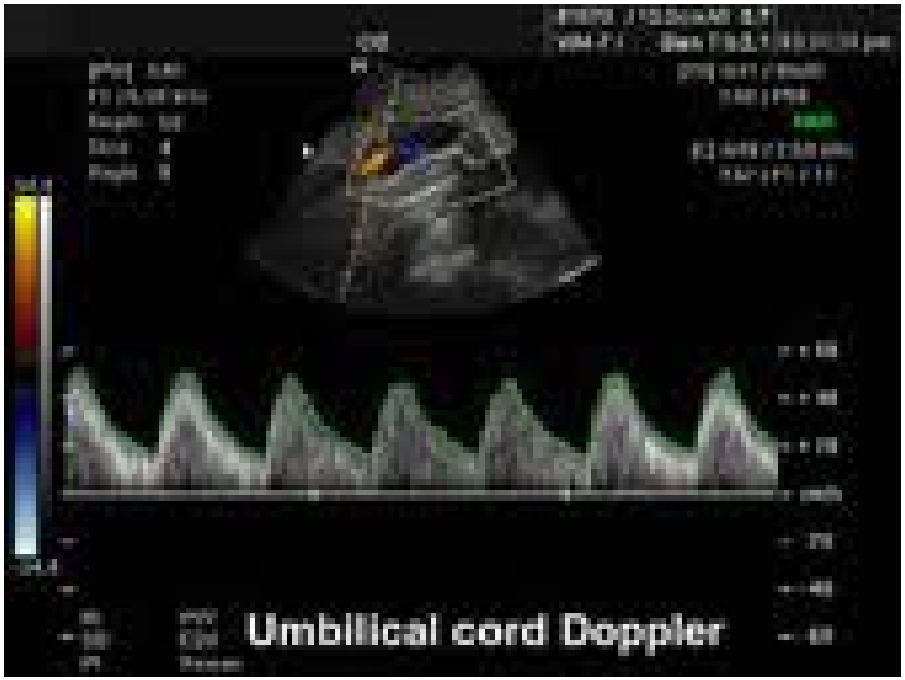


- congenital abnormalities
- location, type and fetal presentation, position the umbilical cord
- accompanied to the pregnancy tumors of the uterus (uterine myoma) and ovaries, malformations of the uterus (rudimentary and bicornuate uterus, septum of the uterus)
- uterine scar after a previous cesarean section
- the true conjugate and the transverse size of the cavity of the pelvis

Blood flow is determined in:

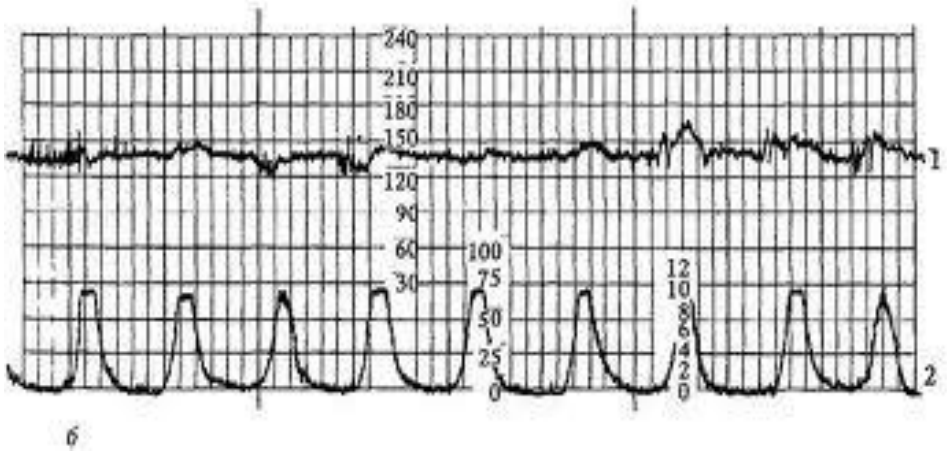
•umbilical arteries;

•aorta, carotid, renal, middle cerebral arteries of the fetus;
•uterine artery, etc.



CTG is carried out on the following parameters:

- Baseline fetal heart rate (FHR);
- Baseline FHR variability (amplitude and frequency of oscillations);
- Presence of accelerations;
- Periodic or episodic decelerations.



Normal antenatal CTG is characterized by the following criteria:

- baseline FHR is 120-160 beats per minute;
- amplitude variability of FHR is 5-25 beats per minute;
- decelerations are absent or observed sporadic, shallow and very short;
- recorded two or more accelerations for 10 minutes.

