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INSTRUCTION AND METHODOLOGICAL MANUAL ON PHYSIOLOGICAL OBSTETRICS

Edited by prof. ***L.I. Trubnikova***

3rd edition

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This manual includes 9 topics for practical training on physiological obstetrics. It is a 3rd edition of the manual, revised and expanded.

This manual defines goals, highlights the key issues which make up the subject matter of practical classes, offers a set of questions which constitute the fund of evaluation tools for students' self-control and assessment of the initial level of knowledge in a practical class, standard answers to them. It also includes a list of practical skills to be mastered by students both in and out of class.

This manual has been compiled by the Department of Obstetrics and Gynecology, Faculty of Medicine, Ulyanovsk State University.

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PREFACE

Obstetrics is a field of medicine that studies the physiological and pathological processes taking place in the woman's body in connection with conception and pregnancy, during childbirth and the postpartum period, and also develops the methods of obstetric aid, prevention and treatment of complications of pregnancy and childbirth, diseases of the fetus and newborn babies. The questions of neonatal care, diagnosis and treatment of neonatal pathology are studied and performed by specialists in neonatology. Mastering practical skills in obstetrics necessarily implies the availability of deep knowledge of fundamental and other medical fields.

The science of obstetrics is based on deep knowledge of the fundamentals in therapy and surgery, and includes special information relating only to obstetrics and neonatology. For the study of obstetrics, there are special medical institutions in which, after basic medical training, the characteristics of physiological, pathological and operative obstetrics are studied, as well as the period of newborn babies.

The present manual is intended to facilitate the practical assimilation of knowledge on obstetrics by students of the 4. 6 years, clinical residents, young doctors.

The second edition got a positive assessment of students, but the development of obstetrics and perinatology in recent years has required some changes and additions.

The manual includes materials in accordance with the latest regulatory documents, a new classification of contracted pelves, supplemented the structure of obstetrical institutions, the performance indicators of the maternity hospital, a new classification of contracted pelves, in the section of pathological obstetrics, new classifications of the pathology of pregnancy and childbirth are given for a prompt delivery.

Topic 1
THE STRUCTURE, ORGANIZATION OF WORK AND ANALYSIS OF ACTIVITY INDICATORS OF A MATERNITY INPATIENT HOSPITAL

Objective of the class: To familiarize the students with the principles of organization of outpatient and inpatient care for pregnant women, parturient women and gynecological patients, the structure of typical maternity hospitals, maternity units, gynecological departments, the tasks of these units, the required documentation, as well as the basic performance indicators of a maternity hospital.

Place: a class room, maternity hospital departments, women's consultation room.

Visual aids: Tables with the plan of a typical maternity hospital, depicting the way of the parturient women to the maternity ward of the physiological and observational departments, as well as accounting and reporting documentation.

Contents of the class:

The organization of work in obstetric hospitals is carried out according to one major principle in accordance with the provisions adopted in the country. Qualified medical assistance is rendered in rural, central regional hospitals, inter-district obstetric departments at large central maternity hospitals, city maternity hospitals; multidisciplinary and specialized medical institutions with maternity wards, obstetric departments of regional hospitals, prenatal centers.

The maternity hospital is an independent medical and prophylactic institution of the municipal district (city district), the maternity ward is a structural subdivision of the medical and prophylactic institution of the municipal district (city district), set up to provide obstetrical and gynecological care for women during pregnancy, childbirth, the postpartum period, care for newborn infants and women with diseases of the reproductive system.

The variety of types of obstetric hospitals provides for their differentiated use. Currently, obstetric hospitals are divided into 3 levels, depending on the degree of pregnancy risk and prenatal pathology.

Women with repeated pregnancies (up to 3 births inclusive) are referred to the maternity department of the central district hospital (I level) who did not

have obstructed obstetric anamnesis and first-pregnancy without obstetric complications and extragenital pathology.

Pregnant women with extragenital diseases, preeclampsia, increased prenatal risk, complications during this or previous pregnancies are referred to the maternity department of the city hospital, the city maternity hospital (II level).

Pregnant women with severe extragenital diseases, severe preeclampsia, presentation and abruption of the placenta, premature and prematurely pregnant are sent to the obstetric departments of the regional or general hospital, a specialized obstetric hospital, a prenatal center (III level).

Obstetric hospital has the following main divisions:

• the reception-admission unit;

• two obstetric departments: physiological and observational;

• the ward (wards) for pregnant women with pathology;

• the department (ward) for newborns in the physiological and observational obstetric departments;

• the department of intensive care and resuscitation of women and newborns;

• the gynecology department.

Admission Department

The admission department is designed for primary examination of pregnant women and parturient women with their subsequent referral to either a physiological or an observational department (with signs of infection). From the admission department the pregnant woman can be sent to a specialized hospital in case of a dead fetus, an obvious focus of purulent-inflammatory infection, an extragenital pathology.

The examination and inspection departments have one filter and two viewing points for taking the parturient women to the physiological obstetric ward and to the observatory obstetric ward.

In the filter room, the general condition of the incoming woman is assessed, the body temperature is measured, the skin is examined using a reflector lamp, the throat with a spatula, the pulse is counted, the temperature, height, blood pressure are measured and she is weighed; she is asked about

previous infectious-inflammatory diseases and contacts with ill people before and during the present pregnancy, and especially before admission to the hospital. After collecting the information for the anamnesis, the question of hospitalization in the physiological or observational department is to be decided.

From the filter room the pregnant woman or the woman in childbirth is transferred to the examination room of the corresponding department.

The examination rooms should have their own rooms for sanitation of admitted women with a shower, a sanitary unit and a room for washing bedpans. When a woman is admitted for childbirth, shaving the skin of the external genitalia and giving a cleansing enema are carried out only at the request of a woman. Before surgery, only the hair near or around the surgical site is removed with gentle methods that do not damage the skin. It is not advisable to use a razor, as this increases the risk of infection. A cleansing enema is administered in case of medical indications. The shower is prescribed to all patients, an individual set of underwear (a shirt, a towel, an underlay diaper, a bathrobe) is given out. It is allowed to use one's clean clothes and shoes.

To render emergency assistance in the examination room there is a medical cabinet with a set of required medications and instruments. Here are: a solution of magnesium sulphate 25%; glucose solution 40%; a solution of dibasol 0.5 and 1%; a solution of euphyllin 2,4%; cordiamine; solution of pentamine 5%; as well as a mouth speculum and a tongue depressor, a portable anesthesia machine in case of admission of pregnant women or parturient women with severe pre-eclampsia or eclampsia.

In the reception room for a pregnant woman or a woman in childbirth, the case history of childbirth is filled in and, accompanied by medical personnel, the woman goes to the maternity ward or department of the pathology of pregnant women, and if there are indications she is transported on a gurney, accompanied by a doctor.

The departments of pregnant women with pathology are provided in maternity hospitals (departments) for 100 obstetric beds and more.

Indications for hospitalization in the department of pathology are:

• pre-eclampsia of pregnant women;

• placenta previa;

• bleeding from the genital tract during pregnancy for more than 22 weeks;

• threatening premature termination of pregnancy;
• polyhydramnios;
• multiple fetuses;
• narrow pelvis;
• transverse or oblique position of the fetus;
• pelvic presentation of the fetus;
• undeveloped pregnancy;
• rhesus-conflict;
• extragenital pathology during pregnancy for more than 22 weeks;
• anemia of pregnant women;
• abnormalities in the development of internal genital organs.

The structure of the department comprises: a ward for pregnant women, an examination room, a manipulation room, a room for medical procedures and ancillary facilities.

Obstetrician-gynecologists, a physician of the maternity hospital work in the department. In this department, a functional diagnostic room is provided, equipped with devices for evaluating the condition of the pregnant woman and the fetus (FCG, ECG, CTG, ultrasound scanning device, etc.). The department is equipped with a small operating room, where cordo-and amniocentesis is performed, suturing the cervix and other small operations.

The physiological obstetrics department includes a sanitary unit, which is part of the admission department, the birth ward, the post-partum ward, the department for newborn infants, the discharge room.

The delivery department consists of delivery wards (delivery rooms, maternity wards), wards of intensive care and monitoring, an operating unit that includes a large operating room, preoperative, anesthesia, small operating rooms, storage facilities for donated blood, plasma, portable equipment, etc.

The staff works in compliance with a strict mode of wearing masks in the delivery unit. Disposable masks. They are changed every 4 hours.

The main wards of the delivery department (delivery rooms, small operating rooms) must be duplicated, so that the work in them alternates with thorough sanitation. Currently, the delivery wards (maternity rooms) are individual ones, equipped in such a way that each woman gives birth in a separate ward, staying in it during all three periods of childbirth. Delivery wards should be equipped with special functional transforming beds for delivery,

cardiotocographs, devices for oxygen supply, nitrous oxide and are equipped with anesthesia equipment to give an anesthetic during a delivery, a table for drying a newborn baby.

Each woman in a delivery ward is given a set of sterile underwear, which includes a shirt, a scarf, a diaper. Beds are covered with sterile bed linen only after the admission of the pregnant woman.Wet cleaning with the use of detergents is done at least 2 times a day in the prenatal ward. Ventilation is carried out at least 3 times a day. After the transfer of the mother to the postpartum department in the vacant delivery ward general cleaning is carried out with disinfectants.

In the delivery ward, the woman in childbirth spends all three birth periods. Here the midwife on-duty performs all procedures administered by the doctor: intramuscular injections and intravenous infusions, the fetal heart rate is listened, the heart rate is measured, the heart rate is listened and calculated, the nature of the labor is monitored (frequency, duration, intervals, intensity of labor), dynamics of the mouth of the womb , anesthesia of childbirth.

To deliver a baby, one must use a sterile obstetric kit, preferably of single use. The midwife lays 2 unfolded diapers on the disinfected tray for a newborn infant, a disposable catheter for the mother and one sterile kit for the initial treatment of a newborn baby. The midwife in the apron made of the waterproof material washes her hands before delivery as for a surgical operation, puts on a sterile gown, a sterile mask and gloves, and performs delivery.After birth, the first examination of the newborn is preferably carried out on the mother’s chest, in order to exclude severe pathology and control the adaptation of the child. Sanitation of the upper respiratory tract of a newborn baby is carried out only if there are indications, all the newborns are not recommended to probe the stomach. If the newborn's condition is satisfactory, after drying the skin, it should be placed on the mother's abdomen (epigastric region) and covered with a warm diaper. It is very important to ensure complete bonding between the mother and the baby immediately after birth. In order for the first feeding to be successful, it is necessary after delivery to allow "skin-to-skin” contact between the baby and the mother "; help the baby to find the breast, properly putting him, if the mother is under the influence of sedatives or very tired.

Separating the child from the mother should be done only when it is absolutely necessary. The necessary procedures (weighing, secondary treatment

of the umbilical cord, the swaddling of the baby) are recommended after the first breastfeeding, after he receives the first drops of colostrum.

After the delivery, the mothers, if necessary, are provided with surgical care. For this purpose, sterile sets of instruments for examining and suturing the cervix, for suturing the perineum, for producing episiotomy or perineotomy, for instrumental examination of the uterus, as well as obstetric forceps and vacuum extractor cups are located in a separate cabinet.

In the delivery room, the woman stays under the supervision of medical personnel in connection with the danger of early postpartum bleeding, and then she and her child are transferred to the postpartum department for joint staying.

The intensive care and treatment ward is designed for pregnant and parturient women with obstetric complications (preeclampsia, eclampsia) or extragenital diseases (cardiovascular diseases, hypertension, etc.). In the ward for 1-2 beds with an area of at least 26 m^2 with a tambour to isolate patients from noise, there should be a centralized supply of oxygen, nitrous oxide, anesthesia equipment, and necessary medications.

The operating unit consists of a large operating room (at least 36 m^2) with a preoperative (at least 22 m^2) and anesthetic, two small operating rooms and ancillary rooms. In the large operating room of the delivery department, the cesarean section and other abdominal sections are mainly performed. In the small operating room of the delivery unit (2 rooms with a floor area of at least 24 m^2), obstetric operations are performed that are not related to abdominal sections (operation of applying obstetrical forceps, vacuum extraction, extraction of the fetus behind the pelvic end, inspection of the birth canal, suturing soft tissues of the parturient canal).

The postpartum department consists of the rooms for women in birth, rooms for expressing and collecting breast milk, a procedure room, a linen room, a hygiene room, a dining room and a day room for mothers. In the physiological postpartum department, 45% of all obstetric beds of the maternity hospital are deployed. In the postpartum department, the cyclic character should be observed when filling wards, i.e. filling the wards with "one extra day" so that women can be discharged and the ward can be sanitized at the same time on the 3-4th day.

Each woman is provided with an individual labeled bedpan. The bed is covered with bedding just before the patient is taken from the delivery room,

and not in advance. Bed linen is changed 4 times a day, on subsequent days - 2 times a day. The shirt and the towel is changed daily.

In the postpartum departments, wards for joint staying of the mothers and newborn babies should be provided. It is desirable that the number of beds in the wards of joint residence was not more than 2 maternal and 2 children. Single room (1 maternity and 1 child's bunk) wards of joint stay are optimal ones.

The joint presence of the mother and child in the delivery room and the postpartum ward is one of the most important measures for the prevention of nosocomial infections.

Unreasonable transportation of newborn babies to various rooms of the obstetric hospital should be excluded. Vaccination, blood collection for neonatal screening, audiological screening, the examination by the doctor are conducted in the ward where the child is.

Before breast feeding, each woman is given a kerchief and a diaper to be placed under the newborn baby during feeding. To express the milk a sterile can covered with a sterile napkin is given. Milk after expressing is collected by nurses.

Every day, at least three times a day, wet cleaning of postnatal wards, corridors and all subsidiary premises is carried out. Once per day, cleaning is carried out with the use of disinfectants.

Dirty linen is collected in a special tank with a tightly closed lid with a cotton or oilcloth bag embedded in it. Clean linen is stored in a special closet for clean linen.

The time of the stay of a woman in an obstetric hospital after physiological birth should not exceed 5 days. During this time, the woman is constantly monitored by the doctor of the department: body temperature is measured 2 times a day, pulse, blood pressure - 2 times a day, examination and palpation of the mammary glands is performed, palpation is determined the fundal height, sutures in the perineum. The doctor performs daily rounds, making appropriate indications.

In the department, if necessary, the mothers are examined, the therapy of extragenital diseases, complications of pregnancy is given. The sutures of the external genitalia are treated. Rh-negative patients (in the absence of Rhesus antibodies in the blood) at the birth of the Rh-positive child must be administered antirezus immunoglobulin within 48 hours without fail.

When the first signs of diseases appear in the mothers or newborns, they are transferred to the second obstetric (observational) department or to a specialized hospital.

At the discharge of the mother, the treating doctor gives explanations about the benefits and recommended duration of breastfeeding (from 6 months to 2 years after the birth of the child) and the prevention of unwanted pregnancy. Before discharge, ultrasound of the pelvic organs is performed. After discharge from the maternity hospital, the mother gets a referral to the women's consultation at the place of residence for dispensary follow-up during the postpartum period.

Observation Obstetric Department is like an independent maternity hospital with a corresponding set of facilities.

Indications for hospitalization in the observation ward are:

• the mother in childbirth and the pregnant woman’s contact with infectious patients;

• a rise in temperature above 37.5 °C, with unexplained diagnoses without signs of any infection;

• skin diseases;

• dead fetus;

• late miscarriage which started without signs of infection;

• women after a delivery at home and in the open air;

• ARVI;

• diarrhea;

• a long anhydrous period (over 12 hours);

• inflammatory diseases of the external sexual organs, vagina (vulvitis, colpitis).

In addition, women are kept in the observation department who were transferred from the physiological postpartum department due to fever, divergence of sutures, signs of acute respiratory viral infection, diarrhea and related complications in newborn infants.

The creation of an observation department is dictated by the provision on the principles of the work of the obstetric hospital; this prevents the contact of infected women with healthy women in labor and mothers.

The structure of the Observation Obstetric Department includes:

a) the admission department;

b) the maternity ward;

c) the postpartum department;

d) separation of newborns.

The principles of operation of the structural units in the observation department are similar to the principles of work of the corresponding departments in the physiological department.

Special attention is paid to the organization of medical care for newborns in the obstetric hospital. In the maternity department, manipulative and toilet rooms are available in delivery wards. Newborn babies are dried in these rooms, they are provided with resuscitation assistance. The rooms should be equipped with special tables with heating and a set of respiratory equipment, infusomats and medicines; a children's laryngoscope, a device for suctioning mucus, a set of intubation tubes, etc. should be available.

Wards for newborns are provided in the physiological and observational units. In the physiological department, healthy newborns are on a joint stay with mothers in the postpartum wards, where the neonatologist carries out daily examinations and weighing of the newborns, the nurse carries out the treatment of the skin, the umbilical cord stump and nail phalanx of newborns.

Separate wards and a post of round-the-clock supervision are provided for preterm newborns and babies born in asphyxia, with a clinical picture of cerebral and respiratory disorders that have suffered chronic intrauterine hypoxia. Babies born as a result of caesarian delivery are placed here too. At each post for newborns, babies’ beds, medical scales for weighing newborn babies, a swaddling table are available. Wards are equipped with stationary bactericidal lamps and with medical oxygen piping installations.

Daily wet cleaning of wards is performed at least 3-5 times with the use of disinfectant solutions. After wet cleaning, the rooms are ventilated and irradiated with bactericidal lamps. Cleaning and ventilation of wards are performed during the feeding of newborns. General cleaning of nursery rooms is carried out after the discharge or transfer of newborns from the hospital.

In the observation department care is provided for babies born in this department, infants who were admitted to the maternity hospital with the mother after childbirths that occurred outside the maternity hospital, transferred because of the mother's illness from the physiological department, as well as babies born

with severe deformities, with manifestations of intrauterine infection and who were born with the weight less than 1000 g.

Babies with purulent and inflammatory diseases are to be transferred to children's hospitals on the day of diagnosis.

Gynecological department of the maternity hospital must contain not more than 1/3 of the total number of beds of the maternity hospital. Women suffering from different diseases of female genitals as well as pregnant women up to 22 weeks are hospitalized in this department. The admission procedure of patients is through a separate Inpatients Reception department.

The structure of the department comprises wards, an examination room, a room for medical procedures, a manipulation room, a dressing room as well as an operating room, a small operating room, wards of intensive care. Wards in the department must be field-specific.

There are also labs, diagnostic and treatment rooms (physiotherapeutic, X-ray examination) in maternity hospitals.

Medical record documentation

Record keepingform, №	Name
002/y	Admission register of pregnant women, women in labor and with postnatal care
096/y	Labor and delivery care record
097/y	Postnatal care record of the baby
004/y	Temperature chart
005/y	Sheet of registration of media transfusion
010/y	Sheet of delivery registration in hospital
008/y	Register of operative treatment in hospital
009/y	Register of transfusion of media
066/y	Statistics form of a discharged patient
113/y	Handover sheet of maternity hospital, maternity ward
036/y	Book of registration of sick leave certificates
103/y-84	Medical certificate of birth
106/y-84	Doctor’s certificate of death
106-2/y-84	Doctor’s evidence of prenatal death

PRENATAL CENTERS

To improve the effectiveness of obstetric care, prenatal centers are being set up to provide outpatient and inpatient highly skilled medical care for women at high risk of perinatal pathology and their children **(level III)**. Prenatal diagnostics of risk and pathological conditions of the mother and fetus is carried out in the center, corrective therapy is carried out if necessary, induced delivery is performed for women of the group of high risk of perinatal pathology, timely and adequate intensive care is given to newborns, including preterm infants. For the organization of the prenatal center, purpose-oriented financing and equipment is required, the creation of a coordinated, interactive system of obstetric and neonatal care in the region, and upgrading the skills of doctors and medical staff. The prenatal center includes a consulting and diagnostic department, obstetric and pediatric units, anaesthesiology and resuscitation units are compulsory in the obstetrics and neonatology departments, and the department of gravitational blood surgery (donation, autonomy).

Main indicators of activity in an obstetric in-patient department

Maternal mortality is the most important indicator of the quality and level of organization of maternal and child health care. The World Health Organization (WHO) defines the concept of maternal mortality as death of a woman during pregnancy or within 42 days after its termination, regardless of the reasons due to pregnancy or its management, not related to accidents.

It is generally accepted to calculate maternal mortality in absolute numbers of deaths of pregnant women, women in labor per 100,000 births of live newborns.

The formula for calculating maternal mortality:

$$\frac{\text{The number of pregnant women (from the moment of conception) women in labor, mothers (up to 42 days after delivery)}}{\text{The number of newborn babies}} \times 100000$$

Maternal mortality is classified as follows.

I. Death, directly caused by obstetric causes, i.e. obstetrical complications of pregnancy, labor, birth, postpartum period, as well as due to incorrect treatment tactics.

II. Death, indirectly connected with obstetric cause, i.e. which occurred as a result of a previous illness, not directly related to pregnancy or other obstetric causes, but whose manifestations were enhanced by the physiological effects of pregnancy.

III. Accidental death, not related to pregnancy, labor, the postpartum period or its complications and treatment.

Thus, the index of maternal mortality makes it possible to assess all the losses of pregnant women from abortion, ectopic pregnancy, obstetric and extragenital pathology during the entire gestation period and postpartum period.

Based on the expert evaluation of the causes of maternal mortality, they can be summarized as follows: 12-15% - severe extragenital pathology (diseases of the cardiovascular system, hepatitis, cancer, etc.); 25% - iatrogenic causes (errors in diagnosis, in obstetric tactics, in intensive care); 60% - obstetric complications on a severe premorbid background.

At present, the evaluation of the state of the service of obstetrics is carried out not only by analyzing maternal mortality, but also includes an assessment of the critical conditions of pregnant women, parturient women and puerperas, the so-called "near miss" cases.

WHO definition of critical cases ("near miss"): “a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy” . In practical terms, women are considered nearmiss cases when they survive life-threatening conditions (i.e. organ dysfunction)”. These are the women who did not die due to timely and adequate obstetric care.

“Near miss” these are the patients with organ dysfunction who require intensive care and transfer to the intensive care unit, who would die if there was no appropriate treatment.

According to WHO (2009), near-miss criteria are dysfunction of the cardiovascular, respiratory system, renal and / or hepatic insufficiency, dysfunction of the coagulation system (DIC), uterine dysfunction (hysterectomy due to uterine infection or bleeding).

A compilation of potentially life-threatening conditions was prepared by the WHO Working Group on the Classification of Maternal Mortality and Morbidity, and includes:

• massive postpartum hemorrhage;

• severe preeclampsia;
• eclampsia;
• sepsis / severe systemic infection;
• ruptured uterus.

To more effectively assess the quality of obstetric care, **the mortality index (MI)** is calculated:

$$\frac{\text{Maternal deaths}}{\text{near miss + Maternal deaths}}$$

A high index (> 20%) indicates a low quality of obstetric care. A low index (<5%) indicates a high quality of medical care that allows women to survive in severe maternal complications. An important condition for an adequate definition of MI is the correct registration of "near miss" cases.

Prenatal mortality - mortality in connection with labor: dead fetuses before delivery, starting from 22 weeks, pregnancy (antenatal death), during labor (intrapartum) and newborns that died within the first 7 days (168 hours) after birth.

The dead ante- and intranatal-stillbirths, their number defines the concept of **"stillbirth",** and the number of deaths in the first 7 days - the concept of **"early neonatal mortality."**

Prenatal mortality reflects the social status of the population, the health of the nation, the level of medical care in general, and obstetric care in particular, and is taken into account in all countries.

Formula to calculate prenatal mortality (in ‰):

$$\frac{\text{number of babies born dead (from 22 weeks of gestation) +the number of children who died in the first 7 days (168 hours)}}{\text{number of children born alive and dead}} \times 1000$$

Formula to calculate antenatal mortality (in ‰):

$$\frac{\text{number of babies born dead (from 22 weeks of gestation +dead in childbirth)}}{\text{number of children born alive and dead}} \times 1000$$

Formula to calculate stillbirth rate (in ‰):

$$\frac{\text{number of viable fetuses (from 22 weeks of gestation) who died before the birth of the mother)}}{\text{number of children born alive and dead}} \times 1000$$

Formula to calculate early neonatal mortality (in ‰):

$$\frac{\text{the number of children who died in the first 28 days}}{\text{number of children born alive}} \times 1000$$

Formula for calculating infant mortality (in ‰):

$$\frac{\text{The number of children who died before 1 year}}{\text{number of children born alive}} \times 1000$$

Test questions and sample answers:

1. What is the structure of a typical maternity hospital?

Sample answer:

a) admission department;

b) physiological obstetrics department;

c) observation obstetric department;

d) prenatal department (pathology of pregnant women);

e) department of newborns;

f) gynecological department.