Contraction stress tests include:

1. oxytocin challenge test (OCT);
2. short delay breath inhalation or exhalation;
3. thermal stimulation of the abdominal skin;
4. exercise of the mother;
5. nipple stimulation;
6. acoustic stimulation.

Biophysical profile of the fetus.

- non-stress test (NST);
- fetal movement;
- fetal tone;
- fetal breathing movements;
- amniotic fluid volume;
- fetal heart rate;

Amnioscopy - visual method of amniotic fluid investigation by examining the lowest part of the amnionic sac with amnioscope

- color;
- transparency;
- consistency;
- admixture of blood or meconium in the amniotic fluid.

INDICATIONS

- chronic hypoxia.
- prolonged pregnancy.

CONTRAINDICATIONS

- vaginitis.
- cervicitis.
- placenta previa.
- breech presentation of the fetus.

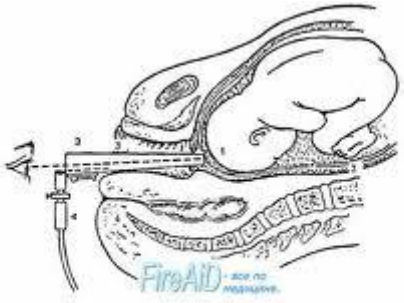


Рис. 1. Амниоскопия
1 – шейка матки; 2 – плодный пузырь; 3 – тубус амниоскопа; 4 – освещение.

Amniocentesis - ultrasound-guided transabdominal, transvaginal, transcervical puncture of amniotic cavity and sampling of amniotic fluid for biochemical, hormonal, cytological, immunological, genetic investigations. Produced since the 16th week of pregnancy.

INDICATIONS

Prenatal diagnosis of congenital and hereditary diseases.

Laboratory diagnosis of congenital and hereditary diseases is based on cytogenetic and molecular analysis of amniocytes.

Amnioreduction (with polyhydramnios).

Administration of drugs into amniotic cavity to induce abortion in the II trimester.

Assessment of the fetus in the II and III trimester of pregnancy: the severity of hemolytic disease of the fetus , the maturity of lung surfactant, the diagnosis of intrauterine infections.

Fetal therapy.

Fetal surgery.

CONTRAINDICATIONS

Acute process or exacerbation of chronic inflammation of any location.

Vaginal cytology

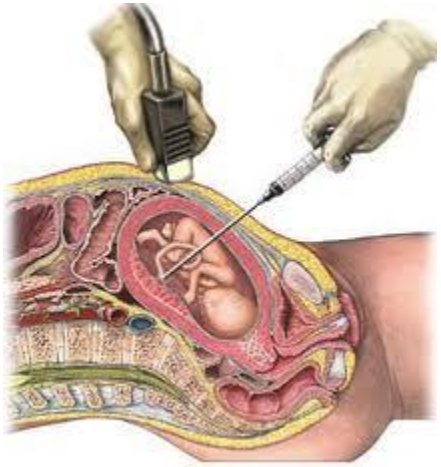
- - cytology smears from anterolateral vaginal vault for the indirect assessment of the estrogen level in pregnant women.

In smear four types of cells are defined :

- superficial;
- scaphoid;
- intermediate;
- parabasal.