2. What are the levels of maternity hospitals, depending on the degree of risk of prenatal pathology?

Sample answer:

level I - maternity wards of the Central District Hospital,

level II - maternity hospitals,

level III - regional maternity hospitals of general hospitals, prenatal centers.

3. What is the structure of the physiological obstetrics unit?

Sample answer:

a) admission department;

b) maternity ward;

c) postpartum wards;

d) examination room;

e) procedures room;

e) operating room;

g) department of newborns;

h) a room for discharge.

4. What is the structure of the Observation Obstetric Department?

Sample answer:

a) admission department;

b) maternity ward;

a) postpartum wards;

d) examination room;

e) a room for procedures;

f) wards for newborns healthy and sick (separately), bed capacity is 20-25% of the total number of beds in the hospital.

5. What is the structure of the maternity unit?

Sample answer:

a) wards for maternity patients (halls);

b) small operating room;

c) intensive care unit for women with severe forms of pre-eclampsia;

d) a sanitary room;

e) toilet.

6. What are the indications for hospitalization in the physiological obstetric ward?

Sample answer: healthy pregnant women and women in labor with a normal temperature, without manifestations of infection and skin diseases are to be hospitalized.

7. What are the indications for hospitalization in the observation department?

Sample answer:

a) contact with infectious patients of the pregnant woman and the mother in childbirth;

b) a rise in temperature above 37.5 °C, with an unclear diagnosis, without signs of any infection;

c) skin diseases;

d) dead fetus;

e) late miscarriage without signs of infection;

f) women after delivery at home and outdoor birth;

g) mothers from the physiological department after a one- or two-time rise in temperature (over 38°);

h) ARVI;

i) diarrhea.

8. What are the indications for hospitalization in the antenatal clinic?

Sample answer:

a) pre-eclampsia of pregnant women;

b) threatening premature termination of pregnancy;

c) polyhydramnios;

e) bleeding during pregnancy;

f) narrow pelvis;

g) transverse or oblique position of the fetus;

h) pelvic presentation of the fetus;

i) undeveloped pregnancy;

k) Rhesus-conflict;

l) extragenital pathology during pregnancy beyond 28 weeks;

m) anemia of pregnant women;

n) anomalies in the development of internal sex organs.

9. What are the main qualitative indicators of maternity hospital activities?

Sample answer:

Maternal mortality, prenatal mortality.

10. How to calculate the index of maternal mortality?

Sample answer:

$$\frac{\text{The number of deceased pregnant women (from the moment of conception), pregnant women, puerperas (up to 42 days after termination of pregnancy)}}{\text{Number of live births}} \times 100000$$

11. How to calculate the index of prenatal mortality?

Sample answer:

$$\frac{\text{number of babies born dead (from 22 weeks of gestation) +the number of children who died in the first 7 days (168 hours)}}{\text{number of children born alive and dead}} \times 1000$$

A student should know:

1. structural subdivisions of a maternity hospital, the distribution of hospital bed capacity by departments.

2. indications for hospitalization and transfer of parturient women / mothers to the Observation Obstetric Department.

3. indications for transfer of newborns to the department of neonatal pathology.

4. medical equipment of the maternity ward, the postpartum departments, and the neonatal departments.

5. sanitary-epidemiological mode of a maternity hospital:

a) sanitary requirements for clothes of the staff of a maternity hospital;

b) the amount of sanitary treatment of the staff of a maternity hospital;

c) the volume of sanitation of staff - carriers of pathogenic flora;

e) the cyclic principle of filling in and cleaning of postpartum wards and wards of newborns;

g) the volume and periodicity of the sanitary treatment of the delivery room, prenatal wards;6. The main indicators of work of a maternity hospital: maternal, prenatal mortality, stillbirth, "near miss", the death rate index.

A student should have the following practical skills:

1. Competent keeping of medical documentation.

2. to determine indications for hospitalization in the physiological or observation department.

3. calculation of the basic parameters of a maternity hospital.

4. measurement of body temperature.

5. general examination of skin, mucous membranes.

6. measurement of blood pressure, pulse count.

7. palpation of the abdomen, peripheral lymph nodes.

8. examination of throat and taking smears for bacteriological inoculation from the nose and throat for flora.

Questions for self-study work:

1. Organization of obstetric and gynecological care in the Russian Federation.

2. Structure and organization of work of prenatal centers.

3. Organization of prenatal screening in Russia.

4. Medical records of the obstetric-gynecological profile.

5. Assessment of the quality of medical obstetric-gynecological care based on qualitative and quantitative indicators.

6. Medical evacuation of pregnant women, parturient women, mothers with emergency conditions.

Topic 2
COMPONENTS OF THE DELIVERY ACT. OBJECTIVE TERMINOLOGY

Objective of the class: To study the components of the delivery act, to familiarize students with obstetric terminology.

Place: Training room, prenatal room, maternity room, antenatal clinic, neonatal department, simulator class.

Visual aids: pelvis, obstetric phantom, doll, tasomer, centimeter tape, models, tables:

1. Comparative characteristics of the male and female pelvis;
2. The size of the large pelvis;
3. Plane of the small pelvis and their sizes;
5. The structure of the skull and the size of the head of the full-term fetus;
6. Fetal position in the uterus;
7. The type and position of the fetus;
8. Pelvic presentation of the fetus;
9. The transverse position of the fetus in the uterus.

Contents of the class:

Childbirth is a complex physiological expulsion process of a viable fetus from the uterus with additional embryonic formations through the birth canal under the influence of expulsive forces.

The three main components of labor are:

• expelling forces;
• birth canal;
• fetus.

The first component of the delivery act is expelling forces. Contractions and powers belong to the expelling forces.

Contractions are periodic contractions of the smooth musculature of the uterus. Contractions arise involuntarily, the gravida cannot manage them at will.

Uterine activity (Powers) - contractions of the striated muscles of the abdominal, diaphragm and pelvic floor. Uterine activity occurs reflexively due to the irritation of the fetal nerve endings that are present in the cervix, parametric fiber and pelvic floor muscles by the fetal part. Powers arise involuntarily, but the parturient can, to a certain extent, regulate them (strengthen the effort or slow it down).

The second component of the childbirth is the birth canal. The birth canal is represented by the lesser pelvis, the vagina, the cervix of the uterus, muscles of the pelvic floor.

THE FEMALE PELVIS

The bony pelvis has a great importance in obstetrics.

It forms the birth canal along which the fetus progresses.

Differences in the structure of the female and male pelvis begin to manifest during puberty and become pronounced in adulthood. Bones of the female pelvis are thinner, smooth and less massive than the bones of the male pelvis, the female pelvis is lower, wider and larger in volume. The sacrum in women is wider and not as strongly concave as in men, the sacral promontory is less protruded anteriorly, the symphysis of the female pelvis is shorter and wider. The inlet to the lesser pelvis is wider in women, the shape of the inlet is transversely oval, with a notch in the area of the sacral promontory. The cavity of the lesser pelvis is larger in women, in its shape is closer to the cylinder curved anteriorly; The cavity of the male pelvis is smaller, it narrows downward in a funnel-shaped manner. The outlet of the female pelvis is wider, as the distance between the ischiatic tubers is greater, the pubic angle is wider (90-100°) than in men (70-73°), and the coccyx is anteriorly protruded less than in the male pelvis. Thus, the female pelvis is more voluminous, wider, but less deep than the male one. These features are of great importance in the process of the delivery act.

The pelvis of an adult woman consists of four bones: two pelvic (or hip bones), sacrum and coccyx (fig. 2.1).

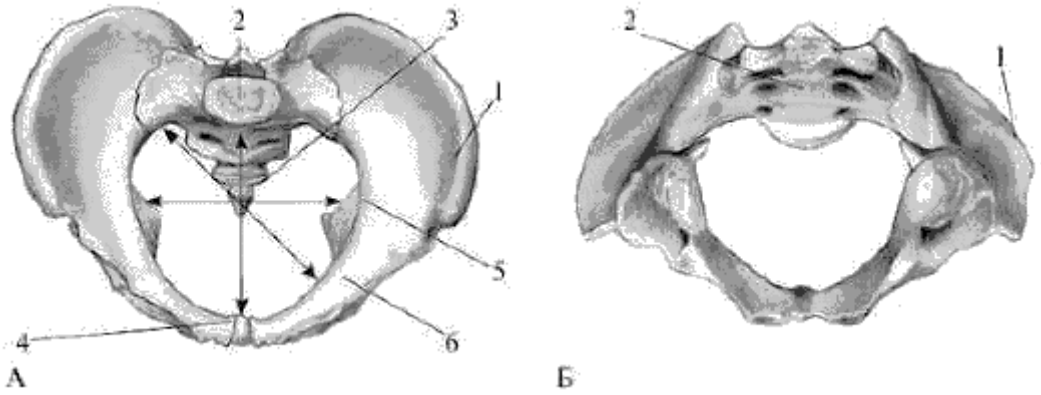


Fig. 2.1. Female pelvis. A – top view; B – bottom view;
1 – pelvic bones; 2 - sacrum; 3 - coccyx; 4 –antero-posterior diameter of the pelvic brim (true conjugate); 5 –transverse diameter of the pelvic brim; 6 –oblique diameter of the pelvic brim

Hip bone (os coxae) before the age of 16-18 it is composed of three bones connected with cartilages: ilium, pubis and ischium. After cartilaginous ossification the specified bones fuse together forming the hip bone.

Ilium (os ilium) is composed of two parts: the body and the wing. The body is a short thickened part of the bone that participates in the formation of the acetabulum. The wing represents a wide plate with the concave internal and convex external surface. The most expanded free edge of the wing forms the crest of the ilium (crista iliaca).

From the front, the crest begins with the anterior iliac spine, or protrusion (spina iliaca anterior superior), and the lower anterior inferior (spina iliaca anterior inferior) is lower. The crest of the ilium at the back ends with the superior posterior iliac spine (spina iliaca posterior superior), below which there is a second protrusion - the lower posterior iliac posterior (spina iliaca posterior inferior). On the inner surface of the iliac bone in the area of the wing transition, the crest protruding into the body forms an arcuate, or borderline, or anonymous line (linea arcuata, s.terminalis, s.innominata). This line runs from the sacrum across the entire iliac bone, in front passes to the upper edge of the pubic bone.

The ischium (os ischii) consists of the body participating in the formation of the acetabulum and two branches: the upper and lower one. The upper branch goes from the body downward and ends with a sciatic tubercle (tuber ischiadicum). The lower branch is directed anteriorly and upward and connects with the lower branch of the pubic bone. On the posterior surface of the lower branch there is a protrusion - the ischial spine (spina ischiadica).

The pubic bone (os pubis) forms the front wall of the pelvis. It consists of the body and two branches: the upper (horizontal) and the lower (descending). The short body of the pubic bone forms the part of the acetabulum, the lower branch is connected to the corresponding branch of the ischium.

The upper and lower branches of both pubic bones in front are connected to each other by means of an inactive pubic articulation - symphysis. Both pubic bones are joined in symphisis by an the intermediate cartilage, in which there is often a small slit-shaped cavity filled with liquid. The lower branches of the pubic bones form the symphysis angle, which is called the pubic arch. The connecting branches of the pubic and sciatic bones restrict rather extensive obturator foramen (foramen obturatorium).

The sacrum (os sacrum) consists of five fused vertebrae. The size of the sacral vertebrae decreases in the direction downward, so the sacrum has the shape of a truncated cone. Its wide part - the base of the sacrum - faces upward, the narrow part - the tip of the sacrum - down. The posterior surface of the sacrum is convex, the anterior surface is concave, it forms a sacral cavity. The base of the sacrum (the surface of the I sacral vertebra) is articulated with the V lumbar vertebra; in the middle of the anterior surface of the base of the sacrum, a protrusion - sacral promontory (promontorium) is formed.

The coccyx (os coccygis) consists of 4-5 rudimentary fused coccygeal vertebrae, is a small bone, diminishing in size from above downward.

Pelvic bones are connected by symphysis, sacroiliac and sacrococcygeal joints. Cartilaginous layers are located in the joints of the pelvis. The joints of the pelvis are strengthened by strong ligaments.

The pelvis from the obstetric point of view

There are two parts of the pelvis: **the greater pelvis** and **the lesser pelvis**. The border between them is the border line (L. terminalis), which runs along the upper edge of the symphysis and pubic bones, from the sides - arcuate lines of the iliac bones, behind - the sacral promontory (promontorium). The plane lying between the greater and lesser pelvis is the *plane of the inlet into the lesser pelvis (pelvic brim).*

The greater pelvis is much wider than the lesser one; it is bounded laterally by the wings of the iliac bones, behind - the last lumbar vertebrae, in front - the lower abdominal wall. The greater pelvis is of no essential significance for the birth of a child. The bone basis of the birth canal, which represents an obstacle to the fetus, is the lesser pelvis. However, in terms of the dimension of the greater pelvis, you can indirectly judge the shape and diameter of the lesser pelvis. The greater pelvis is available for research, its dimensions are determined quite accurately. Four dimensions are usually measured for the greater pelvis: three transverse and one antero-posterior (fig. 2.2).

1. **Distantia spinarum** - the distance between the upper anterior iliac spine bones. The buttons of the pelvimeter are pressed against the outer edges of the anterior iliac spine bones. This size usually is 25-26 cm.

2. **Distantia cristarum** – the distance between the most distant points of wings of the iliac bones. After measuring d.spinarum the buttons of the

pelvimeter are shifted from the spines on the outer edge of the crest of iliac bones until the greatest distance can be measured: this distance is d.cristarum, on average it is 28-29 cm.

3. **Distantia trochanterica** – the distance between the trochanter major of hip bones. The most prominent points of the great trochanter are found and the buttons of the pelvimeter are pressed against them. This size 31-32 cm.

• **Conjugata externa** is the outer conjugate, i.e. antero-posterior pelvis diameter. The woman is laid on her side, the lower leg is bent in the hip and knee joints, the overlying one is stretched. The button of one branch of the pelvimeter is placed in the middle of the upper margin of the symphysis, the other end is pressed to the supracracial fossa, which lies between the spinous process of the last lumbar vertebra and the beginning of the middle sacral ridge. The external conjugate is normally 20 to 21 cm.

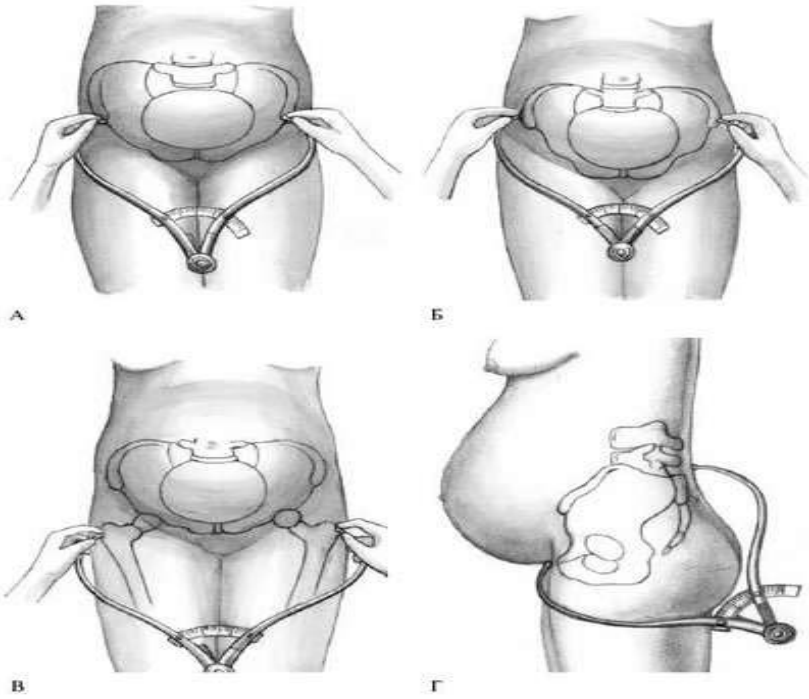


Fig. 2.2. Measurements of pelvis dimensions:
А - Distantia spinarum; Б - Distantia cristarum; В - Distantia trochanterica;
Г - Conjugata externa

The external conjugate is important, by its magnitude one can estimate the size of the true conjugata vera.

To determine the true conjugates from the length of the external conjugate, subtract 9 cm. The difference between the external and the true

conjugate depends on the thickness of the sacrum, symphysis and soft tissues. The thickness of bones and soft tissues in women is different, so the difference between the size of the external and the true conjugates does not always exactly correspond to 9 cm. The true conjugate can be more accurately determined by the diagonal conjugate.

5. **Diagonal conjugate (conjugata diagonalis)** – is the distance from the lower margin of the symphysis to the most prominent point of the sacral promontory. Diagonal conjugate is determined by vaginal examination and on average is 13 cm. To determine true conjugate of this diagonal diameter 2 cm is subtracted (fig. 2.3).

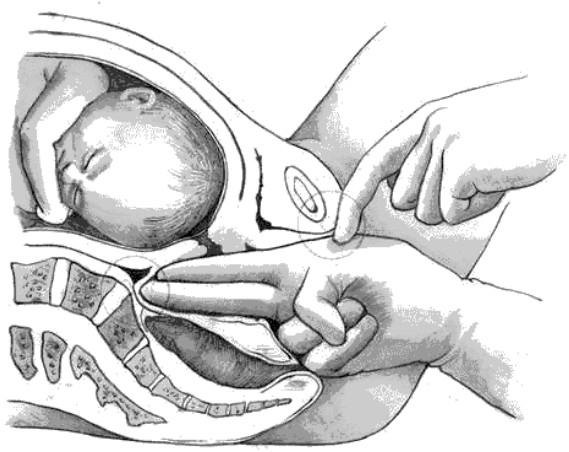
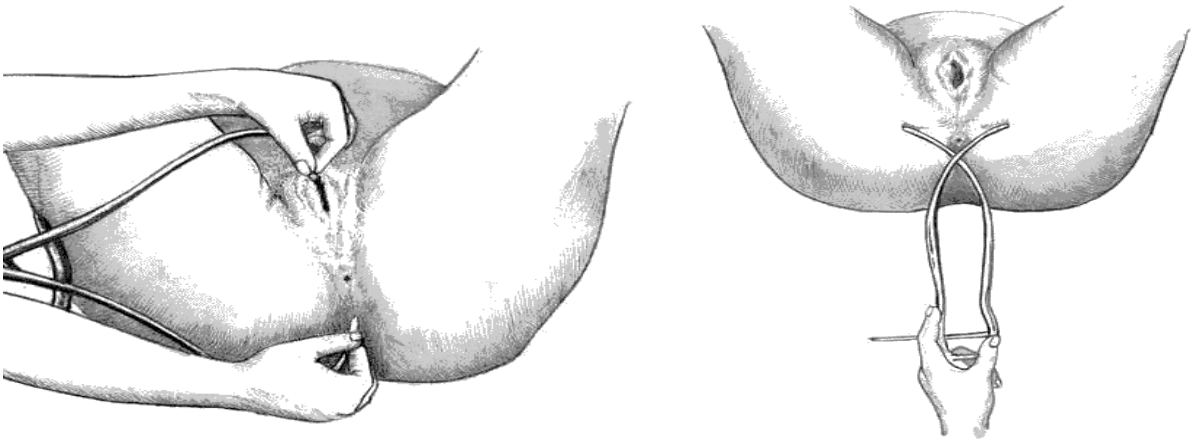


Fig. 2.3. Measurement of diagonal conjugate

When examining a woman there is suspicion that the outlet of the pelvis is narrow, then the dimensions of the pelvic outlet plane are determined. The dimensions of the pelvic outlet are determined in the following way. The woman lies on her back, her legs are bent in the hip and knee joints, apart and pulled to the stomach.

The anteroposterior diameter of the pelvic outlet is measured by a conventional pelvimeter. One button of the pelvimeter is pressed to the middle of the lower edge of the symphysis, the other to the tip of the coccyx (fig. 2.4, A). The resulting dimension (11 cm) is more than true. To determine the antero-posterior diameter of the pelvic outlet, subtract 1.5 cm (thickness of the tissues) from this value. In a typical pelvis, the antero-posterior dimension of the plane is 9.5 cm.



A B

Fig. 2.4. Measurement of the pelvic outlet area:
A – antero-posterior diameter; B – transverse diameter

The transverse diameter of the outlet is the distance between the internal surfaces of the ischium bones which is difficult to measure. This dimension is measured with a centimeter tape or a pelvimeter with its branches crossed in the position when the woman is on the back with the legs pulled to the abdomen. In this area, there is a subcutaneous fatty tissue, so 1-1.5 cm is added to the obtained dimension value. Normally, the transverse diameter of the pelvic outlet is 11 cm (Fig. 2.4, b).

The lesser pelvis is the boney part of the birth canal. The cavity of the lesser pelvis is the space enclosed between the walls of the pelvis, top and bottom limited by the planes of the inlet (superior aperture) and the outlet (inferior aperture) of the pelvis. It has the form of a cylinder truncated from front to back, the front part facing the pubic bone almost 3 times lower than the posterior one, facing the sacrum. In connection with this form of the cavity of the lesser pelvis, its different sections have different shapes and dimensions. These regions are imaginary planes passing through the recognition points of the inner surface of the lesser pelvis.

In the lesser pelvis, the following planes are distinguished: the inlet plane, the broad part plane, the narrow part plane and the outlet plane.

1. The plane of the lesser pelvis inlet has the following boundaries: in front the upper inner edge of the lumbar arch, from the sides - arcuate lines of the iliac bones, behind - the sacral promontory. In the inlet plane, the following diameters are distinguished: anteroposterior, transverse and two oblique ones.

The antero-posterior diameter is the shortest distance from the sacral promontory to the most prominent point on the inner surface of the upper edge of the symphysis. This distance is called the true or obstetric conjugate (conjugata vera); it measures 11 cm. It is also generally accepted to distinguish between the anatomical conjugate - the distance from the most prominent point of the sacral promontory to the middle of the upper edge of the symphysis; it is by 0.2 to 0.3 cm longer than the true conjugate.

The transverse diameter is the distance between the most distant points of arcuate lines, it measures 13-13.5 cm.

Oblique diameters - right and left.

The right oblique diameter passes from the right sacroiliac joint to the left iliopectineal eminence, and the ***left oblique diameter*** passes from the left sacroiliac joint to the right iliopectineal eminence, respectively. Each measures 12 cm.

2. The plane of the wide part of the cavity of the lesser pelvis has the following boundaries: in front - the middle of the inner surface of the symphysis, on the sides - the middle of the acetabulum, behind - the junction of the II and III sacral vertebrae. In the wide part of the pelvic cavity, the following diameters are distinguished: ***antero-posterior diameter*** - from the articulation of II-III sacral vertebrae to the middle of the inner surface of the symphysis; it is equal to 12.5 cm;

The transverse diameter is between the center points of the acetabulum; it is equal to12.5 cm.

3. The plane of the narrow part of the cavity of the lesser pelvis is limited in the front by the lower edge of the symphysis, from the sides - by the sciatic bones; in the back – the sacrococcygeal articulation. In the plane of the narrow part, the following diameters are distinguished:

Antero-posterior diameter - from the sacrococcygeal joint to the lower edge of the symphysis; it is 11-11.5 cm;

The transverse diameter is between the inner surface of the ischial spine; it is 10.5 cm.

4. The outlet plane of the lesser pelvis has the following boundaries: in front - the lower edge of the symphysis, from the sides – ischial tuberosities, behind - the apex of the coccyx. In the outlet plane, the following dimensions are distinguished:

Antero-posterior diameter - from the apex of the coccyx to the lower edge of the symphysis; it is 9.5 cm.

The transverse dimension is between the inner surfaces of the ischial tuberosities; it is 11 cm.

The antero-posterior outlet size due to some coccyx mobility can be prolonged in childbirth when the fetal head passes by 1-2 cm and reaches 11.5 cm.

The antero-posterior diameters of the lesser pelvis planes converge in the area of the pubic symphysis, and in the region of the sacrum they diverge. The line joining the center points of each of the four planes of the lesser pelvis is called the pelvic axis (**Pelvic Axes /*Anatomical axis (curve of Carus)*** It is an imaginary line joining the centre points of the planes of the inlet, cavity and outlet.) and represents a curved line concave in front and convex from behind (the shape of the fish hook) (fig. 2.5). In a woman standing in an upright position the pelvic axis at the inlet and in the wide part is directed obliquely to the back, in the narrow part - downward, in the outlet of the pelvis - anteriorly. The fetus passes through the birth canal along the pelvic axis.

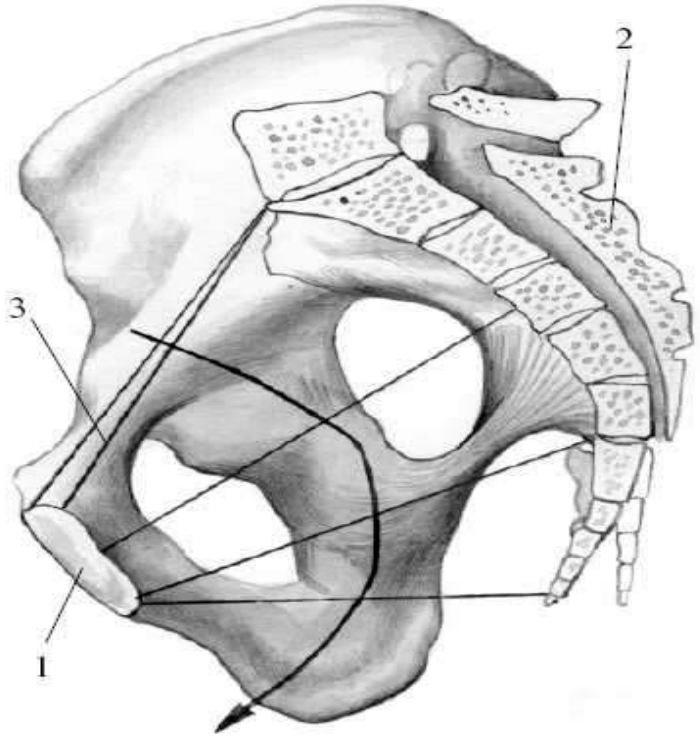


Fig. 2.5. The axis of the lesser pelvis.1 - symphysis; 2 - sacrum; 3 - the true conjugate

The inclination angle of the pelvis - the intersection of the plane of the pelvic inlet with the horizon plane is very important for the passage of the fetus through the birth canal (fig. 2.6).

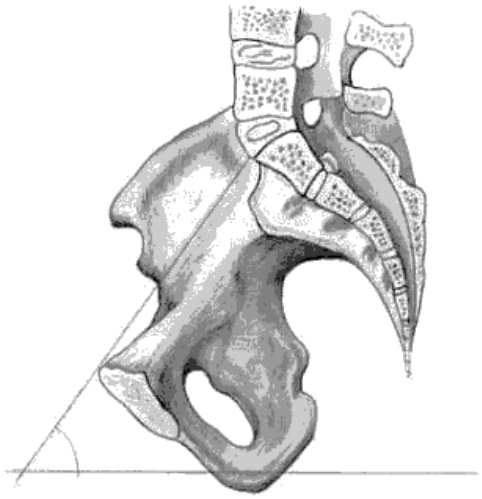


Fig. 2.6. Inclination angle of the pelvis

The inclination angle of the pelvis in the upright position of a woman can be different depending on the constitution and ranges from 45 to 55 degrees. It can be reduced if you ask a woman lying on her back to pull the hips heavily to the abdomen, which leads to the elevation of the womb, or, conversely, can be increased if a pillow is placed under the waist, which will lead to a deviation of the womb downwards. Reducing the inclination angle of the pelvis is also achieved if the woman takes a squat position.

The perineum and the pelvic floor

The outlet of the pelvis is closed from the bottom with a powerful muscular-fascial layer called the ***pelvic floor***. The pelvic floor is of great importance in maintaining the internal genital organs in a normal position. With the rise of the intra-abdominal pressure, the cervix rests on the pelvic floor, as on a pedestal; muscles of the pelvic floor prevent the descent of the genitals and viscera downward.

The perineum (perintum) is a rhomboid area between the hips and buttocks, where the urethra, vagina and anus are located. In front the perineum is limited with the pubic symphysis, behind - the tip of the coccyx, lateral-ischial tuberosities. The skin limits the perineum from the outside and from the bottom, and the pelvic diaphragm (pelvic fascia), formed by the lower and upper fascia, limits the perineum deeply from above (fig. 2.7).

The pelvic floor is divided anatomically into two triangular regions using an imaginary line connecting two ischial tuberosities: in front - the genitourinary area, behind - the anal region. In the center of the perineum between the anus and the vaginal orifice, there is a fibro-muscular mass called the perineal body (or central tendon of the perineum). This tendon is the place of attachment of several muscle groups and fascial layers.

The pelvic floor consists of three layers of muscles covered with fascia.

1. The lower (outer) layer consists of muscles that converge in the central tendon of the perineum; the shape of the arrangement of these muscles resembles number eight suspended to the bones of the pelvis:

- *the bulbous cavernous muscle (m. bulbocavernosus)* encircles the orifice to the vagina, is attached to the central tendon and clitoris: when contracted, this muscle contracts the vaginal orifice;
- *the ischoconstantis muscle (m. ishiocavernosus)* begins from the ischial tuberosity of the lower leg of the ischium and is attached to the clitoris;
- *the superficial transverse muscle of the perineum (m. fransversus perinea superficialis*) starts from the lower branch of the ischium, ends in the central tendon of the perineum;
- *the external sphincter of the anus (m. sphincter ani externus)* – the muscle that compresses the terminal part of the rectum.

Deep bunches of muscles start from the apex of the coccyx, wrap around the anus and end in the perineal body.

2. The middle layer - the urogenital diaphragm (diafragma urogenitalis) - occupies the anterior half of the pelvic outlet. The urogenital diaphragm is a triangular muscular-fascial plate located between the lower branches of the sciatic and pubic bones. The urethra and the vagina pass through this layer. In the anterior part of the urogenital diaphragm, the muscle bundles surround the urethra and form its outer sphincter; Muscular bundles are laid in the posterior section, going in the transverse direction to the ischial tuberosities. This part of the urogenital diaphragm is called the *deep perineal transverse muscle (m. Fransversus perinea profundus).*

3. The upper (inner) layer is called the diaphragm of the pelvis (diafragma pelvis). The diaphragm of the pelvis consists of a *paired muscle that lifts the anus (m. Levator ani).*

Under the skin and superficial fascia there are sciatic-cavernous and spongy-bulbous, as well as transverse superficial muscles. The tendons of these muscles are connected along the middle line in the central tendon of the perineum (fig. 2.7): the ischial-cavernous muscle covers the skin of the clitoris, moving away from the ischium; bulbous cavernous muscle covers the bulb of the vestibule and passes into the perineal body; the superficial transverse muscle of the perineum extends from the ischium to the central tendon.

During labor, in the course of the expulsion of the fetus, all three layers of the pelvic floor muscles stretch and form a broad tube, which is the continuation of the osseous birth canal. After the birth of the fetus, the muscles of the pelvic floor again contract and take the former position.

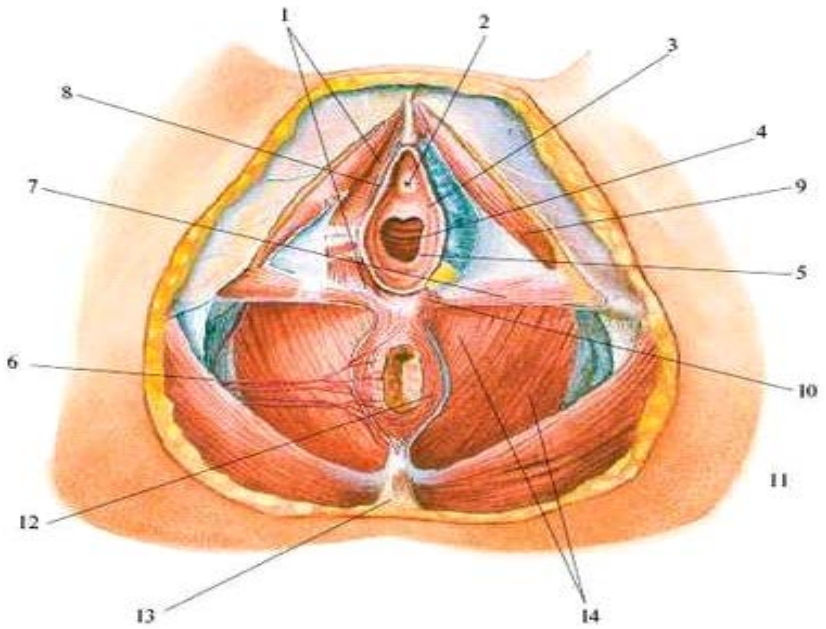


Fig. 2.7. Female perineum:

1 - urogenital diaphragm;
2 - external aperture of the urogenital channel;
3 - small labia;
4 – vaginal orifice;
5 - the margin of the hymen;
6 - internal sexual artery;
7 - superficial perineal transverse muscle;
8 - muscles of the sphincter of the urethra and vagina;
9 - ischial-cavernous muscle;
10 - bulbocavernous muscle (cut off);
11 – central tendon of the perineum;
12 - external sphincter of anus;
13 - anal-coccygeal ligament;
14 - muscle lifting the anus (m. Pubococcygeus, m. Iliococcygeus, m. Ischio coccygeus)

Fetus as the object of labor

Pregnancy on average lasts 280 days, or 10 obstetric months, or 40 weeks. If the birth occurred at 38-40 weeks of pregnancy, then such births are called urgent, i.e. which occurred on time. Full term newborn is born as a result of term births, whose excess weight 2500.0 g (average 3200-3500,0 g) and the height of which is over 46 cm (average 50-52 cm). The newborn has signs of maturity: the breast is convex, the umbilical ring is in the middle between the womb and the xiphoid process, the skin is pale pink; the subcutaneous fat layer is well developed; Remains of a damp grease on the skin; Vellus hair is only on the shoulders and upper back; the length of the hair on the head reaches 2 cm, the fingernails go beyond the fingertips; ear and nasal cartilages are elastic; in boys, the testicles are lowered into the scrotum, the girls have small labia and the clitoris is covered with large labia. The movements of the mature newborn are active, the cry is loud, the eyes are open, it takes the breast well.

If the pregnancy is interrupted in a period of 22-37 weeks, then this pregnancy is called premature, and childbirth is premature. Infants born from premature birth are called premature babies. The body weight of children varies from 500 to 2500 grams, and the height is from 26 to 46 cm. Characteristic signs of immaturity: squeaky cry, crimson skin, their turgor is reduced, covered with vellus hair and damp grease; Ear cartilage and nasal cartilages are soft; hair on the head less than 2 cm; nails do not cover the terminal phalanges; the umbilical ring is located closer to the symphysis; in boys, the testicles are not lowered into the scrotum, in girls, the large labia does not cover the small labia.

Interruption of pregnancy in the period from conception to 22 weeks is called miscarriage or abortion. The abortus is a fetus whose mass is less than 500.0, and the height is less than 26 cm.

The study of the shape and size of the full-term fetus head is of particular importance in obstetrics. In the overwhelming majority of births (96%), the head first passes through the birth canal, making a series of successive movements - turns.

The head, in view of its density and magnitude, experiences the greatest difficulties when passing through the birth canal. After the birth of the head, the birth canals are usually sufficiently prepared to advance the trunk. The study of the head is important for the diagnosis and prognosis of childbirth: according to

the location of the sutures and fontanels, the mechanism of birth and their course is assessed.

The head of a mature fetus has a number of characteristics. Facial bones are connected firmly. The bones of the cranial part of the head are connected by fibrous membranes, which determine the known mobility and displaceability with respect to each other. These fibrous membranes are called sutures. Small spaces in the intersection of sutures are called fontanel. When the head passes through the birth canal, the sutures and fontanels allow the bones of the skull to go for each other. This process is called ***a configuration.***

The fetal skull consists of two frontal, two parietal, two temporal and one occipital, sphenoid and ethmoid bones (fig. 2.8).

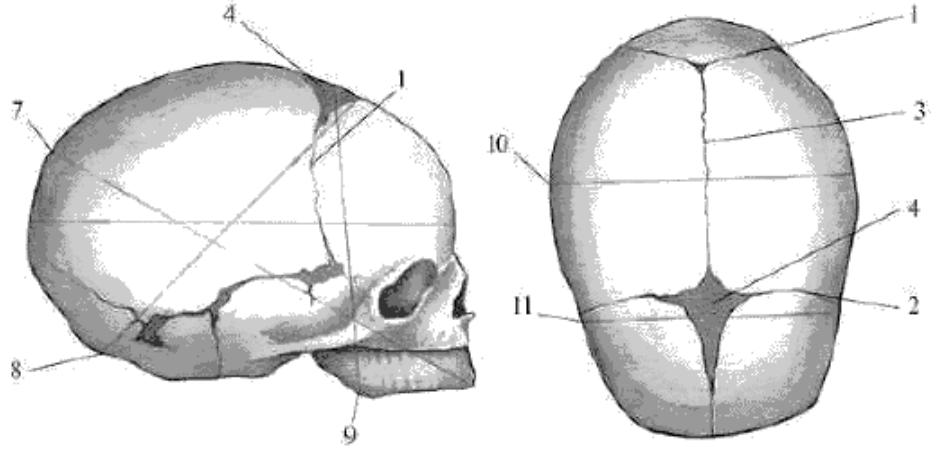


Fig. 2.8. Fetal skull:

1 – the lambdoid suture;
2 – the coronal suture;
3 – the sagittal suture;
4 – the anterior (greater) fontanel;
5 – the posterior (lesser) fontanel;
6 – antero-posterior diameter;
7 – great oblique diameter;
8 – small oblique diameter;
9 – vertical diameter;
10 – great transverse diameter;
11 – small transverse diameter

In obstetrics, the following sutures are of particular importance:

The sagittal (arrow-shaped) suture (sutura sagitalis) connects the right and left parietal bones; In front, the suture passes into the anterior fontanelle, in the back - into the posterior.

The frontal suture (sutura frontalis) is between the frontal bones, the sagittal suture has the same direction.

The coronal suture - (sutura coronalis) connects the frontal bones with the parietal bones, passes perpendicular to the sagittal and frontal sutures.

Lambdoid suture (occipital) suture (sutura lambdoidea) connects the occipital bone with parietal.

In the area of the joints between the sutures are the fontanels. the anterior (large) and posterior (small) fontanels are of practical value.

The anterior fontanel (fonticulus anterior) is located at the junction of the sagittal, frontal and coronal sutures, and has a rhomboid shape. From the anterior fontanel four sutures branch off: to the front - frontal, to the back - sagittal, to the right and left - the corresponding sections of the coronal suture.

The posterior fontanel (fonticulus posterior) is a small vallecula in which the sagittal and lambdoid sutures converge. The posterior fontanelle has a triangular shape; from the posterior fontanelle three sutures branch off: sagittal anteriorly, to the right and to the left corresponding sections of the lambdoid suture.

The following dimensions are distinguished on the head of a full-term fetus:

1. Occipito-frontal diameter (diametr frontoocipitalis) from the occiput to the midfrontal bone - 12 cm. The head circumference correspondent to the anteroposterior diameter is 34 cm.

2. Supraoccipitomental diameter (d. mentooccipitalis) – this measurement is taken from the chin to the occiput - 13,0-13,5 cm. The head circumference corresponding to this size is - 38-42 cm.

3. Suboccipito-bregmatic diameter (d. suboccipitobregmaticus) – this measurement is taken from below the occiput to the front corner of the anterior fontanel - 9,5 cm; the head circumference correspondent to this size is 32 cm.

4. Suboccipito-frontal diameter (d. suboccipitofrontalis) - from the suboccipital fossa to the border of the fibrous bones of the forehead - 10 cm. The circumference of the head corresponding to this size is 33 cm.

5. Mento-vertical (d. verticalis) - the length from the vertex to the hyoid bone is 9.5 (circumference is 32 cm).

6. Biparietal diameter (d. biparietalis) – the greatest length between the parietal tubercles is 9-9.25 cm.

7. Bitemporal diameter (d.bitemporalis) - the length between the most distant points of the coronal suture is 8 cm.

In obstetrics, the conditional division of the head into large and small segments is also accepted. T***he largest segment*** of the fetal head is its largest circumference, which it passes through the plane of the true pelvis. Depending on the variety of the fetal head presentation, the largest circumference of the head, to which the fetus passes through the plane of the true pelvis, is different. In the occipital presentation (flexed head position), its large segment is a circle in the plane of the small oblique diameter; with an anteroposterior presentation (moderate deflexion of the head) - a circle in a plane of the anteroposterior diameter; with frontal presentation (pronounced deflexion of the head) - in the plane of the large oblique diameter; in the face presentation (maximum deflexion of the head) - in a plane of the vertical size.

A small segment of the head is called any diameter that is smaller than a large one.

Body dimensions:

1. The size of the shoulders is 12 cm, the circumference of the shoulder girdle is 35 cm.

2. The transverse size of the buttocks is 9-9.5 cm, the circumference is 28 cm.

Obstetric terminology

Fetal position (situs) - the relation of the longitudinal axis of the fetus to the longitudinal axis of the uterus.

There are the following positions of the fetus:

a) longitudinal (situs longitudinalis) - the longitudinal axis of the fetus coincides with the longitudinal axis of the uterus (fig. 2.9);

b) transverse (situs transversus) - the longitudinal axis of the fetus crosses the longitudinal axis of the uterus at a right angle (fig. 2.10);

c) oblique (situs obliquus) - the longitudinal axis of the fetus forms an acute angle with the longitudinal axis of the uterus (fig. 2.10);

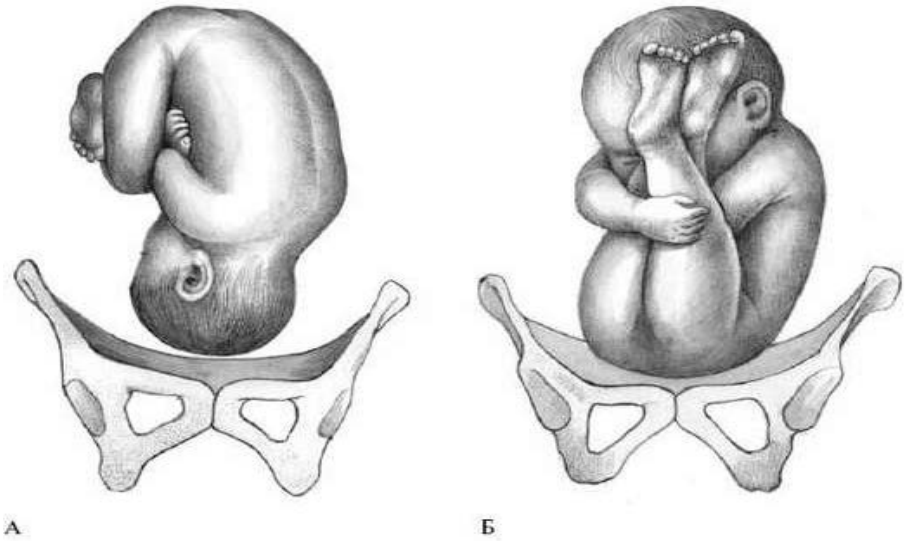


Fig. 2.9. Longitudinal lie of the fetus:
А - longitudinal vertex; Б - longitudinal breech

The difference between the oblique position and the transverse one is the location of one of the large parts of the fetus (pelvis or head) in relation to the crests of the iliac bones. In the oblique position of the fetus, one of its large parts lies below the crest of the ilium. The normal longitudinal position of the fetus is observed in 99.5% of all births. Transverse and oblique positions are considered pathological, they occur in 0.5% of births.

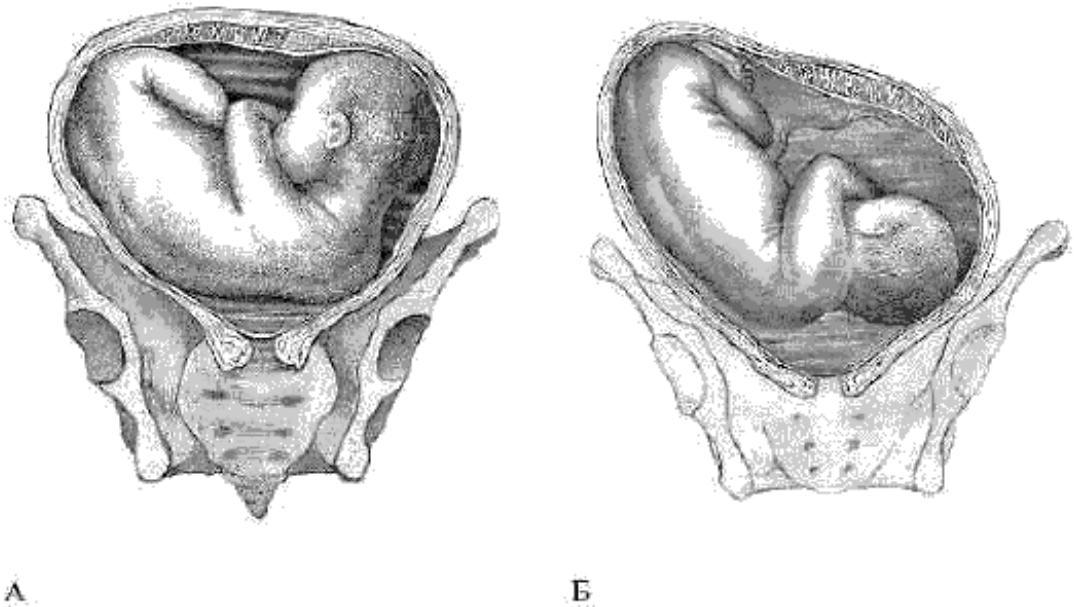


Fig. 2.10. Transverse and oblique lie of the fetus:
А - transverse lie of the fetus;
Б - oblique lie of the fetus

The position of the fetus (positio) - the relation of the back of fetus to the right and left sides of the uterus. There are two positions: the first and the second. In the first position, the back of the fetus faces the left side of the uterus, in the second – the back faces the right side. The first position occurs more often than the second, which is explained by the turning of the uterus with its left side to the front. The back of the fetus is not only turned to the right or left, but also somewhat to the anterior or posterior, depending on which the position is distinguished (fig. 2.11). With the transverse and oblique positions of the fetus, the position is determined not by the back, but by the head: the head on the left is the first position, the head on the right is the second position.

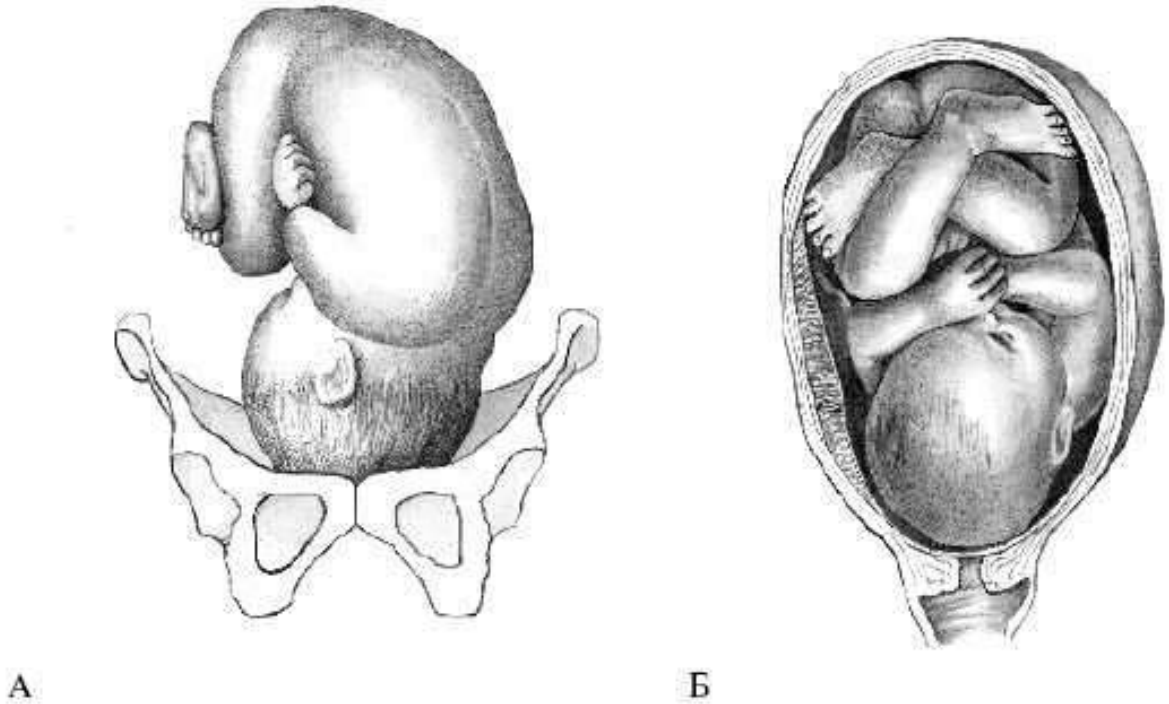


Fig. 2.11. Position of the fetus:
А - the first position, the anterior type; Б - the first position, the posterior type

Position type (visus) - the relation of the fetal back to the anterior or posterior wall of the uterus. If the back faces the anterior wall, one can speak about the anterior type if it faces the posterior wall - about the posterior.