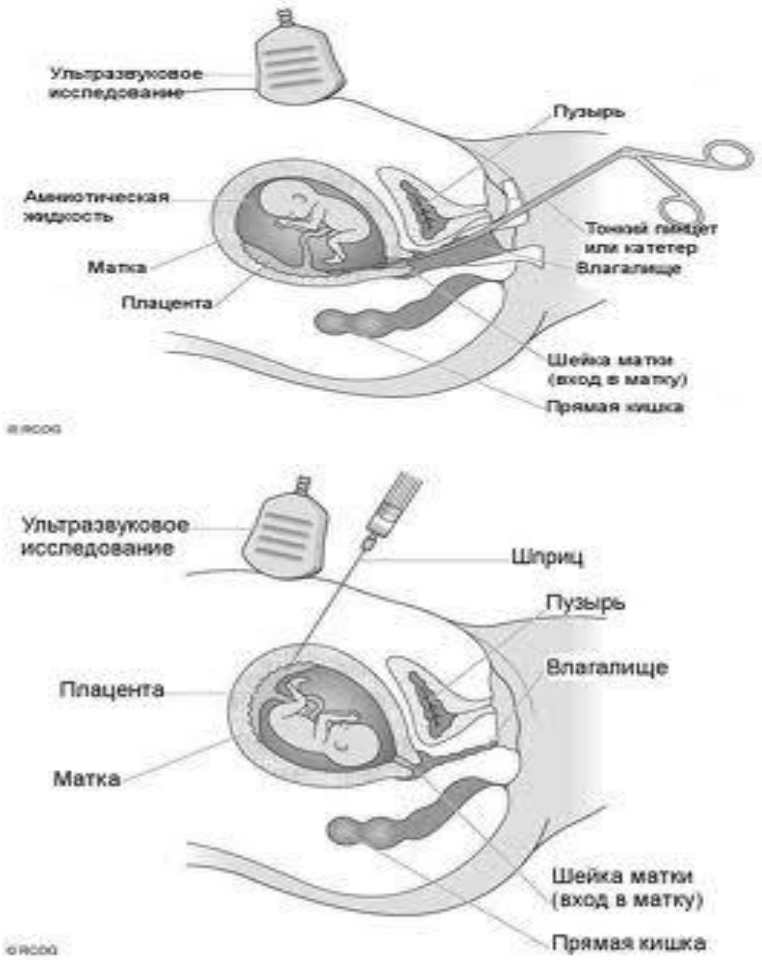
Blood test of the fetus and newborn.

- ***Cordocentesis -*** a ultrasound-guided method of blood sampling from the umbilical cord for diagnostic and therapeutic purposes.
- Determination of the ***acid-base state*** of the blood of the fetus during labor performed after rupture of fetal membranes. Capillary blood obtained from the presenting part of the fetus by scarification of the skin.



Histology.
Chorionic villus sampling

- sampling of the chorionic villus to test it for fetal karyotype, to identify chromosomal and genetic abnormalities, to determine the sex of the fetus at 10-12 weeks of pregnancy.



Chorionic villus sampling

INDICATIONS

The age of the pregnant 35 years and older.

Down syndrome child or identification in previous pregnancies the fetus with Down syndrome or other chromosomal diseases.

Previous child with multiple congenital defects.

Karyotype anomalies in the parents.

The presence of biochemical and/or ultrasound markers of chromosomal disease or congenital abnormalities of the fetus.

Determine the sex of the fetus in sex-linked diseases.

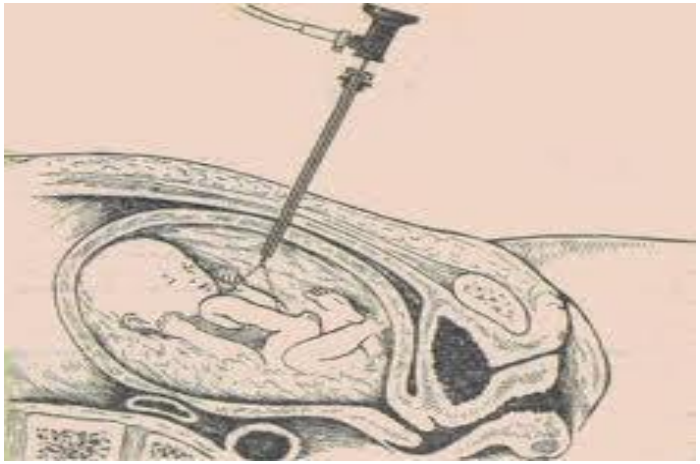
RELATIVE CONTRAINDICATIONS

Acute inflammation or worsening of a chronic inflammatory process of any location.

The presence of clinical and/or ultrasound signs of threatening abortion

Fetoscopy

- - method of direct examination of the fetus, a biopsy of the epidermis by the insertion a special endoscope into the uterus for diagnosis of congenital anomalies and congenital diseases of the fetus.



Biochemical and hormonal investigations.

- human chorionic gonadotropin (hCG);
- alpha-fetoprotein (AFP);
- human placental lactogen (HPL);
- progesterone;
- estrogens;
- prolactin (PRL);
- thyroid hormones;
- corticosteroids;
- pregnancy associated proteins (PAP), etc.

Diagnosis of intrauterine infection.

There are 2 groups of methods:

identification of the antigen in the samples – immunofluorescence test, polymerase chain reaction;

identification of antibodies Ig A, M, G - enzyme immunoassay.

The study materials:

cervical columnar epithelium;

serum of the mother and fetus;

urine of the mother;

placenta;

amniotic fluid ..

Take home messages:
-indications for dept. of pathology
- taking the patient's history