Presentation of the fetus (praesentatio) - the relationship of the large part of the fetus body (head or buttocks) that lies closest or has entered the pelvic inlet. If the head is above the entry into the true pelvis, the presentation *is cephalic (head first)*, if buttocks first is *the breech presentation.*

There are several variants of the cephalic presentation:

a) the occiput is turned to the inlet of the lesser pelvis - occipital;

b) the vertex (crown) of the head faces the inlet of the lesser pelvis - vertex;

c) the forehead faces the inlet of the true pelvis - sinciput;

d) the face of the fetus faces the inlet of the true pelvis - face.

Occipital presentation refers to the flexion type. Anterior, frontal, facial presentation - to the extention type.

In a breech presentation, the buttocks of the fetus (frank breech presentation), legs (leg presentation), buttocks with legs (mixed breech presentation) can be directed to the inlet of the maternal pelvis.

Attitude (habitus) - the relationship of the extremities of the fetus to the head and body. In a typical normal attitude, the body is flexed, the head is tilted to the chest, the legs are flexed in the hip and knee joints and are pressed to the stomach, the arms are crossed on the chest.

Insertion of the head (inclinatio) - the ratio of the sagittal suture to the sacral promontory and symphysis. There are axial or synclic insertion of the head and off-axis or asynclic:

synclic insertion - the sagittal suture is at the same distance from the sacral promontory and womb;

asynclitic insertion - the sagittal suture deviates either to the sacral promontory or to the womb.

If the sagittal suture is deflected to the sacral promontory, the anterior parietal bone is inserted into the inlet of the true pelvis. In this case, there arises *anterior asynclitism, or Naegele obliquity.* If the sagittal suture is closer to the symphysis, then the posterior parietal bone goes into the inlet of the true pelvis. In this case, one can speak of *posterior asynclitism, or of Litzmann's obliquity.*

There are three degrees of posterior asynclitism:

1 degree - posterolateral inclination, with the sagittal suture being closer to the womb by 2 cm;

2 degree - posterolateral presentation, with the sagittal suture at the level of the upper margin of the womb;

3 degree - posterolateral presentation, the sagittal suture is located above the womb, is not available for examination, the ear of the fetus is to be presented into the true pelvis.

Synclytic presentation of the head is normal.

In normal childbirth, a temporary, slightly pronounced anterior asynclytism is sometimes observed, which is spontaneously replaced by a synclic presentation.

Often pronounced anterior asynclitism occurs during labor with a narrow pelvis, as a process of adaptation to its spatial features.

Pronounced anterior and posterior asynclitism is a pathological phenomenon.

Test questions and sample answers:

1. What kind of bones does the pelvis consist of?

Sample answer: two pelvic bones, the sacrum and coccyx.

2. What are the joints of the pelvis?

Sample answer: lumbar, sacroiliac, sacrococcygeal.

3. Which two parts is the obstetric pelvis divided into?

Sample answer: the greater and lesser.

4. What is the boundary between the greater and lesser pelvis?

Sample answer: the terminal line.

5. What are the sizes of the greater pelvis?

Sample answer: 25-28-31-20 cm.

6. What are the boundaries and dimensions of the inlet to the true pelvis?

Sample answer:

• the internal surface of the upper margin of the pubic symphysis, the sacrum promontory, the arcuate line on both sides (l. Arcuata);

• antero-posterior diameter -11 cm, transverse diameter - 13 cm, oblique diameter - 12 cm.

7. What are the boundaries and dimensions of the plane of the greatest pelvic dimension?

Sample answer:

• middle of the inner surface of the pubic articulation, articulation of 2-3 sacral vertebrae, projection of the midpoints of the acetabulum;

• The antero-posterior diameter is 12.5 cm, the transverse dimension is 12.5 cm.

8. What are the boundaries and dimensions of the plane of the narrow part of the true pelvis?

Sample answer:

• the lower edge of the uterus, the sacrococcygeal joint, the sciatic spine;

• antero-posterior diameter - 11 cm, transverse - 10.5 cm.

9. What are the boundaries and dimensions of the outlet plane of the lesser pelvis?

Sample answer:

• the lower margin of the pubic symphysis, the apex of the coccyx, the ischial tubercles;

• antero-posterior - 9.5 cm, transverse - 11 cm.

10. What kind of fetus is considered full-term?

Sample answer: developing in the uterus for ten obstetric months; having a weight of not less than 2600.0, height of not less than 46 cm.

11. What are the signs of the maturity of the fetus?

Sample answer:

• The chest is convex;

• umbilical ring is in the middle between the womb and the xiphoid appendage;

• Movements are active;

• loud cry;

• skin is pale pink, elastic;

• vellus hair only on the shoulders and upper back;

• hair on the head up to 2 cm;

• fingernails come to the fingertips;

• In boys, the testicles are lowered into the scrotum, in girls, large labia cover small ones.

12. What bones are the skull of the newborns consist of?

Sample answer: two frontal, two parietal, two temporal, one occipital, sphenoid, ethmoid, facial.

13. What fetal skull sutures do you know?

Sample answer: frontal, sagittal, coronal and lambdoid.

14. What fetal skull fontanelles do you know?

Sample answer: anterior and posterior.

15. Between which points is suboccipito-bregmatic diameter measured? What is its length?

Sample answer: from the suboccipital fossa to the anterior angle of the large fontanel; diameter - 9.5 cm, circumference - 32 cm.

16. Between which points is suboccipito-frontal diameter measured? What is its length?

Sample answer: from the suboccipital fossa to the border of the forehead: diameter - 10.5 cm, circumference - 33 cm.

17. Between which points is mento-vertical diameter measured? What is its length?

Sample answer: From the chin to the occiput; the diameter is 13.5 cm, the circumference is 38-42 cm.

18. Between which points is the occipito-frontal diameter measured? What is its length?

Sample answer: from the occiput to the nasal margin of the frontal bone; diameter - 12 cm, circumference - 34 cm.

19. Between which points is submentobregmatic diameter measured? What is its length?

Sample answer: between the top of the crown and the hyoid bone; 9.5 cm, the circumference - 32 cm.

20. Between which points is biparietal diameter measured? What is its length?

Sample answer: between the most distant points of parietal tubercles; diameter is 9.5 cm.

21. Between which points is bitemporal diameter measured What is its length?

Sample answer: between the most distant points of the coronal suture; diameter - 8 cm.

22. What muscles form the outer layer of the pelvic floor?

Sample answer: bulbo-cavernous, ischial-cavernous muscle, muscle, compressing the anus, surface transverse perineal muscle.

23. What muscles form the middle layer of the pelvic floor?

Sample answer: the urogenital diaphragm, the deep transverse muscle of the perineum, the external muscle that compresses the urethra.

24. What muscles form the inner layer of the pelvic floor?

Sample answer: the muscle lifting the anus (pubic-coccygeal muscle, ilio-coccygeal muscle, ischiococcygeal muscle).

25. What are the birth expulsion forces called?

Sample answer: contractions and labors.

26. What is the position of the fetus?

Sample answer: the ratio of the longitudinal axis of the fetus to the length of the uterus.

27. What is the position of the fetus?

Sample answer: the ratio of the fetal back to the right and left side of the uterus.

28. What is the type of position?

Sample answer: the ratio of the fetal back to the anterior and posterior walls of the uterus.

29. What is the presentation of the fetus?

Sample answer: the ratio of the large part of the fetus to the inlet to the true pelvis.

30. What part of the fetus is called presented?

Sample answer: part of the fetus (head, pelvic end), which lies close to the inlet of the lesser pelvis.

31. What is the insertion of the head?

Sample answer: the ratio of the sagittal suture to the sacral promontory and womb.

32. What is called the axis pelvis plane?

Sample answer: a conditional line connecting the middle of all direct dimensions.

A student should know:

1. What is childbirth? What components are involved in the birth act?
2. Anatomy of the female pelvis; bone pelvis, articulations, ligamentous apparatus.
3. Muscles of the pelvis, their physiological role in the birth act.
4. The structure of the pelvic floor, the physiological significance of the pelvic floor in the birth act.
5. Perineum, its anatomical structure and significance during childbirth.
6. Features of the anatomy of the male and female pelvis.
7. The greater pelvis, its importance in obstetrics, the recognition points of the greater pelvis.
8. Lesser pelvis, its borders, shape.

9. Axis pelvis plane.

10. The concept of "true", "anatomical", "diagonal" conjugates.

11. The concept of the maturity of the fetus.

12. Features of the structure of the skull of the newborn.

13. Dimensions of the head of the term fetus, shoulder and pelvic girdle.

14. The concept of the configuration of the head, its meaning in the birth act.

15. Obstetric terminology: position of the fetus, position type, fetal presentation, anterior part, insertion of the fetal head.

A student should have the following skills:

1. to determine the position of the fetus on the model and in the pregnant woman, its position, the type of position, the presenting part.

2. to identify pelvic recognition points in the bone pelvis, on the model and in the pregnant woman.

3. to measure the external dimensions of the pelvis.

4. to measure the diagonal conjugate.

5. to determine the identification points on the head of the fetus.

6. to determine on the doll a small and large fontanel, a swept head seam.

7. to determine with the mnemotechnical technique on the model the direction of the arrow-shaped seam.

8. to measure the frontal-occipital size of the head on the doll and the newborn.

9. to measure the length and weight of a newborn.

10. to identify and evaluate the signs of the maturity of the fetus.

Questions for self-study work:

1. What is childbirth? What components are involved in the birth act?

2. Anatomy of the female pelvis; bone pelvis, articulations, ligamentous apparatus.

3. Muscles of the pelvis, their physiological role in the birth act.

4. The structure of the pelvic floor, the physiological significance of the pelvic floor in the birth act.

5. Perineum, its anatomical structure and significance during childbirth.

6. Features of the anatomy of the male and female pelvis.

7. The greater pelvis, its importance in obstetrics, the recognition points of the greater pelvis.

8. Lesser pelvis, its borders, shape.

9. Axis of the pelvis.

10. The concept of "true", "anatomical", "diagonal" conjugates.

11. The concept of the maturity of the fetus.

12. Features of the structure of the skull of the newborn.

13. Dimensions of the head of the term fetus, shoulder and pelvic girdle.

14. The concept of the configuration of the head, its meaning in the birth act.

15. Obstetric terminology: position of the fetus, position type, fetal presentation, anterior part, insertion of the fetal head.

Topic 3
BIOMECHANISM OF LABOR WITH ANTERIOR AND POSTERIOR TYPES OF FETAL OCCIPUT PRESENTATION

The objective of the class: to familiarize students with the biomechanism of labor in case of the anterior and posterior types of the occipital presentation.

A student should know: what is the biomechanism of childbirth, the moments of biomechanisms of labor in the anterior and posterior types of occipital presentation.

The student should have the following skills: to demonstrate on the model pelvis and the dummy all the moments of the biomechanisms of labor in the anterior and posterior forms of the occipital presentation, determine the position, lie, type and presentation of the fetus using Leopold's methods, on the dummy, in which plane of the pelvis is the descent of the fetal head.

Place: classroom, maternity room.

Visual aids: dummies, pelves, models, slides, tables:

1. Landmark points of the pelvis, the fetal head;
2. Pelvic axis;
3. Various moments of the biomechanism of labor in the anterior and posterior fetal presentation;
4. Cutting and crowning of the head.

Contents of the class:

The biomechanism of childbirth is a complex whole of all movements that the fetus performs when passing through the maternal birth canal.

The fetus performs such movements as flexion, rotation and extension in the course of its passage through the birth canal.

Occipital presentation refers to the presentation, when the head of the fetus is in a flexed state and the lowest leading part of the head is the occiput. Labor with the occipital presentation is about 96% of all births. In the occipital presentation, there may be anterior (A) and posterior type (B) (fig. 3.1).

The anterior type is often observed in the first position, the posterior type in the second position.

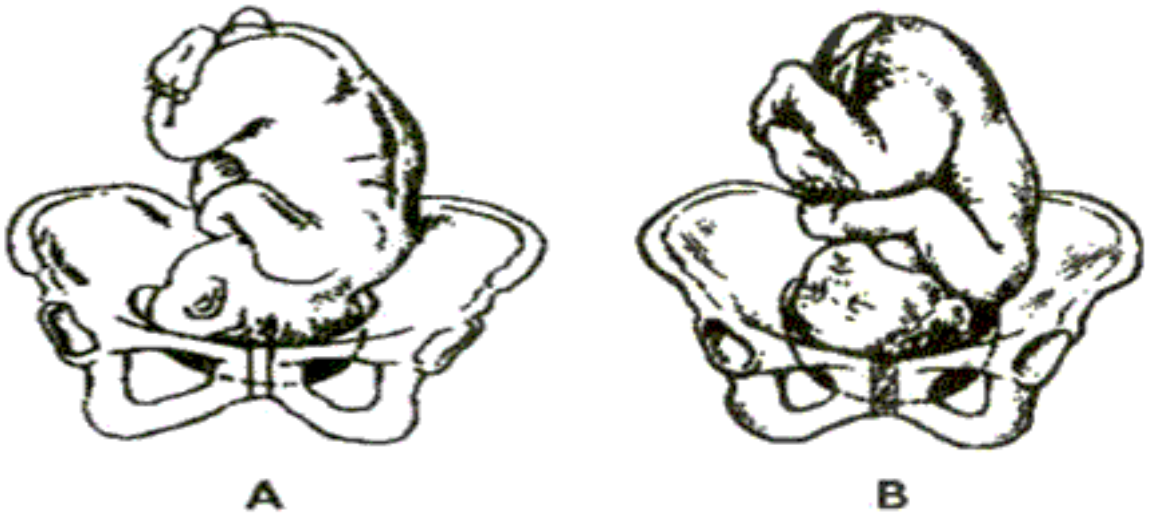


Fig. 3.1.
A - Anterior type of occiput presentation; B - Posterior type of occiput presentation

BIOMECHANISM OF LABOR WITH ANTERIOR TYPE OF FETAL OCCIPUT PRESENTATION

There are four moments of the labor mechanism.

The first moment (cardinal movement) is the flexion of the head (flexio capitis) (fig. 3.2).

With the onset of regular labor, the head enters the pelvis so that the sagittal suture is located in the transverse or slightly oblique pelvic diameter. The pressure of the uterus acts from above on the pelvic end, and through it on the spine and the head of the fetus. The spine is connected with the head not in the center, but closer to the occiput; in this connection, a lever is formed, at the short end there is the occiput, at the long one is the forehead. The power of intrauterine and intra-abdominal pressure is transmitted through the spine primarily to the occiput. The occiput descends, the chin approaches the rib cage, the posterior fontanel is located below the anterior fontanel. Subsequently, the area of the posterior fontanel all the time moves along the axis of the pelvis, it is present first from the vulvar cleft.

The posterior fontanel in the anterior type of the occipital presentation is the leading point. **The leading point** is the one that is on the presenting part, it is the first that descends in the inlet of the pelvis, and the first is shown from the vulvar cleft.

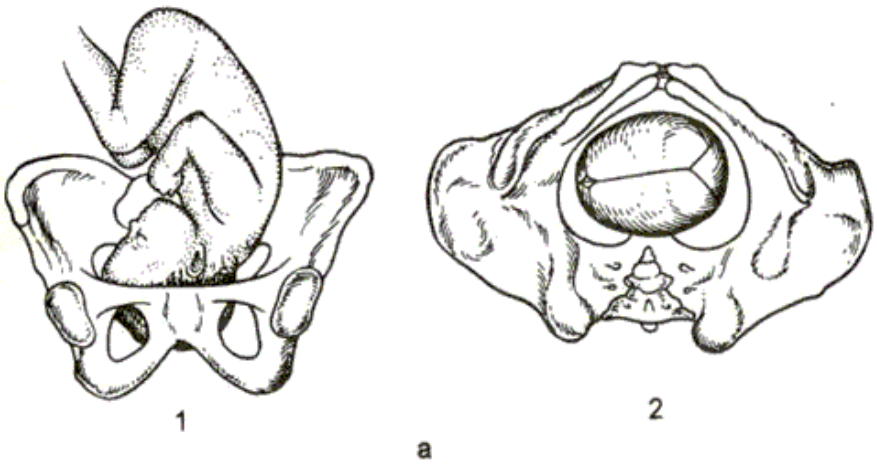


Fig. 3.2. The first moment of labor biomechanism

The second moment is the internal rotation of the head (correct, fig. 3.3).

The head makes forward movements and simultaneously rotates around the longitudinal axis. At the same time, the occiput (and posterior fontanel) is directed anteriorly, and the forehead and (the anterior fontanel) are directed posteriorly. The sagittal suture, which was in the transverse diameter of the inlet of the pelvis, gradually changes position. In the outlet of the pelvis, the sagittal suture is set in the anteroposterior diameter. This internal rotation of the head at this point ends, and the descent posterior fontanel faces directly the symphysis.

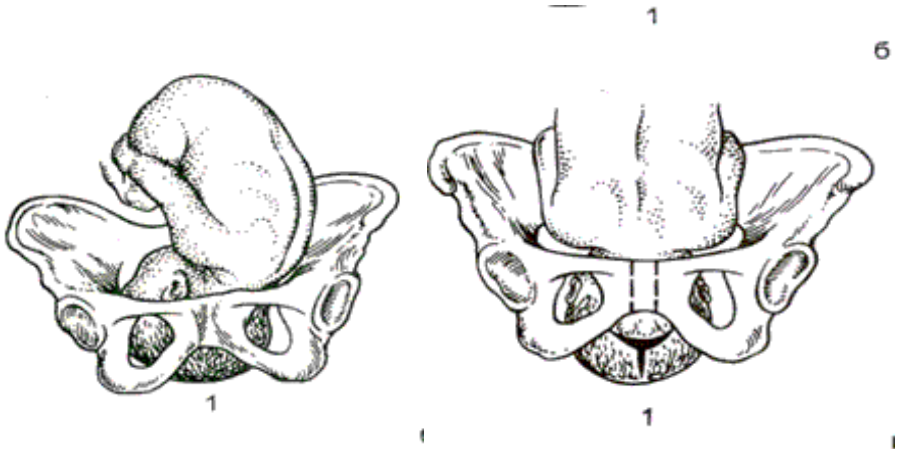


Fig. 3.3. The second moment of labor biomechanism

The third moment is the extension of the head (fig. 3.4).

The rotation around the transverse axis. When the flexed head reaches the pelvic outlet, it meets the resistance of the pelvic floor muscles. Contractions of the uterus and abdominal muscles exert a downward force on the fetus. The muscles of the pelvic floor are resistant to the forward movement of the head

and help to deflect it anteriorly (upwards). Under the influence of these two forces, the head becomes unbent, which is facilitated by the shape of the birth canal. Extension of the head occurs after the area of the suboccipital fossa closely approaches the pubic arch.

Around this point of support the head is extended. When extending , the parietal region, forehead, face, chin, successively emerge from the vulvar cleft, the whole head is born. In the anterior occiput presentation, the head negotiates the vulva with a plane passing through the **suboccipito-bregmatic diameter** (32 cm circumference).

The point of support, around which the rotation of the head occurs during presentation, is called the fixation point (or point of rotation) - hypomocholion. In the anterior occiput presentation, the fixation point is formed between the area of the suboccipital fossa and the lower margin of the symphysis.

Fig. 3.4. The third moment of the biomechanism of labor

The fourth moment is the internal rotation of the shoulders and the external turn of the fetal head (fig. 3.5).

The head after birth turns to face the right or left thigh of the mother, depending on the position. In the first position the face turns to the right thigh of the mother, in the second - to the left one. The external turn of the head depends on the internal rotation of the trunk. The shoulders with their transverse dimension enter the transverse or slightly oblique pelvic diameter. In the pelvic cavity, the rotation of the shoulders begins and they pass into the oblique diameter. On the pelvic floor, the internal rotation of the shoulders stops, they are set in the anteroposterior diameter of the pelvic outlet. The rotation of the shoulders is transferred to the head, when they are set in the anteroposterior

diameter of the outlet, the face turns to the mother's thigh. After the birth of the shoulder girdle, the remaining parts of the fetus are expelled. All these moments of the labor mechanism can be determined on the vaginal examination of the parturient woman. With sufficient opening of the pharynx and especially after opening (a fetal bladder, it is usually easy to identify the landmark points: sutures and fontanels. According to the location of the sagittal suture, the posterior and anterior fontanels, one can judge the mechanism of labor.

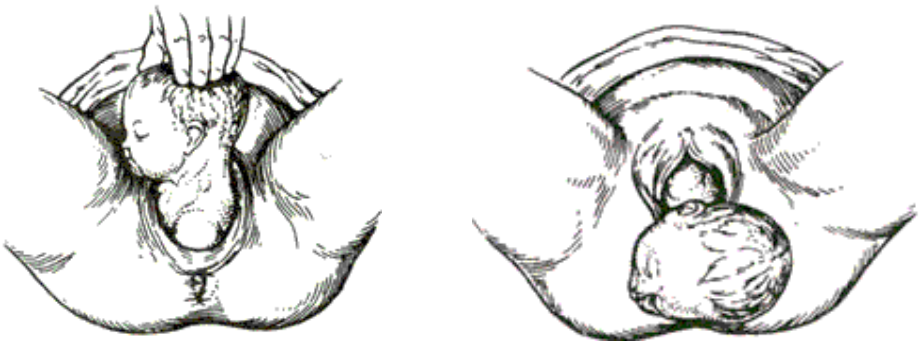


Fig. 3.5. The fourth moment of the biomechanism of labor

BIOMECHANISM OF LABOR IN OCCIPUT POSTERIOR PRESENTATION

The delivery in occiput posterior presentation is called the biomechanism variant, in which the birth of the fetal head occurs when the back of the baby's head is against the sacrum. The causes for the occiput posterior fetal position may be the changes in the shape and capacity of the lesser pelvis, functional infertility of the uterine muscles, features of the shape of the fetal head, premature or dead fetus.

The first moment is the flexion of the head (flexio capitis) (fig. 3.6).

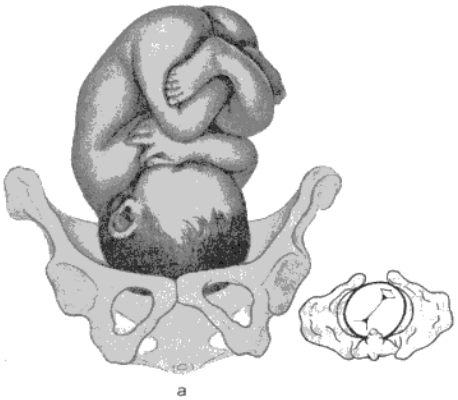


Fig. 3.6. The first moment of the labor biomechanism

Posterior fontanel becomes the front point on the head that goes first i.e. the leading point. In the pelvic cavity, during rotation, the middle part between the posterior and anterior fontanel becomes the leading point.

The second moment is an internal wrong spin of the head (fig. 3.7).

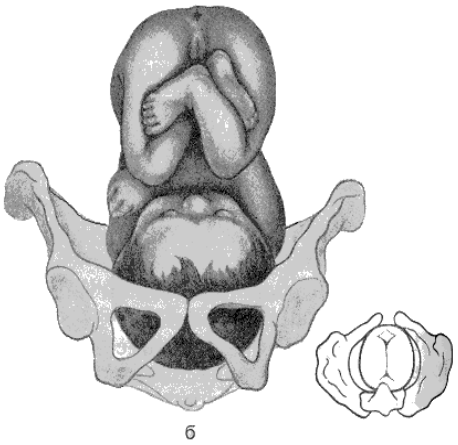


Fig. 3.7. The second moment of the biomechanism of labor

The flexed head descends into the pelvis, at the same time it turns with the occiput towards the back; The sagittal suture in the pelvic cavity passes into the oblique diameter. In the outlet of the pelvis, the sagittal suture is in the anteroposterior diameter (the turn is completed). After the end of the turn, the posterior fontanel is directed to the sacrum, the anterior fontanel - to the symphysis.

The third moment is the further (maximum) flexion of the head (fig. 3.8).

Fig. 3.8. The third moment of the biomechanism of labor

The border of the scalp rests against the pubic arch (first fixation point), and the head is strongly flexed around it. During the additional flexion of the head, the parietal eminences and the occipital protuberance are present.

The fourth moment – the extension of the head (fig. 3.9).

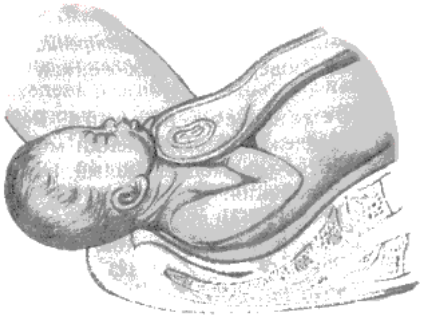


Fig. 3.9. The fourth moment of the biomechanism of labor

The head rests against the sacrococcygeal symphysis in the area of the suboccipital fossa (the second fixation point) and makes an extension. The head is present by a circle corresponding to an average oblique size (33 cm).

The fifth moment - the external rotation (turn) of the head, the internal turn of the shoulders occur (fig. 3.10).

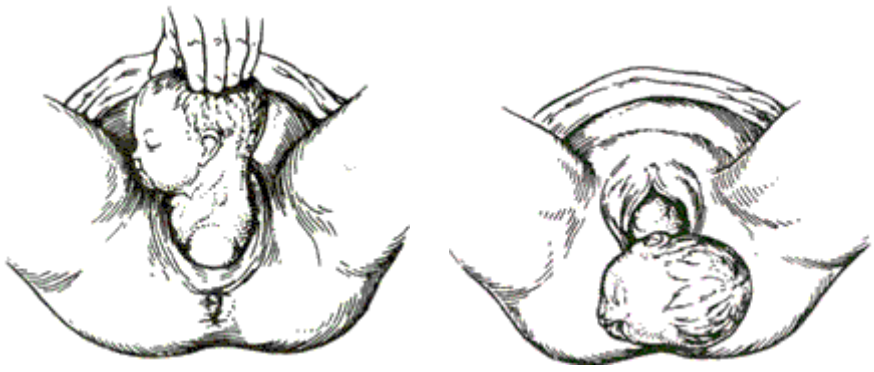


Fig. 3.10. The fifth moment of the biomechanism of labor

It occurs like in the anterior form of the occiput presentation. In the posterior occiput presentation, the movement of the head along the birth canals is difficult, the period of expulsion is longer than in the anterior occiput presentation. The additional flexion of the head occurs with strong and prolonged uterine activity, while the woman giving birth makes a lot of effort,

the pelvic floor undergoes a more significant stretching, there are often ruptures of the perineum.

In connection with a long period of expulsion and the difficult advance of the head through the birth canal, the fetal respiratory metabolism distress often occurs. With sufficient opening of the pharynx and especially after opening (a fetal bladder, it is usually easy to identify the landmark points: sutures and fontanels. According to the location of the sagittal suture, the posterior and anterior fontanels, one can identify the mechanism of labor.

Test questions and sample answers:

1. Give a definition of the concept of "biomechanism of labor."

Sample answer: A complex of movements performed by the fetus during passage through the maternal birth canal.

2. What are the moments of the biomechanism of labor in the anterior occipital presentation of the fetus?

Sample answer: Head flexion, internal head rotation, extension of the head, internal rotation of the shoulders, external rotation of the head.

3. What are the moments of the biomechanism of labor in the posterior occiput presentation?

Sample answer: Head flexion, internal head rotation, additional flexion of the head, extension of the head, internal rotation of the shoulders, external rotation of the head.

4. Where does the first moment of the biomechanism of labor (head flexion) occur in the anterior occiput presentation of the fetus?

Sample answer: In the plane of the pelvic inlet.

5. How to diagnose the fetal head flexion?

Sample answer: On vaginal examination: the posterior fontanel is located below the anterior fontanel.

6. What movements does the fetal head take in the third moment of the biomechanism of labor in the anterior occiput presentation?

Sample answer: Progressive forward movement and extension.

7. What is the leading point?

Sample answer: The lowest located part of the head, passing the first along the axis of the pelvis.

8. What is the leading point in the anterior and posterior occiput presentation of the fetus?

Sample answer: Posterior fontanel, the middle part between the anterior and posterior fontanels.

9. What fixation points are there in the posterior type of the occiput presentation of the fetus?

Sample answer: Suboccipital fossa.

10. What fixation points are given in the form of the occipital presentation of the fetus?

Sample answer: Suboccipital fossa, the border of the forehead.

11. What part of the head does the fetal head penetrate in case of the anterior type of the occiput presentation of the fetus?

Sample answer: the circumference of suboccipitobregmatic diameter equal to 32 cm.

12. What part of the head penetrates in the posterior type of the occiput presentation?

Sample answer: The circumference of the average oblique size is 33 cm.

13. Which moment of the biomechanism of labor does the crowning of the head correspond to?

Sample answer: The third moment is the extension of the head.

A student should have the following skills:

1. to conduct vaginal examination in labor.
2. to determine all the landmark points of the lesser pelvis.
3. to identify the posterior, anterior fontanels on the fetal head.
4. to identify the sagittal suture.

5. to determine the height of the head of the fetus according to the data of external and vaginal examinations.

6. to describe the data of the vaginal examination.

Test questions and tasks for self-study:

1. What is the biomechanism of labor?

2. What is the fixation point (hypomochlion)?

3. What position does the fetal head take in relation to the lesser pelvis before the onset of labor?

4. What is the leading point in the anterior type of the occipital presentation of the fetus?

5. What cardinal movements does fetal head perform during the childbirth in the anterior type of occipital presentation?

6. What factors ensure the flexion of the fetal head?

7. What factors contribute to the internal rotation of the fetal head?

8. In what plane of the pelvis does the internal rotation of the head end?

9. What position does the sagittal suture take before the inlet of the pelvis, in the pelvic cavity, on the pelvic floor?

10. What factors ensure the extension of the fetal head?

11. What is the fixation point in the anterior type of the occiput presentation?

12. What is the circumference of the head of the fetus erupt at the back of the occipital a presentation of the fetus?

13. Which side is the occiput of the fetus directed to in the fourth moment of the labor biomechanism?

14. What are the cardinal movements of the biomechanism of labor in the anterior type of the occiput presentation?

15. What head circumference of the fetus is present first in the posterior type of the occiput presentation?

16. What is the leading point and fixation points in the anterior type of the occiput presentation?

17. What are the characteristics of the course of labor in the posterior type of the occiput presentation?

18. What position can the fetal head take in relation to the planes of the lesser pelvis?

Topic 4
DIAGNOSTICS OF PREGNANCY IN EARLY AND LATE TERMS. METHODS OF OBSTETRIC EXAMINATION

Objective of the class: To get acquainted with the biochemical, physiological and anatomical changes accompanying pregnancy. To learn to characterize dubious, probable and reliable signs of pregnancy, used to diagnose pregnancy in the early and late periods. To learn to collect obstetric case history and produce general and special obstetric examination of a woman for diagnosis and pregnancy management.

Place: classroom, the department of pregnancy pathology, the prenatal diagnostics department, delivery room.

Visual aids: tables, models, slides that demonstrate:

1) anatomical changes in a woman during pregnancy;
2) the fundal height at various stages of pregnancy;
3) signs of Genter, Piskachek, Snegirev, a Horvits-Gegar symptom;
4) Leopold techniques;
5) measurement of the external dimensions of the greater pelvis;
6) measurement of the diagonal conjugate.

Contents of the class:

Early diagnosis of pregnancy is very important not only for obstetricians and gynecologists, but also for doctors of various specialties, since the biochemical, hormonal, physiological and anatomical changes accompanying pregnancy can significantly affect the course of extragenital diseases.

Diagnosis of pregnancy, especially early terms, sometimes presents significant difficulties, since some endocrine diseases, stresses, and taking medication can imitate the state of pregnancy. Further, difficulties arise, as a rule, when determining the duration of pregnancy.

The signs of pregnancy, described in the classic textbooks on obstetrics, now lost their significance to some extent with the widespread introduction of ultrasonic diagnostics.

The signs of pregnancy, based on subjective or objective data, are divided into dubious, probable and reliable.

Dubious signs include the manifestation of general changes associated with pregnancy; various subjective sensations:

• nausea, vomiting, especially in the morning, changes in appetite, as well as food preferences;

• intolerance to some odors (perfume, tobacco smoke, etc.);

• dysfunction of the nervous system: malaise, irritability, drowsiness, mood instability, dizziness, etc .;

• increased frequency of urination;

• breast pressure;

• skin pigmentation on the face, along the white abdominal line, in the nipple region;

• the emergence of pregnancy "bands" on the skin of the abdomen, mammary glands and thighs;

• increased abdomen volume.

Probable signs of pregnancy are determined mainly by objective changes in the sexual organs, beginning with the first trimester:

• termination of menstruation (amenorrhea) in a healthy woman of the reproductive age;

• the colostrums emergence in nulliparous when the nipples are pressed on;

• cyanosis of the mucous membrane of the vagina and cervix;

• enlargement of the uterus, change of its shape and consistency.

Detection of cyanosis of the vagina and cervix, as well as changes in the size, shape and consistency of the uterus is possible in the course of a special gynecological examination: examination of the external genitalia and vaginal orifice, examination of the walls of the vagina and cervix using specula, as well as with a vaginal-abdominal examination by both hands. Among the signs indicating a change in the shape and consistency of the uterus in connection with pregnancy, the most important are the following:

•***Enlargement of the uterus*** is noticeable already at 5-6 weeks of pregnancy. The uterus becomes round, enlarged, soft, towards the end of the 8^{th} week. The size of the uterus corresponds to the size of the goose egg, at the end of the 12^{th} week. The bottom of the uterus is at the symphysis level or somewhat higher.

•***Horvits-Hegar's sign.*** The consistency of the pregnant uterus is mild, and the softening is especially pronounced in the isthmus region. The fingers of both hands in examination by both hands can meet in the isthmus region almost without any resistance (fig. 4.1).

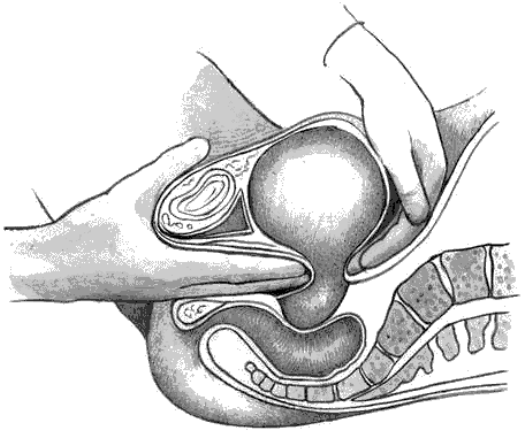


Fig. 4.1. Pregnancy sign of Horvits-Hegar

This sign is very typical of early terms of pregnancy and is clearly determined after 6-8 weeks from the onset of the last menstruation.

•***Sign of Snegirev***. The variability of consistency is characteristic of the pregnant uterus. The softened pregnant uterus during bimanual examination under the influence of mechanical irritation becomes compact and reduced in size. After the cessation of irritation the uterus again takes a soft consistency.

•***Sign of Piskacek.*** Early pregnancy is characterized by the asymmetry of the uterus, caused by a domed protrusion of the right or left angle, which corresponds to the place of implantation of the fetal egg. As the fetal egg grows, this asymmetry gradually disappears (fig. 4.2).

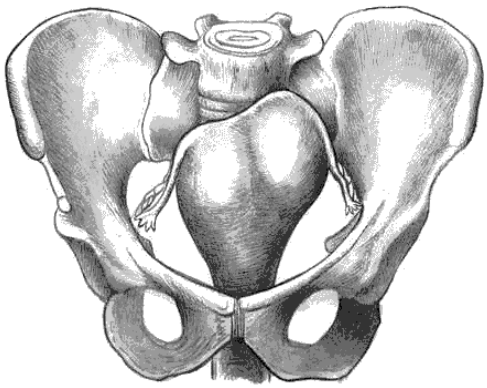


Fig. 4.2. Piskacek's sign of pregnancy

•***Gauss and Gubarev's sign.*** shows a marked mobility of the uterus in early weeks of pregnancy which is associated with a significant softening of the uterine isthmus.

•***Genter's sign.*** Due to the softening of the isthmus in the early stages of pregnancy, uterine flexion occurs anteriorly and a crest-like thickening on the anterior surface of the uterus along the midline. However, this thickening is not always determined (fig. 4.3).

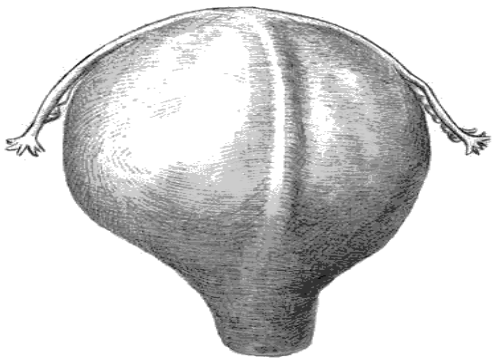


Fig. 4.3. Genter's sign of pregnancy

•**Chadwick's sign.** In the first 6-8 weeks of gestation cyanosis of the cervix is noted.

Probable signs of pregnancy include delay in menstruation and a positive result of immunological tests for pregnancy. In practice, the determination of the level of the b-subunit of chorionic gonadotropin in the blood serum is widely used, which makes it possible to establish pregnancy several days after the implantation of the fetal egg. Evaluation of the b-subunit level of chorionic gonadotropin in dynamics allows the clinician to determine the localization and prospects for early pregnancy.

Human chorionic gonadotropin (hCG), a hormone produced by chorion and excreted in the urine of a woman - is a biological and serological marker of pregnancy. The concentration of hCG increases with the increase in gestation, both in the blood and in the urine of a woman.

This hormone can be determined in several ways. Due to their high specificity and sensitivity, preferences are given to the ELISA method of HCG content in the blood (determines the hCG 5-7 days after implantation). Express methods are also used to test pregnancy at home (diagnose pregnancy 1-2 weeks after implantation), based on a change in the color of the strip after a positive reaction after immersing it in the morning portion of urine. The radioimmune

method of determining hCG allows one to diagnose the onset of pregnancy before the delay of another menstruation.

High concentrations of gonadotropin can occur in certain pathological conditions (hydatidiform mole; chorionepithelioma, placental polyp, ovarian tumors), small concentrations (breast, lung cancer). Therefore, these reactions should be taken into account in the totality of the signs obtained as a result of the examination of the patient.

For potentially viable uterine pregnancy until 6-7 weeks of gestation, the following rules apply:

• the average doubling time for hCG is 1.4-2.1 days;

• in 85% of patients every 48 hours the hCG level increases by 66% or more, in 15% - by 53-66% (more than 48 hours the slowest growth of hCG is registered by 53%).

Uterine pregnancy is usually visualized by ultrasonic examination, when the fetal egg is greater than or equal to 3 mm. This corresponds to the value of hCG:

•1500-2000 IU/l for transvaginal scanning;

•or approximately 6500 IU/l - for transabdominal scans, which should be used only if transvaginal scanning is not possible.

The most reliable information for diagnosing pregnancy is obtained with the help of ultrasound. With transabdominal scanning, pregnancy can be established from 4-5 weeks, and with transvaginal echography - 1-1.5 weeks earlier. In early terms, pregnancy is established on the basis of the fetal egg, yolk sac, embryo and its cardiac contractions in the uterus cavity, in later terms - due to the visualization of the fetus (or in the case of multiple pregnancies). Cardiac fetal activity with ultrasonic examination can be detected from 5-6 weeks of pregnancy, motor activity of the embryo from 7-8 weeks.

In the second half of pregnancy there are signs that testify to the presence of the fetus in the uterine cavity - ***these are reliable or indubitable signs of pregnancy:***

1. Palpable parts of the fetus. In the second half of pregnancy, when palpating the abdomen, the head, back and small parts (limbs) of the fetus are determined; The longer the gestation period, the better the fetal parts are probed.

2. Clearly audible heart tones of the fetus. With the help of an obstetric stethoscope, the fetal heart sounds are heard from the beginning of the second

half of pregnancy in the form of rhythmic beats, repeated 120-140 times per minute. Sometimes it is possible to catch the fetal heartbeat from 18-19 weeks of pregnancy. Registration of fetal heartbeats is possible at an earlier time using echocardiography (48 days after the first day of the last menstruation) and echography (from 5-6 weeks of gestation).

3. Fetal movements felt by the doctor during examination of a pregnant woman are usually determined in the second half of pregnancy. The pregnant women themselves feel the movement of the fetus – a primiparous woman from the 20^{th} week, and a multiparous woman from the 18^{th} week, but these feelings do not relate to reliable signs, since they can be erroneous. A woman can take the peristalsis of the intestine as the movement of the fetus.

Recognition of pregnancy requires a comprehensive examination of the patient: only after careful collecting anamnesis, after listening to subjective complaints, performing inspection and palpation of the abdomen, mammary glands, examination of external and internal genital organs, the doctor can diagnose pregnancy on the basis of the total amount of possible and probable signs. In addition, in doubtful cases, pregnancy is clarified with an ultrasonic examination (a reliable sign). The diagnosis of pregnancy is accurate even if there is only one reliable sign.

Examination of a pregnant woman

Examination of a pregnant woman begins with a medical history.

Anamnesis data is collected according to the following plan:

1. Passport data: last name, first name, middle name, age of the pregnant woman and her husband, place of work and profession, place of residence.

The question of the age is important because very young (up to 18 years) and "mature" (30 years and older) primiparous women have complications of pregnancy, children are frequently born with developmental abnormalities. Working conditions (occupational hazards) and life are of particular importance for maintaining health of the pregnant woman and correct development of the intrauterine *fetus.*

2. Complaints of the pregnant woman. It is necessary to identify from the total number of complaints those that are peculiar to the physiological course of pregnancy and those that are indicative of the occurrence of complications: bleeding from the genital tract, pain in the lower abdomen and in the lower back, dysuric manifestations and others.

3. Heredity and previous diseases. Hereditary diseases are of interest because they can have an adverse effect on the fetal development.

It is important to get information about all previous diseases. For example, rickets in childhood can lead to the deformation of the pelvic bones; chronic intoxications at the age of puberty (chronic tonsillitis, tuberculosis, rheumatism) often cause retardation in physical and sexual development and can cause sexual infantilism, the formation of an abnormal pelvis; diseases of the cardiovascular system, lungs, liver, kidneys can affect the course of pregnancy and childbirth, serve as indications for abortion.

4. Menstrual function. When interviewing a patient one should find out about the age of menarche, the time of the formation of the menstrual cycle, its duration, the amount of blood loss, the presence of pain, the date of the last menstruation. Menstrual function characterizes the condition of the sexual organs and the entire body of a woman. Late emergence of menarche, the prolonged development of the menstrual cycle is characteristic of general and sexual infantilism; menstrual dysfunction after the onset of sexual activity, childbirth and abortion is most often a sequence of an inflammatory process of the female genitalia, which can affect the course of pregnancy, childbirth and the postpartum period.

5. Sexual function. When interviewing a patient it is important to find out about the age of the onset of sexual activity, marriage in succession, intermarriage or not, the degree of kinship. Children from intermarriages often have developmental anomalies.

6. The age and health of the husband, the presence of bad habits.

7. Genital function. Find out the number of pregnancies and the date of each of them, the course of previous pregnancies, childbirth, abortion, the weight of the children born.

The normal course of the previous birth testifies to the good health of the woman and the absence of abnormal birth canal.

Pathological births in the past (burdened obstetric anamnesis) give grounds to expect the occurrence of complications in this pregnancy.

One should find out about the time interval from the onset of sexual activity to the onset of the first pregnancy: a long period of infertility may indicate infantilism.

In the foreign literature, the following concepts are distinguished.

- *Nulligravida* is a woman who is not currently pregnant and does not have a pregnancy in the anamnesis.

- *Gravida* is a woman who is currently pregnant or has had a pregnancy before, regardless of its outcome. At the first pregnancy a woman is considered first-pregnancy (primigravida), and in the next pregnancies - a re-pregnant (multigravida).

- *Nullipara* - a woman who never had a pregnancy that reached the term of a viable fetus; previously she might or may not have had a pregnancy that ended in an earlier abortion.

- *Primipara* - a woman who had one pregnancy before the birth of a viable fetus.

- *Multipara* - a woman who has a history of several pregnancies, full term to the term of a viable fetus (22 weeks gestation, the weight of the fetus - 500 g).

After getting acquainted with the medical history of the patients one should proceed to an objective examination, which begins with the inspection.

Examination of a pregnant woman. On examination, attention is paid to the height, weight, body build, skin and visible mucous membranes, the condition of the mammary glands, the size and shape of the abdomen. The ratio of weight and height is taken into consideration to assess the presence and extent of obesity or cachexy, which are signs of metabolic, endocrine and other diseases, by calculating the body mass index (BMI): BMI = weight of the pregnant (kg): height (m) 2. The norm of the BMI is from 18 to 25 kg/m^2.

With a low height (150 cm and below), narrowing of the pelvis, underdevelopment of the uterus are often observed. Tall women have a wide pelvis, a male-type pelvis, a deformity of the spine, lower limbs, and ankylosis of the joints indicate the possibility of changing the form and the volume of the pelvis. The pigmentation of the face, the white line of the abdomen, the nipples and the nipple circles allows one to think about the presence of pregnancy. Pale skin and visible mucous membranes, cyanosis of the lips, ochrodermia of the skin and sclera, edema are signs of a number of serious somatic diseases and complications of pregnancy.

Investigation of internal organs. After general examination, the cardiovascular system, lungs, nervous system, digestive organs, and urinary system are examined according to generally accepted methods.

It is necessary to measure blood pressure on both hands to identify vegetative-vascular asymmetry, which is an early sign of the development of late gestosis in pregnant women.

Obstetrical examination includes determining the size of the uterus, examining the pelvis, assessing the position of the fetus in the uterus on the basis of special obstetric techniques. Methods of obstetric examination depend on the period of pregnancy.

In the first trimester of pregnancy, the size of the uterus is determined with *bimanual vaginal-abdominal examination*, which begins with the inspection of the external genitalia. The examination is carried out in sterile rubber gloves on a gynecological chair. The woman lies on her back, her legs are bent in the hip and knee joints and apart; When examining on a bed under the rump, a roller is placed.

The external genitalia are treated with an antiseptic solution. Large and small labia are separated with fingers I and II of the left arm and the external genitalia (vulva), the mucous membrane of the vaginal opening, the external opening of the urethra, the excretory ducts of the large glands of the vulvar vestibule and the perineum are examined.

For the purpose of inspecting the walls of the vagina and the cervix, *the examination is performed with the use of specula.* This determines the cyanosis due to pregnancy, and various pathological changes in the disease of the vagina and cervix. Vaginal specula (fig. 4.4) can be bivalved, spoon-like, metallic or plastic. The folding speculum is inserted up to the vaginal vault in a closed form, then the valves are opened, and the cervix becomes accessible for inspection. The walls of the vagina are examined with a gradual removal of the speculum from the vagina.

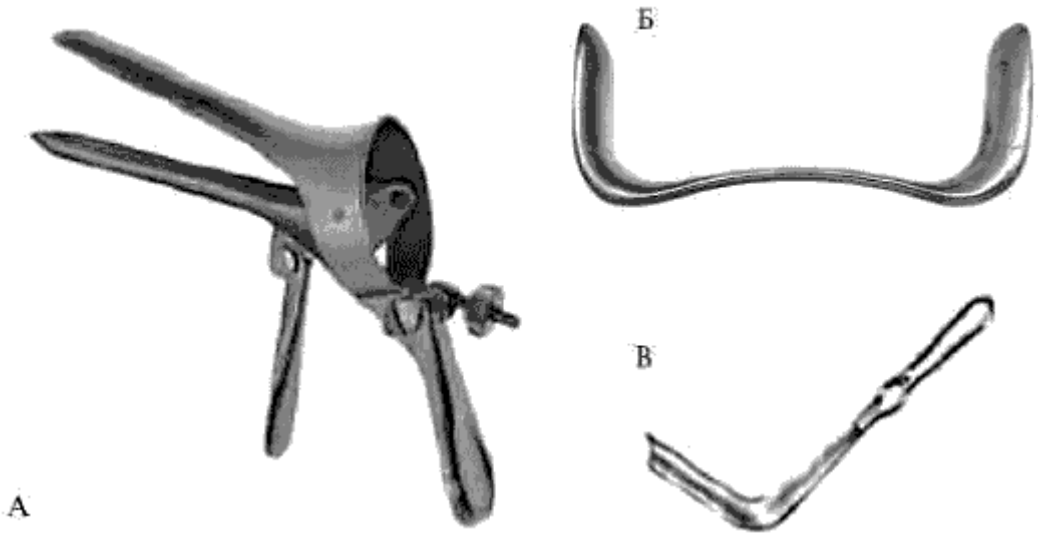
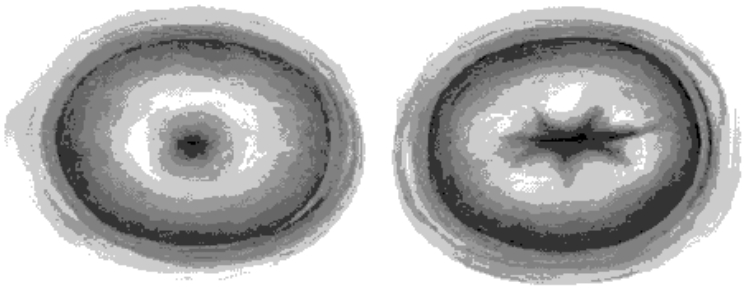


Fig. 4.4. Vaginal specula (А - bivalved, Б - spoon-like (Sims), В - lift)

In a vaginal (finger) examination, separate large and small labia with the fingers of the left hand; the fingers of the right hand (II and III) are inserted into the vagina, finger I is moved upward, IV and V are pressed to the palm and rest against the crotch. This determines the state of the muscles of the pelvic floor, the walls of the vagina (folding, extensibility, loosening), vaults of the vagina, the cervix (length, shape, consistency) and the external orifice of the cervix (closed, open, round or slit).

An important criterion of the previous deliveries is the shape of the external orifice of the cervix, which in the parous women has the shape of a longitudinal slit, and in nulliparous - round or dotted (fig. 4.5). Women who give birth may have cicatricial changes after ruptures of the cervix, vagina and perineum.



А Б

Fig. 4.5. The shape of the external orifice of the uterus cervix in the nulliparous (А) and the parous woman (Б)

After palpation of the cervix, the vaginal-abdominal examination with both hands can be initiated (fig. 4.6). With fingers of the left hand you can gently push on the abdominal wall towards the pelvic cavity towards the fingers of the right hand, located in the anterior vaginal vault. Bringing together the fingers of both hands while investigating, palpate the body of the uterus and its position is determined as well as its shape, size and consistency. After this, you can begin to examine the fallopian tubes and ovaries, gradually moving the fingers of both hands from the corner of the uterus to the lateral walls of the pelvis. To determine the capacity and shape of the pelvis, one can examine the inner surface of the pelvic bones, the hollow of the sacrum, lateral walls of the pelvis and the symphysis.

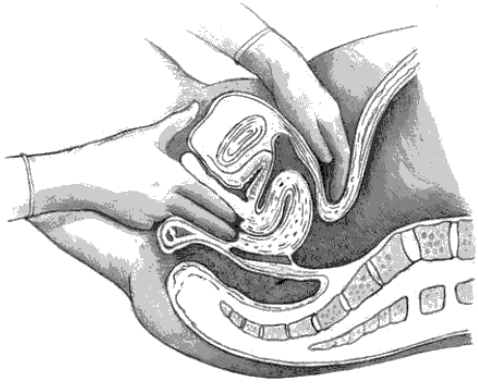


Fig. 4.6. Vaginal-abdominal examination with both hands

When examining a pregnant woman in the II-III trimesters, it is required to measure the abdominal circumference at the level of the navel (fig. 4.7) and the fundal height (fig. 4.8) with a centimeter tape when the woman lies on her back. The fundal height above the pubic articulation can also be determined with the pelvimeter. These measurements are made on each round to a pregnant woman and the findings are compared with gestation standards.

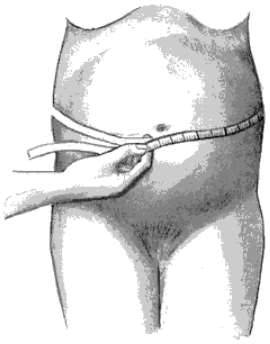


Fig. 4.7. Measurement of the abdominal circumference

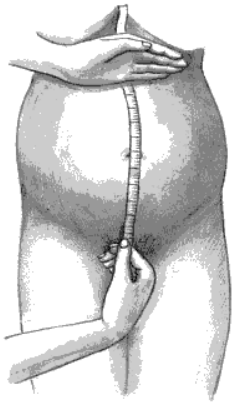


Fig. 4.8. Measurement of the fundal height

Normally, by the end of a pregnancy, the abdominal circumference does not exceed 100 cm, and the fundal height is 35-36 cm. The abdominal circumference is more than 100 cm. It is usually observed in polyhydramnios, multiple fetuses, large fetuses, transverse fetal position and obesity. Knowing the height, the weight of the pregnant woman, by measuring the abdominal circumference and the fundal height, you can approximately calculate the weight of the fetus:

1. Lankowitz formula: X = (growth + weight + Abd circum. + VDM) × 10

2. Jordan's formula, X = Abd. circum. × VDM

Determining the size of the pelvis is extremely important, as reducing or increasing it can lead to a significant disruption in the course of labor. The size of the lesser pelvis is of the greatest significance during delivery, which is assessed by measuring certain dimensions of the greater pelvis with the help of a special instrument - the obstetric pelvimeter (fig. 4.9).

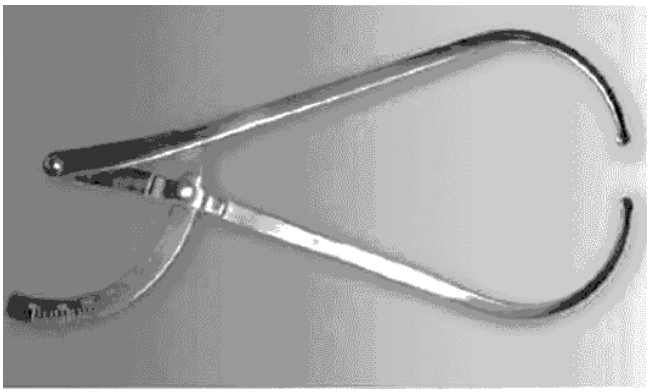


Fig. 4.9. Obstetric pelvimeter

The pelvimeter has a form of a compass provided with the scale on which centimeter and half-centimeter markings are scribed. At the ends of the branches of the pelvimeter there are buttons that are applied to the prominent points of the greater pelvis, somewhat squeezing the subcutaneous fatty tissue.

Pelvimetry. Measurement of the pelvis is carried out in the position of a woman on her back with her naked stomach and legs together. The doctor stands to the right of the pregnant woman facing her. The branches of the pelvimeter are taken in such a way that the I and II fingers hold the buttons. The scale with the markings faces upward. With index fingers grope the points, the distance between which is to be measured, pressing them to the buttons of the extended branches of the pelvimeter.

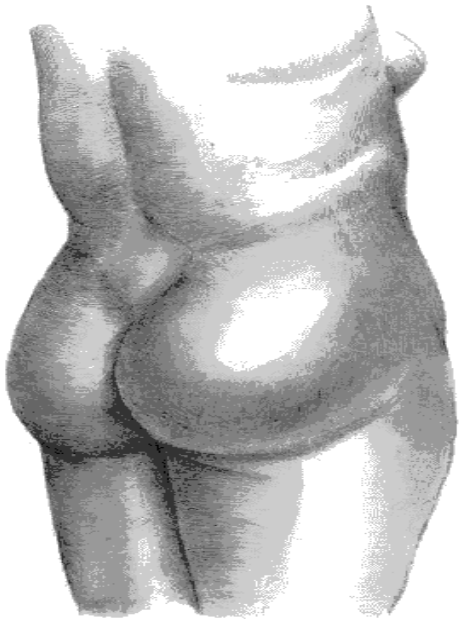


Fig. 4.10. Michaelis rhombus

On the scale, you can note the magnitude of the corresponding size. You can determine the transverse diameter of the pelvis - *distantia spinarum, distantia cristarun, distantia trochanterica* and the straight dimension - *conjugata externa.*

The pelvic examination is produced by inspection, palpation and measurement. On examination, attention is paid to the entire pelvic region, but special importance is attached to the *rhombus of Michaelis* (Figure 4.10), the shape of which, together with other data, allows one to judge the structure of the pelvis. The boundaries of the rhombus are: on top of the supracracial fossa, from the bottom - the tip of the coccyx, on the sides - the posterior upper iliac spine.

If it is necessary to obtain additional data on the size of the pelvis, its conformity to the size of the fetal head, deformations of the bones and their joints, an x-ray examination of the pelvis is performed - X-ray pelvimetry (according to indications).

For the purpose of an objective assessment of the thickness of the pelvic bones, measure the circumference of the wrist joint of the pregnant woman with the centimeter tape (the Solovyev index, fig. 4.11). The average value of this circle is 14 cm. If the index is larger, it can be assumed that the pelvic bones are massive and its cavity is smaller than would be expected from the measurement of the greater pelvis.

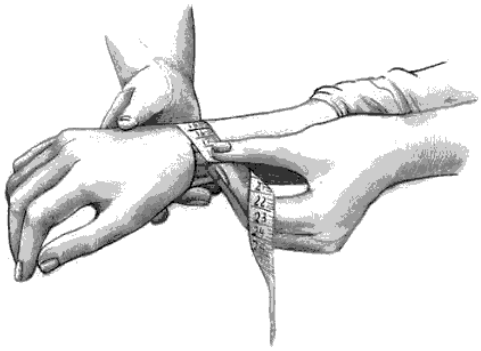


Fig. 4.11. Measurement of Solovyev's index

Abdominal palpation is the next stage of external obstetric examination. Fetal parts, size, location, position, presentation, station / engagement of the presenting part in relation to the true pelvis inlet, the amount of amniotic fluid are estimated during palpation; movements of the fetus are also felt. Abdominal palpitation of a pregnant woman is performed according to a certain plan, consistently applying four maneuvers of external examination (Leopold's Maneuvers).

The pregnant woman lies on her back, her legs are bent in hip and knee joints to relax the abdominal muscles. An obstetrician is standing to the right of a pregnant woman facing her.

The first maneuver: palms of both hands are located on the bottom of the uterus, fingers approach; a gentle pressure down determines the level of standing of the uterine fundus, by which the period of pregnancy is estimated. The first maneuver estimates the part of the fetus located in the uterine fundus.

The second maneuver: determine the position, type, position of the fetus in the uterus. Both hands from the bottom of the uterus are moved down to the level of the umbilicus and placed on the lateral surfaces of the uterus. Palpation of the fetal parts is performed alternately with the right and left hand. With the longitudinal position of the fetus, the back is felt on one side, the small parts – on the opposite side. The back is palpable as a proportional platform, small parts – as small protrusions, often changing position. The second maneuver allows you to determine the tone of the uterus and its irritability.

The third maneuver: serves to determine the presenting part. The examiner stands on the right, facing the pregnant woman. The right arm is placed slightly above the pubic articulation so that a thumb is on one side, and the other four are on the other side of the lower segment of the uterus. With slow

movements, the fingers are plunged into the depths and embrace the presenting part. The head is probed in the form of a dense rounded part, having distinct contours, capable of balloting. At pelvic presentation a sizeable, soft, neither round nor balloting part is palpated.

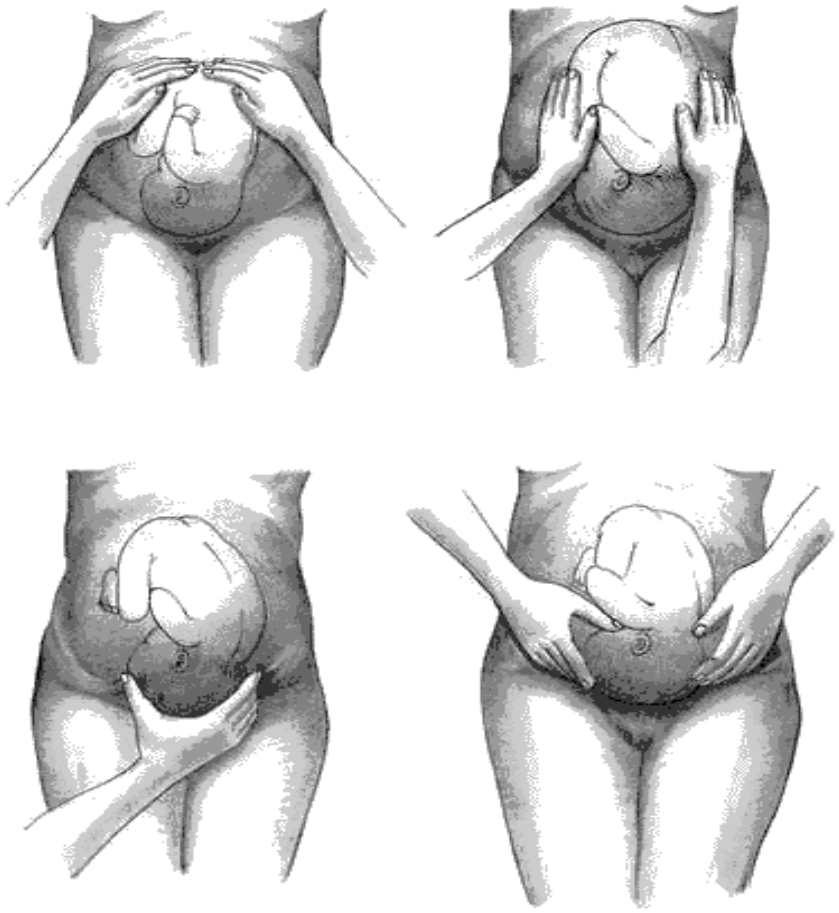


Fig. 4.12. Methods of external obstetric examination

The fourth maneuver: is the addition and continuation of the third one allows the examiner to determine the engagement of the presenting part into the birth canal in relation to the entrance to the small pelvis. Facing the maternal feet the tips of the fingers of each hand are used to gently and slowly penetrate between the presenting part and the lateral sections of the entrance to the pelvis and palpate the available areas of the presenting part. If the presenting part is mobile above the entrance to the pelvis, the fingers of both hands manage to almost completely bring under it, especially with pluriparea. In this case, the presence or absence of a *symptom of balloting*, characteristic of a head, is also determined. For this, the palms of both hands are tightly pressed to the side

portions of the fetal head, then the right hand is pushed in the area of the right side of a head. In this case, the head pushes to the left and transfers a push to the left hand.

There are the following levels of standing of the head in relation to the cavity of entry into the small pelvis:

1. The head of the fetus is mobile above the entrance to the small pelvis – the examiner can freely place the fingers under the head. The head is balloting.

2. The head of the fetus is pressed to the entrance to the small pelvis - you cannot place your fingers under the head, but all its shape can be taken above the entrance. Attempts to shift the head remain unsuccessful.

3. The fetal head with a small segment at the entrance to the small pelvis - the fingers move first inward towards the pelvic cavity, and then slide upwards, with the fingers diverge. Most of the head is above the entrance to the small pelvis.

4. The head of the fetus is a large segment in the pelvic cavity - the fingers move inward towards the pelvic cavity, and then slide upwards, with the fingers converging. Most of the head is in the pelvic cavity.

5. The head of the fetus in the cavity of the small pelvis - the shape of the head is not shaped by external techniques.

Auscultation. Next after palpation of the pregnant woman’s abdomen of the is listening to the heart tones of the fetus. Auscultation is made by an obstetric stethoscope, which is attached to the uncovered woman's abdomen by a wide end of the horn. During auscultation attention should be paid to the frequency, rhythm, sonority of tones. The fetal heart rate varies between 120 and 160 strokes. Tones should be clear and rhythmic. Heart tones are better auditioned on the side of the abdomen, where the frontal back is facing. At cephalic presentation heart tones are heard below the umbilicus, while at pelvic one – above the umbilicus.

ADDITIONAL METHODS OF SURVEY IN OBSTETRIC

Evaluation of the fetal heart activity. Cardiac activity is the most accurate and objective indicator of fetal state in ante- and intranatal periods. To assess it, auscultation with a fetal sthetosocope and cardiotocography are used.

Cardiotocography. There are indirect (external) and direct (internal) cardiotocography. During pregnancy, only indirect cardiotocography is used; now it is used during delivery as well, as the use of external sensors has no contraindications and does not cause any complications (fig. 4.13).

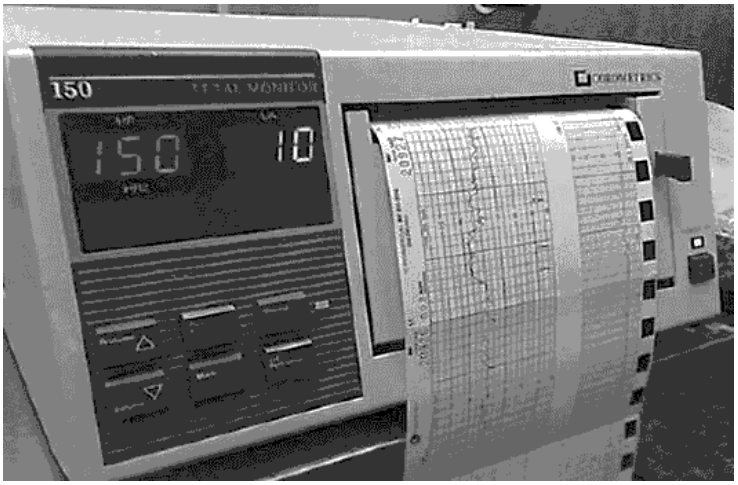


Fig. 4.13. Fetal cardiac monitor

The external ultrasonic sensor is placed on the anterior abdominal wall of a mother in the place where the fetal heart sounds are best audible, the external tensometric sensor is applied to the area of a fundus uteri. When using the internal method of registration at delivery, a special helical electrode is attached to the skin of the fetal head.

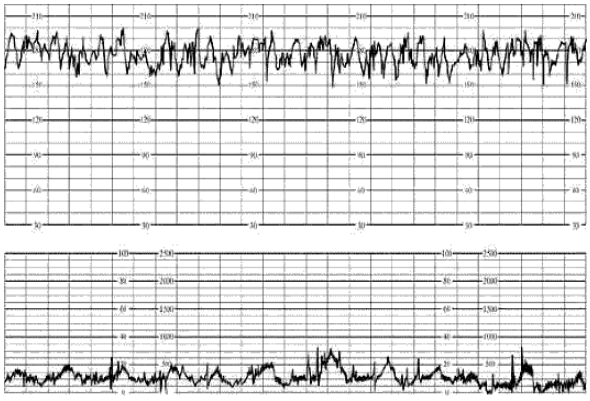


Fig. 4.14 Cardiotonogram

The study of cardiotocogram (CTG) begins with the estimation of a baseline heart rate. Baseline heart rate stands for the average value between the instantaneous values of the fetal heart rate, which remains unchanged for 10 min or more; the acceleration and deceleration are not taken into account.

When characterizing the baseline heart rate, it is necessary to take its variability into account, i.e. frequency and amplitude of instantaneous changes in the fetal heart rate (instantaneous oscillations). The frequency and amplitude of the instantaneous oscillations are determined for each subsequent 10 minutes. The amplitude of the oscillations is determined by deviation from the baseline heart rate, the frequency - according to the number of oscillations per 1 min.

In clinical practice, the following classification of variability types of baseline heart rate was most widely used:

- silent (monotonous) rate with low amplitude (0.5 per minute);
- slightly undulating (5-10 per minute);
- undulating (10-15 per minute);
- saltatory (25-30 per minute).

The variability of the amplitude of the instantaneous oscillations can be combined with a change in their frequency.

Ultrasound scanning (echography). Ultrasound is currently the only highly informative, harmless and non-invasive method allowing to objectively observe the development of the embryo from the earliest stages and make a dynamic observation of the fetus. The method does not require special preparation of a pregnant woman. In obstetric practice, transabdominal and transvaginal scanning is used. The establishment of pregnancy and evaluation of its development in the early period are the most important goals of ultrasound diagnostics in obstetrics. Diagnostics of uterine pregnancy with ultrasound is possible from the earliest possible time. From the 3rd week in the uterus cavity, the ovum starts to be visualized as a round- or ovoid-shaped echo-free lesion with a diameter of 5-6 mm. In 4-5 weeks, it is possible to detect an embryo - an echopositive stria of 6-7 mm in size. The head of the embryo is identified at 8-9 weeks in the form of a separate round-shaped anatomical lesion with an average diameter of 10-11 mm. The most accurate indicator of gestation in the first trimester is the coccyx-parietal size (KTP).

Evaluation of the embryo's vital activity in the early gestation period is based on recording its cardiac activity and motion activity. Embryo’s heart

activity can be recorded by ultrasound since the 4th-5th week. The heart rate gradually increases from 150-160 per minute at 5-6 weeks up to 175-185 per minute at 7-8 weeks with the subsequent decrease to 150-160 per minute by 12 weeks. The motion activity can be indicated since 7-8 weeks.

In the study of fetal development in the second and third trimesters of pregnancy, a head's biparietal size and circumference, the median diameter of the thorax, the abdomen's diameters or circumference, and the length of a femur are measured, and the estimated weight of the fetus is determined.

Doppler examination of blood flow in the mother-placenta-fetus system. There are quantitative and qualitative methods for assessing blood flow dopplerograms in the vessel under study. Qualitative analysis is widely used in obstetrics. The main value in this case is not the absolute value of the blood flow rate, but the ratio of blood flow rates into systole (C) and diastole (D). The most commonly used systolic-diastolic ratio (SDR), pulsation index (PI), for the calculation of which the average blood flow rate (BFR), as well as the resistance index (RI) are additionally taken into account.

Determination of the expected period of pregnancy and delivery

To determine the period of pregnancy and delivery, the date of the last menstruation (menstrual period) and the information on the first fetal movement are important. Often, the gestation period is set according to the day of supposed ovulation (ovulatory period), for which, in addition to the 1st day of the last menstruation, the length of the menstrual cycle is taken into account and the count is taken from the midcycle.

The expected delivery date is based on the estimate that a woman has a 28-day menstrual cycle with ovulation on the 14-15th day. In most cases, the pregnancy lasts 10 obstetric (lunar, for 28 days) months, or 280 days (40 weeks), when calculating the beginning of the first day of the last menstruation. Thus, in order to calculate the expected term of labor, by the date of the 1st day of the last menstruation, 9 calendar months and 7 days are added.

Usually the expected delivery date is calculated easier (**according to F.K. Naegele's rule**): nine months and seven days are added to the date of the first day of the last menstrual period.

The estimated date of delivery can be calculated **by ovulation**: from the 1st day of expected, but not occurred menstruation, count back 14-16 days and add 273-274 days to the obtained date.

When determining the estimated due date, the time of **the first fetal movement**, which is felt by a primipara since the 20th week, i.e. since the middle of pregnancy, and by a multiparous woman - approximately 2 weeks earlier (since 18 weeks). The expected date of delivery is estimated by adding 5 obstetric months (20 weeks) to the date of the first kick of a primipara or 5.5 obstetric months (22 weeks) of a multipara. However, it should be remembered that this feature has only a supplemental significance.

For the convenience of calculating the gestation period by menstruation, ovulation and the first movement of the fetus, there are special pregnancy table.

The gestation period can be determined by measuring the length of the fetus in the uterus and the frontal-occipital size of the intrauterine fetus head:

•***according to the Skulsky formula:***

$$X = \frac{(L \times 2) - 5}{5} (\text{months}),$$

where L is the length of the fetus in the uterus, measured by the pelvimeter;

•***according to the formula of Jordania:***

$$X = L + C \text{ (weeks)},$$

where L is the length of the embryo in the uterus measured by the pelvimeter, and C is the frontal-occipital size of the fetal head.

To determine the duration of pregnancy and the date of delivery, the objective survey data are of great importance: the size of the uterus, the volume of the abdomen and the height of the standing of the uterine fundus, the length of the fetus and the size of the head.

The size of the uterus and the height of its standing in different periods of pregnancy. At the end of the 1st obstetric month of pregnancy (4 weeks), the size of the uterus reaches approximately the size of the chicken egg. At the end of the 2nd obstetric month of pregnancy (8 weeks), the size of the uterus approximately corresponds to the size of the goose-egg. At the end of the 3rd obstetric month (12 weeks), the size of the uterus reaches the size of the head of the newborn, its asymmetry disappears, the uterus fills the upper part of the pelvic cavity, its bottom reaches the upper edge of the pubic arch (fig. 4.15).

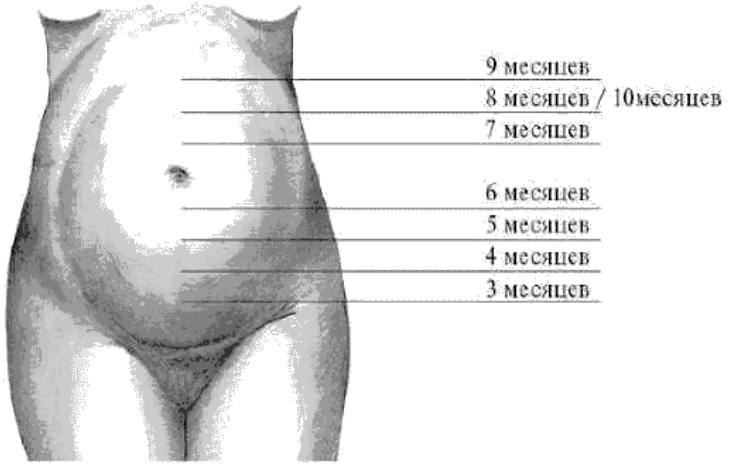


Fig. 4.15. The height of standing of the bottom of the uterus in various periods of pregnancy

From the 4th month of pregnancy, the bottom of the uterus is palpable through the abdominal wall, and the duration of the pregnancy is estimated by the fundal height. It should be remembered that the fundal height can be affected by the size of the fetus, the excess amount of amniotic fluid, multiple pregnancy, the wrong position of the fetus and other features of the gestation course. The fundal height during the estimation of the gestation period is taken into account in conjunction with other features (the date of the last menstruation, the first motion of the fetus, etc.).

At the end of the 4th obstetric month (16 weeks), the uterus bottom is located midway between the pubis and the umbilicus (4 fingers' breadth above the symphysis), at the end of the 5th month (20 weeks) the uterus bottom by 2 fingers below the umbilicus; the abdominal wall's outpouching is obvious. At the end of the 6th obstetric month (24 weeks), the uterus's bottom is at the level of the umbilicus, at the end of the 7th (28 weeks) the uterus bottom is determined 2-3 fingers' breadth above the umbilicus, and at the end of the 8th (32 weeks) the bottom of the uterus stands in the middle between the umbilicus and the xiphoid process. The umbilicus begins to flatten, the abdominal circumference at the level of the umbilicus is 80-85 cm. At the end of the 9th obstetric month (36 weeks), the uterus's bottom rises to the xiphoid and ribs' archs - this is the highest level of the bottom of the pregnant uterus, the abdominal circumference is 90 cm, the umbilicus is flattened.

At the end of the 10th obstetric month (40 weeks) the bottom of the uterus descends to the level at which it was at the end of the 8th month, i.e. up to the middle of the distance between the umbilicus and the xiphoid. The umbilicus

protrudes. The abdominal circumference is 95-98 cm, the head of the fetus descends, presses against the small pelvis inlet or stands as a small segment in the small pelvis inlet.

Sonographic determination of gestation. Ultrasonography is important in determining the duration of pregnancy. The main parameter for accurate ultrasound determination of pregnancy in the first trimester is the coccyx-parietal size (CPS) of the embryo. In the II and III trimesters, the gestation period is determined according to various fetometric parameters: biparietal size and head circumference, mean diameters of a chest and abdomen, abdominal circumference, femur length. The longer the gestation period, the lower the accuracy of determining the gestational age of the fetus due to variability in its size. The optimal ultrasound for determining the duration of pregnancy is ultrasound up to 24 weeks gestation.

Test questions and sample answers:

1. What is the duration of a person's pregnancy?

Sample answer: 40 weeks, or 10 lunar months, or 280 days.

2. What groups of pregnancy signs do you know?

Sample answer:

a) doubtful;

b) probable;

c) reliable;

3. What refers to doubtful signs of pregnancy?

Sample answer:

- nausea, vomiting, especially in the morning, changes in appetite, as well as food cravings;
- intolerance to some odors (perfume, tobacco smoke, etc.);
- dysfunction of the nervous system: malaise, irritability, drowsiness, mood swings, dizziness, etc.;
- increased frequency of urination;
- tender swollen breast;
- skin pigmentation on the face, along the white abdominal line, in the nipple area;

•the appearance of bands (scars) of pregnancy on the skin of the abdomen, mammary glands and thighs;

•increased abdomen volume.

4. What refers to probable signs of pregnancy?

Sample answer:

•termination of menstruation (amenorrhea) in a healthy woman of a reproductive age;

•the appearance of colostrum in nulliparas when pressing nipples;

•cyanosis of a vagina and cervix mucous membrane;

•uterus enlargement, its shape and consistency change.

5. What are the signs of pregnancy?

Sample answer:

•palpation of parts of the fetus;

•listening to the heartbeat of the fetus;

•fetal movements experienced by a doctor or midwife examining a pregnant woman;

•detection of fetus with ultrasound scanning.

6. What are the terms associated with the change in the shape, consistency and contractility of the uterus?

Sample answer:

•Snegirev's sign;

•Piskacek’s sign;

•Horwitz-Hegar’s sign;

•Genter’s sign;

•Gauss-Gubarev’s sign.

7. What is the sign of Horwitz-Hegar?

Sample answer:

Uterus during the examination is soft, malacia is especially pronounced in the isthmus area. In a two-handed study, the fingers of both hands converge in the area of the isthmus with almost no resistance.

8. What is Snegirev's sign based on?

Sample answer:

On the variability of the consistency of the pregnant uterus: during the two-handed study, the soft pregnant uterus becomes solid and contractible. After the cessation of irritation, the uterus again gets a soft consistency.

9. What is Piskacek's sign?

Sample answer:

Asymmetry of the uterus in the early stages of pregnancy is due to the protrusion of its right or left angle, which corresponds to the implantation of the ovum.

10. What is Genter's sign?

Sample answer:

Palpation of the comb-shaped thickening on the anterior surface of the uterus in the early stages of pregnancy.

11. What is the size of the uterus at 12 weeks of pregnancy?

Sample answer:

The size of a newborn's head or a man's fist.

12. At what level is the uterine fundus on average: at 24 weeks of gestation?

Sample answer:

At the end of the 6th obstetric month (24 weeks), the uterus's bottom is at the level of the umbilicus.

13. At what level is the uterine fundus on average:

a) at 28 weeks of gestation; b) at 32 weeks; c) at 36 weeks?

Sample answer:

a) 2-3 fingers above the umbilicus;

b) in the middle between the umbilicus and the xiphoid;

c) at the level of the xiphoid and costal arches.

14. Additional methods of examining a pregnant woman?

Sample answer:

- Cardiotocography.

- Ultrasound scanning (sonography).
- Doppler examination of a blood flow in the mother-placenta-fetus system.

15. Since when period does a) a primigravida; b) a multigravida starts feeling the fetal movements?

Sample answer:

a) since 20 weeks;

b) since 18 weeks.

16. How to determine the expected term of delivery according to the Naegele's formula?

Sample answer:

From the first day of the last menstruation, count back three months and add 7 days.

17. How to calculate the term of labor by ovulation?

Sample answer:

14 days are counted backward from the first day of the expected, but not occurred menstruation and 273-274 days are added to the date found.

18. What methods are used for external obstetric examination?

Sample answer: the maneuvers of Leopold.

A student should know:

1. Doubtful signs of pregnancy: a general characteristic of the group and particular signs.
2. Probable signs of pregnancy: general characteristics of the group and particular signs.
3. Reliable signs of pregnancy; general characteristics of the group, signs and methods for their determination.
4. Methods for detecting and recording the fetal heartbeat.
5. Objective methods of recording fetal movements.
6. Methods of collecting obstetric anamnesis.
7. Methods of obstetric objective research.

8. Leopold's maneuvers: the purpose of the research, the informative nature of each maneuver.

9. Formulas for determining the period of pregnancy and the expected date of delivery:

- by the day of ovulation;
- by the date of the first fetal movement;
- the fundal height;
- according to the formulas of Skulsky, Jordania.

A student should be able to do:

1. Measurement of the circumference of the abdomen.
2. Measurement of the fundal height.
3. Measurement of the external dimensions of the pelvis.
4. Definition of shape, rhomb of Michaelis,
5. Inspection of the cervix uteri in hand mirrors.
6. External obstetric examination with Leopold's maneuvers.
7. Objective registration of fetal movements.
8. Listening to the fetal heartbeat.
9. Determination of the gestational age and calculation of the expected date of labor by various methods.
10. Vaginal and two-handed gynecological examination**.**

Questions for self-study work:

1. Changes occurring in the body of a woman during pregnancy.
2. Changes in the sexual organs of a woman during pregnancy.
3. The most important goals of ultrasonic diagnostics in obstetrics.
4. Ultrasonic signs of changes in placenta as pregnancy progresses.
5. Doppler examination of blood flow in the mother-placenta-fetus system.
6. Determination of the biophysical profile of the fetus.
7. Ultrasound examination of the brain (neurosonography) of a newborn.
8. Determination of the degree of maturity of the fetus.
9. Determination of tissue pO2 of the fetus.
10. Fetal and newborn blood testing.
11. Biopsy (aspiration) of chorion villi.

Topic 5
EASY LABOR CLINICAL PICTURE AND MANAGEMENT

Learning goals and objectives: To get acquainted with the mechanism of the development of labor, the stages of childbirth, the clinic and the management of normal births.

Location of training: labor ward, predelivery room, study room, simulation class.

Teaching aids: Cardiotocograph, stopwatch, pelvimeter, stethoscope, centimeter tape.

Contents of the class:

Childbirth is ending of a pregnancy complex physiological process as a result of which expulsion of the fetus with all its embryonic formations (placenta, umbilical cord, membranes, posterior amniotic fluid) through natural maternal passage under the influence of expulsive forces.

Childbirth is a complex multi-component inborn reflex act, aimed at expulsion of the fetus from the uterine cavity after achieving its viability.

Characteristics of <u>easy labor</u> include the following indicators:

• singleton gestation;

• cephalic presentation;

• proportionality of the fetal head and pelvis of the mother;

• fetal health at normal functioning of the placenta;

• full-term pregnancy (38-40 weeks);

• coordinated labor that does not require correction;

• normal biomechanism of labor corresponding to the pelvic inlet;

• timely discharge of amniotic fluid (with cervical dilatation **for 6 or more cm**);

• absence of obstetrical traumatism (ruptures of maternal passage) and surgical interventions in childbirth;

• duration of childbirth: for primipara - from 8 to 12-14 hours, for multipara - from 6 to 8-12 hours;

• absence of the child's hypoxic, traumatic or infectious complications, developmental abnormalities or deformities;

• physiological blood loss in the consecutive and early postnatal period is not more than 0.5% of the parturient woman's weight.

If the birth begins at the 37^{th}-42^{nd} week of pregnancy, such delivery is called **term birth**, i.e. occurred timely. A mature, full-term fetus is born at term birth.

Birth on 22^{nd}-36^{th} week +6 days of pregnancy is called very premature, premature, **preterm**. Immature, premature fetus is born at premature birth. Births that occurred after 42 full weeks of pregnancy are called **postmature**.

Mechanisms of the labor onset

Completion of genetically programmed intrauterine development of the human fetus occurs at 38^{th}-40^{th} week of gestation. There is an intensive **synchronous preparation** of the mother and fetus organisms for the delivery process.

The epiphysis of the fetus exposes the factor that affects the adrenal cortex. Preparation for childbirth primarily **causes activation of the function of the *adrenal cortex of the fetus***.

The adrenals produce the following steroids: **dehydroepiandrosterone sulfate** (DHEAS) and glucocorticoid – **cortisol**. Herewith dehydroepiandosterone sulfate (DHEAS) is mainly produced by fetal zone, while cortisol – by the zona fasciculata of the adrenal cortex within the adrenal gland. Dehydroepiandrosterone sulfate (DHEAS) is the main precursor of estrogen biosynthesis in placenta. Due to the activity of sulfatase, placenta is able to intensively ablate the sulfate chain of dehydroepiandrosterone sulfate (DHEAS) and convert the *conjugated (bound) steroids into free ones*.

The level of **estrogens** directly depends on the functional state of the fetus (liver, adrenal cortex) and the placenta. It is the **fetus**, upon achievement of sufficient physiological maturity, that has a decisive influence on the production and the level of active estrogens in the placenta and blood of the mother.

Fetal cortisol activates the enzymatic systems of the placenta, providing products of unconjugated estrogens. Estrogens saturate the tissues of the mother's body (myometrium, cervix, vagina, articulations of the pelvic bones). The main function of cortisol in the preparatory pre-natal period is the formation and maturation of the enzyme systems of the fetal liver, including enzymes of glycogenesis. The content of tyrosine, aspartate aminotransferase increases. Under the influence of cortisol, the epithelium of the gastrointestinal tract (GIT) of the fetus transforms for a change-over to a different type of nutrition. There is

an acceleration of the maturation of the pulmonary tissue and the formation of a **surfactant system** to provide external respiration. A lack of surfactant can lead to a respiratory distress syndrome in a newborn.

Under the influence of **adrenocorticotropic hormone (ACTH)** of the fetus and the mother, there is an increase in the synthesis of fetal cortisol and dehydroepiandrosterone sulfate (DHEAS). Adrenocorticotropic hormone (ACTH) and cortisol of fetal and maternal origin enhance the synthesis of adrenaline and noradrenaline, affecting the adrenal medulla.

Chromaffin cells of the adrenal glands produce anti-stress substances - **opioid enkephalines**. The latter have an anti-stress and analgesic effect on the fetus needed in the labor process.

Preparing the mother's body for opening the external orifice of uterus and starting the mechanism of automatic labor includes structural changes in the tissues of the cervix, its lower segment, and myometrium.

There are changes in the system of hemostasis due to the activation of the vascular-platelet and procoagulant link and the relative increase in coagulation to **limit the inevitable blood loss** at placental separation.

In the preparation of the organism of a pregnant woman for childbirth, the change in the functioning of the nervous system is important. The dominant pregnancy in the central nervous system (CNS) is replaced by **the excitation focus**, which slows down the less necessary reflexes (food and defensive) by the law of induction. Reflexes, which ensure the course of the labor process, come to the fore.

Reactions to the stimuli of the external environment become more efficient, variable and unstable. Clinically, it is represented by increased drowsiness, decreased appetite, loss of body weight to 1 kg 7 days before the delivery, and mood swing.

Before childbirth, the intensity of interhemispheric connections increases, which strengthens the coordination of somatic, immune, hemostatic and neuroendocrine functions. Thus, the mother's organism is prepared for a severe and unsafe delivery process.

During pregnancy, the **uterine mass** increases on average from 50-75 g to 1000 g, and also the size of the myometrium cells increases. There are **two features** of smooth muscle tissue:

•firstly, every cell of smooth muscle tissue is capable of generating and extending action potentials in the same way that it occurs in skeletal and cardiac muscles,

•secondly, the autonomic contractile activity of smooth muscle tissue is not subject to conscious brain control.

There are three types of regulation of uterine activity (UA) - the main organ that determines the process of childbirth:

● endocrine (hormonal);

● neurogenic, carried out by the central and autonomic nervous system;

● myogenetic regulation, based on the characteristics of the morphological structure of the uterus.

Endocrine regulation: normal labor activity takes place against the background of the optimal content of estrogens. Estrogens are not considered to be direct factors of contractions' development, but they have important functions for the formation of receptors that react to the action of reducing substances.

The estrogens' mode of action:

● Participation in the formation of α-adrenergic receptors on the surface of membranes of smooth muscle cells reacting to oxytocic (oxytocin, prostaglandins, serotonin) and biologically active substances (catecholamines, acetylcholine, kinins).

● **Increased phospholipase activity. The destabilization of lysosomal membranes that release and activate prostaglandin E2 (PG-E2) and prostaglandin F2α (PG-F2α) from arachidonic acid.**

● Increasing the synthesis of contractile proteins in myometrium [actomyosin, adenosine triphosphate (ATP)], as well as the synthesis of proteins, fats, carbohydrates and other substances that provide energy of uterine contractions.

● Strengthening the permeability of cell membranes for ions, while the content of K + ions increases within the cell, which leads to a decrease in the membrane potential of rest. The sensitivity of myometrium cells to tactile, mechanical and chemical irritation increases.

● Impact on enzymes that causes an increase in the speed and intensity of biochemical reactions.

● Increased blood flow and increased blood circulation in myometrium, increased oxygen consumption, the intensity of oxidation-reduction processes, as well as energy supply to the uterus.

Along with hormonal factors, **serotonin, kinins** and enzymes participate in the regulation of motor function of the uterus. The hormone of the posterior pituitary gland (***oxytocin***) is considered to be the main one in the labor course.

Accumulation of oxytocin in the blood plasma occurs throughout pregnancy and affects the preparation of the uterus for active labor. The enzyme oxytocinase, produced by the placenta, maintains a dynamic balance of oxytocin in the blood plasma.

The most significant changes in the origin, development and maintenance of the automatism of birth pangs occur in the tissues of the fetoplacental barrier: the cells of the fetal aquatic membranes, membranes of the decidua, myometrium. **It is there that the synthesis of *prostaglandins* - the most powerful stimulants of uterine contraction. *Prostaglandins* are regulators, for the most part acting locally in the place of formation.** Influence on lumen of blood vessels, perfusion pressure of blood, diuresis, system of hemostasis of mother and fetus. The main site of local synthesis of prostaglandins is fetal, chorionic and decidual membranes. **In the amnion and chorion, prostaglandins E2 (PG-E2) of the fetus are formed, and in the decidual membrane and myometrium, the synthesis of both prostaglandins E2 (PG-E2) and prostaglandins F2α (PG-F2α) - maternal prostaglandins**.

The release of ***fetal cortisol***, fetal hypoxia, infection, changes in osmolarity of amniotic fluid, rupture of membranes, mechanical irritation of the cervix, the detachment of the lower pole of the fetal bladder, and other factors t***hat cause cascade synthesis and ejection of prostaglandins E2 (PG-E2) and prostaglandins F2α (PG-F2α)*** can lead to an increase in the synthesis of prostaglandins and the onset of labor.

Substrate for the formation of prostaglandins – polyunsaturated fatty acids, cell membrane phospholipids and arachidonic acid. Prostoglandin E2 (PG-E2) of the fetus and maternal prostaglandins F2α (PG-F2α) have a similar effect: on the one hand, they cause uterine contractions, on the other - affect the vessels and the hemostasis system. Their action is different.

Properties of prostaglandins E2 (PG-E2):

● have antiplatelet effect;

● reduce the tone of the vascular wall;
● increase the diameter of arterioles;
● improve blood flow and microcirculation.

Properties of prostaglandins F2α (PG-F2α):

● cause vasospasm;
● increase aggregation of erythrocytes and platelets, their main aim is to reduce the inevitable blood loss in childbirth;
● cause a strong contraction of the uterus, with a decline of microcirculation and often increases blood pressure (BP).

Prostaglandins of maternal and fetal origin act on the uterus synchronously: opening the calcium channel of the myocyte, increasing its tone, increasing contractile activity and energy supply, cause the automatism of contractile activity.

The multidirectional nature and the balanced ratio of prostaglandins *provide microcirculation in myometrium, adequate utero-placental and fetoplacental blood flow*.

Preservation of uteroplacental blood flow promotes **progesterone**, but its use during pregnancy and childbirth is **not recommended** for two reasons: firstly, there are no free hormonal receptors, and secondly, exogenously introduced hormones are destroyed by aromatase inhibitors.

Shortly before childbirth the factors activate the uterus:

● formation of receptors for prostaglandin and oxytocin;
● opening of membrane ion channels, increase in connexin-43 activity (the main component of intercellular contacts);
● increased electrical conjugation of myometrium myocytes - the impulse that has arisen extends over a larger distance;
● enhancing the synthesis of androgenic precursors of estrogen (androstenedione) in the adrenal glands of the fetus and increasing the activity of aromatase in the placenta.

Neurogenic regulation. There is a clear interdependence of the main types of regulation of contractile activity of the uterus (CAU). The coordination of contractions of longitudinal muscle bundles depends on the physiologic balance of the sympathetic and parasympathetic nervous system and the

localization of the pacemaker in myometrium during the active relaxation of circularly and spirally located muscle fibers. *Localization of the pacemaker in the myometrium and balance of the sympathetic and parasympathetic system also affects the synchronicity of the peaks of the contractile wave of all parts of the uterus, the increase in contraction of the bottom and body of the uterus in comparison with the lower segment.* Further, the function of the autonomic nervous system is to a certain extent dependent on the regulation of the cerebral cortex and the structures of the limbic complex, which performs the most delicate regulation of labor.

Myogenic regulation. Different parts of the uterus have different functional contractile activity by the time of the onset of labor. Conditionally in the uterus are **two** main functional layers of myometrium:

● external - active, powerful in the region of the uterine fundus, gradually thinning in the distal cervix;

● internal - expressed in the uterine cervix and in the area of the isthmus, thinner in the uterine fundus and uterine body.

In the process of giving birth, the outer layer is sensitive to oxytocin, prostaglandins and substances that have a tonomotor effect.

The inner layer of J. Daelz called the “zone of silence”, emphasizing its very weak contractile activity.

In the maternal body, with the onset of contractions, the intensity of biological reactions on the energy supply of the uterus increases, which is continually contracting and relaxing during many hours of labor activity.

A birth pang differs from the preparatory contraction by the frequency (1-2 contractions per 10 min), as well as the force of contraction of the uterus (the amplitude of contraction increases). Birth pangs cause smoothing and opening of the cervix. The interval from the beginning of one contraction to the next one is called the uterine cycle. The duration of the mother cycle is 2-3 minutes. The number of uterine cycles during childbirth is 180-300 or more.

There are 3 phases of development of the uterine cycle:

● onset and growth of uterine contraction;

● increased myometrium tone;

● relaxation of muscle tension.

Physiological parameters of uterine contractions are established by the methods of external and internal hysterography in uncomplicated childbirths.

Some parts of the uterus may have different contractile activity, which helps maintain a constant tone and intrauterine pressure both during and without pregnancy. **Preparatory coordinated** uterine contractions (contractions-precursors) are painless and separated by large intervals between individual contractions.

Preparatory contractions can last several hours and even days. The tone of the uterus remains normal. The behavior of a woman does not affect the frequency and intensity of prenatal labor. A woman tolerates them easily.

Precursors of childbirth are symptoms that occur a month or two weeks before the birth.

Childbirth precursors are:

•moving the center of gravity of the pregnant body anteriorly, leaning the head and shoulders back while walking ("proud walk"),

•pressing the presenting part of the fetus to the entrance to the small pelvis, as a result of which the uterine fundus descends (a month before the childbirth with primapara) and the amniotic fluid volume decreases. It is known that the largest amount of amniotic fluid (1200 ml) was noted at the 38^{th} week of pregnancy. After this period, the amount of amniotic fluid decreases every week by 200 ml,

•the presenting part of the fetus is firmly fixed in the pelvic inlet due to the disappearance of the endocervix, involved in the explication of the lower segment of the uterus,

•the **cervix** acquires softness, elasticity and elongation, which reflects the synchronous readiness of the “mother-placenta-fetus" system to the delivery process,

• **mucous-sutural secretions (cervix glands’ secretion) appear from the vagina**

•the vaginal walls become swollen, fleshy, moist, cyanotic, indicating a high **estrogen saturation**.

•there is an increase in the excitability of the uterus: palpation causes compression of the myometrium.

•labor precursors ("false contractions") start – separate coordinated contractions, which result in a gradual **shortening of the cervix**. The internal cervical suture smoothly passes into the lower segment of the uterus. Preparatory contractions usually occur at night, at rest state,

•there is a detachment of the amnions of the lower pole of the fetal bladder, which causes intensive synthesis of prostaglandins,

•the content of ACTH and cortisol increases in the blood of the mother and fetus as a reaction to the impending birth stress,

•a "**labor dominant"** develops in the central nervous system (CNS) which is a congestive excitation focus that regulates the process of delivery and preparation for it. There is a softening of the cervix, which sharply shortens and occupies a central position along the axis pelvis plane. In the uterus, the **pacemaker** is formed. This function is performed by a group of cells of the nervous ganglia, that right-handers most often have closer to the right tubal angle of the uterus.

Labor activity is to a large extent dependent on the readiness of the organism for childbirth. **Development of readiness takes place 10-15 days before childbirth**. The readiness of the organism is determined by the degree of "maturity" of the cervix and the sensitivity of the myometrium to uterotonic agents.

"Maturity" of the cervix"- the main criterion of readiness for childbirth.

•**Indirect signs of hormonal imbalance:**

• untimely onset of menarche;

• dysfunction of the ovaries (more often against the background of chronic inflammation of the uterine appendages);

• genital infantilism;

• fat metabolism abnormality.

•**Violations of the anatomical structure of the uterus:**

•Factors that provoke overgrowth of the muscular wall of the uterus (polyhydramnios, multinodality, large fetal sizes);

•chronic myometrium (sclerotomy of myometrium and reciprocally-contractile disorders);

•tumors of the uterus;

•Scars on the uterus;

•malformations of the uterus;

•genital infantilism;

•age over 35 years (the period of onset of physiological sclerosis of the myometrium).

•**Disruption of energy metabolism of uterine myocytes:**

• pathological preliminaries ("fatigue" of myocytes);

• factors that prevent labor through natural birth passage, scar changes in the cervix,

• a delayed pregnancy, disruption of the head configuration (often accompanied by impairment of fetal steroidogenesis);

• Anemia.

There are many different methods for assessing the “maturity” of the cervix. In all methods, the following parameters are taken into account:

● the consistency of the cervix;

● length of the vaginal and cervical canal of the uterus;

● degree of cervical canal patency;

● location and direction of the axis of the cervix in the pelvic cavity;

● the condition of the lower segment of the uterus and the thickness of the wall of the vaginal part of the cervix.

Table 5.1

Scale of cervical maturity (according to Bishop)

Parameter	Score	
	0	**1**
Cervical consistency	Firm	Softened around the periphery, the area of the internal pharynx dense
Cervical length	>2 cm	1-2 cm
Cervical canal permeability	The external sore is closed or passes the tip of the finger	The canal is permeate to the internal pharynx
The position of the cervix with respect to the axis pelvis plane	Posterior	Mid

When assessing **0-5 points**, the cervix is considered immature if the sum of the scores is **more than 10** - the cervix is mature (ready for childbirth) and labor induction may be applied.

Classification of cervical maturity according to G.G. Khechinashvili:

● ***Immature cervix uteri*** - softened only around the periphery and dense in the course of the cervical canal, and in some cases dense whole; The vaginal

part is retained or slightly shortened. The external sore is closed or passes the tip of the finger; determined at a level corresponding to the middle distance between the upper and lower edges of the pubic articulation.

● ***The maturing cervix*** of the uterus is not completely softened, the area of the dense tissue along the uterine cervix canal is still determined, and especially at the level of the internal pharynx. The vaginal part of the cervix is slightly shortened, the tip of the finger passes through the first-born external sap, or less often the cervical canal is passed for the finger to the internal pharynx, or with difficulty for the inner pharynx. Attention is drawn to the significant difference (more than 1 cm) between the length of the vaginal part of the cervix and the length of the cervical canal. There is a sharp transition of the cervical canal to the lower segment in the region of the internal pharynx.

The present part is palpated through the arches not clearly enough. The wall of the vaginal cervix is still fairly wide (up to 1.5 cm), the vaginal part of the cervix is located away from the wire axis of the pelvis. External sinus is defined at the level of the lower edge of the symphysis or somewhat higher.

● ***The not fully ripened cervix*** is almost completely softened, only in the area of the internal pharynx is still determined the area of the dense tissue. The canal in all cases passes for 1 finger for the inner yawn, in primiparas - with difficulty. There is no smooth transition of the cervical canal to the lower segment. The present part is palpated through the arches quite distinctly. The wall of the vaginal part of the cervix is markedly thinned (up to 1 cm), and the vaginal part itself is located closer to the wire axis of the pelvis. External sinus is defined at the level of the lower edge of the symphysis, sometimes lower, but not reaching the level of sciatic fossae.

● ***The mature cervix*** is completely softened, shortened or sharply shortened, the cervical canal freely passes one finger and more, does not bend, smoothly passes to the lower segment of the uterus in the area of the internal pharynx. Through the vaults, the presenting part of the fetus is clearly enough palpable. The wall of the vaginal part of the cervix is considerably thinned (up to 4-5 mm), the vaginal part is located strictly along the wire axis of the pelvis; External sores are determined at the level of sciatic lobes.

A few hours before the onset of labor, the pregnant woman has cramping pains in the lower abdomen, but these contractions are not long enough, not intensive enough and, most importantly, do not cause structural changes from

the cervix. This is a preliminary or pre-natal period. It lasts from 30 minutes to 6 hours, and then goes into regular labor activity.

Objective signs of the onset of labor:

- true labor contractions (regular, recurring, regular contractions of the uterus);
- departure of the mucous plug, colored with blood;
- shortening (smoothing) of the cervix, expansion of the uterine external orifice;
- sometimes the passage of amniotic fluid;
- the formation of a generic tumor on the presenting part of the fetus.

During childbirth, three stages are distinguished:

I - the stage of dilation;

II - stage of fetal expulsion;

III - the postnatal stage.

The average length of physiological labor is 6-12 (up to 18) hours. Births lasting less than 6 hours, called **fast**, and 4 hours or less - **rapid** or **rushed**. If the duration exceeds 18 hours, the birth is considered **prolonged.** Fast, rapid and prolonged births are pathological, as they are often associated with a risk of fetal injury, birthmarks, bleeding in the consecutive and early postnatal periods, and other complications.

I - the period of dilation (from the beginning of regular labor until the full dilation of the uterine orifice - 12 cm). The first stage of childbirth is the longest. It is characterized by the appearance of regular, sufficiently intense and prolonged contractions, which increase with the course of labor in terms of duration, intensity and frequency. The duration of the first stage of labor with primipara is 8-12 hours, in the case of re-births, 6-8 hours.

Dilating pains are rhythmic, recurring contractions of the smooth muscles of the uterus, which arise involuntarily and cannot be controlled by the woman's consciousness.

At the beginning of the first stage of labor, contractions are repeated at a frequency of 1 in 10-15 minutes, then 2 in 10 minutes, lasting about 60 seconds, at the end of the first stage, the frequency of dilating pains is 5 in 10 minutes, lasting 90-120 seconds. The intensity and duration of contractions is not the same during the first stage: in the beginning - 30-40 mm Hg, gradually increases by the end of the first stage to 60-80 mm Hg. The interval between contractions

decreases with the progression of labor, at the end of the first stage is about 60 seconds.

Features of the uterus contraction are determined by its structure and arrangement of muscle fibers.

From the midwife position, the uterus is divided into the body and the lower segment, which begins to form in the middle of pregnancy from the cervix and isthmus. Muscle fibers predominate in the uterus body, located longitudinally or obliquely. In the lower segment they are located circulatory (fig. 5.1).

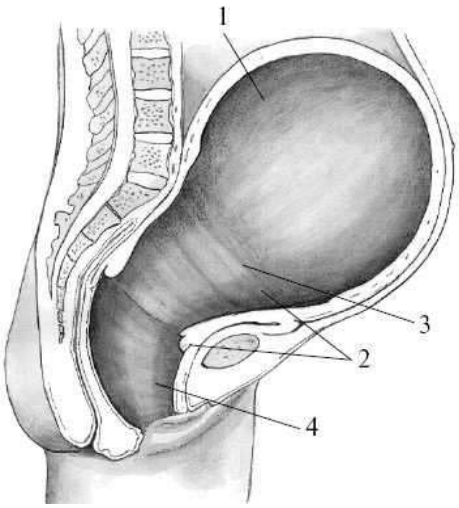


Fig. 5.1. The structure of the uterus in childbirth:
1 - the body of the uterus; 2 - the bottom segment; 3 - contraction ring; 4 - the vagina

The contracting activity of the uterus has two characteristics.

The first feature is the triple descending gradient and the dominant of the uterine fundus.

The muscles of the uterus body, cutting, contribute to thecervical dilatation and the fetal and afterbirth expulsion. The mechanism of contractile activity of the uterus is very complicated and is not fully understood. The theory of contraction proposed by Caldeyro-Barcia and Poseiro in 1960 was widely accepted. Researchers injected elastic microballoons at different levels into the uterine wall of the maternity at various levels, reacting to muscle contraction, and a uterine catheter reacting to intrauterine pressure was recorded in the uterine cavity and muscle contraction features were recorded its various departments. The scheme of uterine contraction by Caldeyro-Barcia is shown in the figure (fig. 5.2).

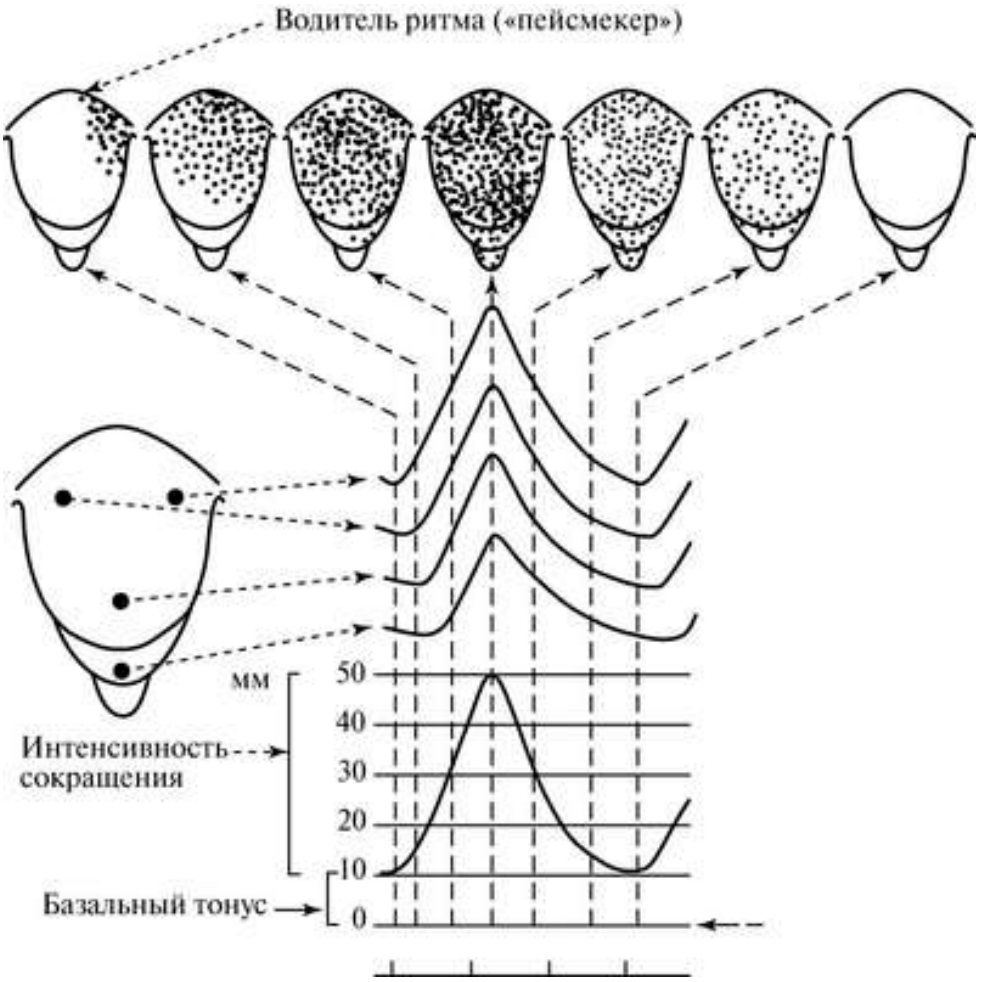


Fig. 5.2. Triple descending gradient (scheme) (Caldeyro-Barcia R., 1965)

As a result of the research, the rule of the ***triple descending gradient*** was formulated, the essence of which is that the uterine contraction wave has a certain direction from the top down (**1st gradient**); decrease the duration (**2nd gradient**) and intensity (**3rd gradient**) of contraction of the uterine muscles from top to bottom. Consequently, the upper parts of the uterus, with respect to the lower ones, contract longer and more intensively, forming the dominant of the uterine fundus.

Excitation and contraction of the uterus begins in one of the uterine corners (fig. 5.2), in the area of the pacemaker. The rhythm driver appears only in childbirth and is a group of smooth muscle cells capable of generating and summing up high charges of cell membranes, initiating a muscle contraction wave that moves to the opposite uterine angle, then passes to the body and the lower segment with decreasing duration and strength. The driver of rhythm is more often formed in the uterine angle, opposite to the location of the placenta.

The propagation velocity of the cut-off wave from top to bottom is equal to 2-3 cm/s. As a result, after 15-20 seconds, the cut covers the entire uterus. With normal coordinated labor, the peak of contraction of all layers and uterine levels occurs at the same time (fig. 5.2). The total effect of muscle contraction realizes the activity of the uterus and significantly increases the intra-amniotic pressure.

The amplitude of contraction, decreasing as it spreads from the fundus to the lower segment, creates a pressure in the uterus body of 50-120 mm Hg. and in the lower segment only 25-60 mm Hg. art. the upper parts of the uterus contract 2-3 times more intensively than the lower ones. Due to this, retraction is possible in the uterus - displacement of the muscle fibers upward. During contractions, longitudinally located muscle fibers, stretched in length, contracting, intertwine, shorten and shift relative to each other. During a pause, the fibers do not return to their original position. As a result, a significant portion of the musculature is displaced from the lower parts of the uterus to the upper ones. As a result, the wall of the uterus body progressively thickens, contracting more and more intensively.

The second feature of the contractile activity of the uterus is the reciprocity of the contractions of the uterus body and its lower parts: the contraction of the uterus body facilitates the stretching of the lower segment and the opening of the cervix. **The triple descending gradient**, the dominant of the uterine fundus and **reciprocity** is called the vertical co-ordination of the contractions. Normally, contractions of the right and left half of the uterus during synchronization occur synchronously - the coordination of contractions horizontally.

During each contraction in the muscular wall of the uterus, all muscle fibers and layers contract simultaneously - **contraction**, as well as their displacement relative to each other - **retraction**. During a pause, contraction is not complete, and retraction is partial. As a result of contraction and retraction of the myometrium, the muscles move from the isthmus to the uterine body (**distraction**), as well as the formation of the lower segment of the uterus, **smoothing the cervix and dilating the cervical canal**. During each contraction, intrauterine pressure increases to 100 mm Hg. Art. The pressure affects the fetal egg; thanks to the amniotic fluid, it takes the same shape as the cavity of the uterus.

The **amniotic fluid flows down** to the present part of the fetal membranes, while the pressure irritates the end of the nerve receptors in the walls of the cervix, which contributes to the intensification of contractions. Musculature of the uterus body and the lower segment of the uterus with stretching stretches the walls of the cervical canal to the sides and upwards. The contractions of the muscular fibers of the uterus body are directed tangentially to the circumferential muscles of the cervix, which allows the cervix dilation to occur in the absence of a fetal bladder and even the presenting part.

Thus, when the muscles of the uterus body contract (contraction and retraction), the muscle fibers of the body and cervix lead to the opening of the internal pharynx, smoothing the cervix and opening the outer throat (distraction). During contractions, the uterine part of the uterus adjacent to the isthmus stretches and is involved in the lower segment of the uterus, which is much thinner than the upper segment. The boundary between the segments of the uterus is called the **contraction ring** (see fig. 5.1) and has the form of a fissure. The contraction ring is determined after the outflow of amniotic fluid, the height of the ring above the womb, expressed in centimeters, shows the degree of the cervical uterus dilatation. At the same time, the lower segment of the uterus tightly covers the anterior head and forms an internal contact zone. The amniotic fluid is conventionally divided into the anterior, located below the level of contact, and the rear - above this level. Pressing the head of the fetus, which is covered by the lower segment of the uterus, along the entire circumference of the pelvis to its walls, forms an outer fit zone. It prevents the outflow of the rear fluid when the integrity of the fetal bladder and the outflow of amniotic fluid are disturbed.

The shortening and smoothing of the cervix in women giving birth and primiparous women takes place in different ways.

In primiparas before birth, the outer and inner pharynx are closed. There is a dilatation of the internal pharynx, shortening of the cervical canal and cervix, and then a gradual stretching of the cervical canal, shortening and smoothing of the cervix. Closed before that, the outer ("obstetric") pharynx begins to unfold. When fully exposed, it looks like a narrow border in the parturient canal (fig. 5.3).

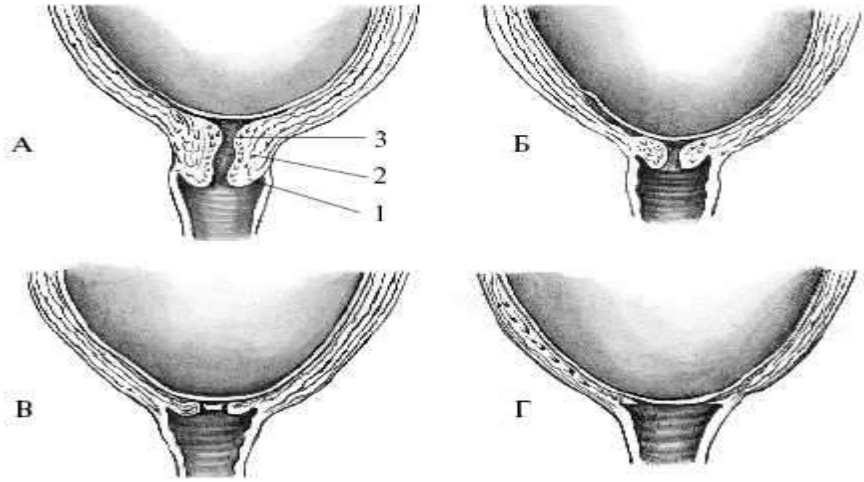


Fig. 5.3. Change in the cervix of the first birth (scheme):
А - cervix preserved: 1 - cervix, 2 - isthmus, 3 - inner pharynx;
Б - beginning of cervical smoothing; В - the cervix is smoothed;
Г - complete dilatation of the cervix

In the re-birth at the end of pregnancy, the canal of the cervix is traversed for one finger due to its extension by previous births. The dilatation and smoothing of the cervix occur simultaneously (fig. 5.4).

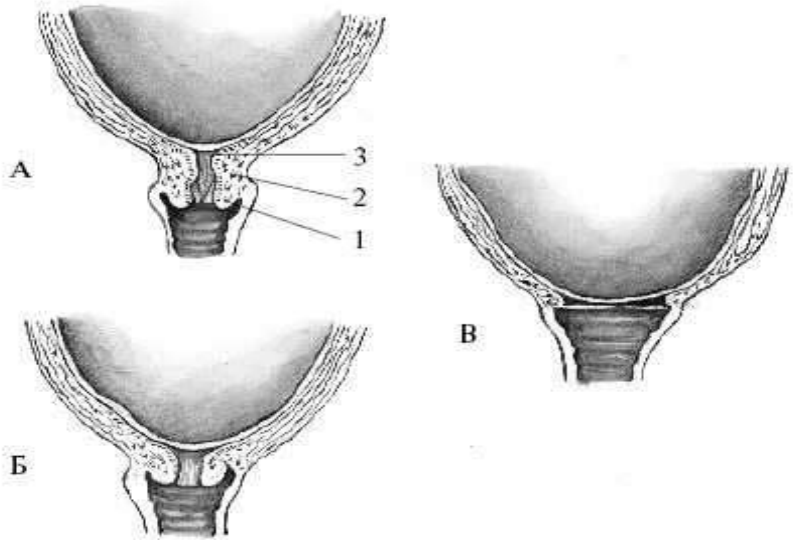


Fig. 5.4. Changes in the cervix during repeated birth (scheme):
А, Б - simultaneous smoothing and opening of the cervix:
1 - cervix, 2 - isthmus, 3 - inner pharynx; В - complete cervical dilatation

Timely rupture of the fetal bladder occurs with full or almost complete dilatation of the uterine orifice. **Rupture of the bladder before delivery is called premature, and with incomplete dilatation of the cervix (up to 6 cm) - early**. Sometimes due to the density of fetal membranes rupture of the bladder

does not occur and with full opening of the cervix (late autopsy). The effectiveness of contractile activity of the uterus is assessed by the rate of the uterine orifice dilatation and the lowering of the presenting part into the cavity of the small pelvis. In connection with the unevenness of the process of the cervix dilatation and passaging the fetus through the birth canal, several phases of the first stage of labor are distinguished:

● **I Latent phase:** begins with the establishment of a regular rhythm of labor and ends with smoothing of the cervix and uterine orifice dilatation for 3-4 cm. The phase is characterized by synchronicity of contractions of all parts of the uterus, triple descending gradient and complete coincidence of peaks of contractions of all parts of the uterus. When the uterine fundus and body contract, the transverse muscle fibers of the lower segment and cervix are relaxed. **The duration of the phase is about 5-6 hours**. The phase is called "latent", because contractions during this stage are low-painful or painless, with physiological births there is no need for drug therapy, the rate of dilatation is 0.65 cm/h.

● **II Active phase**: begins after the uterine pharynx dilatation by 4 cm. It is characteristic that there is an intensive labor activity and a fairly rapid the uterine pharynx dilatation. **The average duration of the phase is 3-4 hours**. The rate of opening in the primiparous is 1.5-2 cm/h, in the re-birth 2-2.5 cm/h. The preservation of the bladder before the cervix dilatation for more than 8 cm is inappropriate. An excessive density of shells or an insufficient increase in intra-amniotic pressure may prevent the spontaneous outflow of fluid in the active phase of childbirth. It is necessary to perform an amniotomy with the preliminary administration of antispasmodics. After the outflow of fluid, when the cervix is dilated for 4-5 cm, the time until complete dilatation is reduced by 30%.

● **III The phase of deceleration**: lasts from the cervix dilatation by 8 cm until complete dilatation.

In primiparas, the duration is from 40 minutes to 2 hours. This is possible that multipara may miss this phase.

The clinical manifestation of this phase is not always expressed, but its isolation is necessary to avoid unreasonable prescribing of rhythmostimulation, if during the stage of cervical dilatation from 8 to 10 cm there is an impression that labor activity has weakened. The change in the course of labor is due to the

fact that at this time the head reaches the plane of the ***narrow part of the small pelvis***, the fetus should be passed slowly and calmly.

II - the stage of expulsion (from the full disclosure of the cervix to the birth of the fetus). The duration of the second stage in the miscarriages is 20-30 minutes, in primiparas - 30 min - 1 hour.

Clinical signs of the onset of the second stage of labor are the discharge of amniotic fluid, the full dilatation of the uterine orifice, the appearance of exertion.

Muscular contractions are the contractions of the striated muscles of the anterior abdominal wall, the diaphragm, the muscles of the pelvic floor, which arise reflexively. These can be controlled by a delivering woman.

During the second stage, ***the third and fourth moments of the delivery biomechanism occur:***

•*the head's forcing its way into*: the lower pole of the head appears in the patulous vulvar slit during the pangs and is pulled back with its end (the inner turn of the head is completed, it is set by a swept seam in the direct size of the exit plane of the small pelvis, the fixation point is forming);

•*head eruption*: the head is installed in the genital slit and is not retracted outside of the attempt (a fixation point was formed - the suboccipitary fossa in the anterior form of the occipital insertion);

•at the beginning the back of the head is being erupted, then the parietal tubers, the forehead and the face of the fetus; complete birth (eruption) of the head corresponds to the end of its extension;

•the outer turn of the head (at the first position the face to the right thigh, at the second - to the left hip) and the inner torso rotation (the biacromial size is set in the direct size of the area of pelvic outlet, the front shoulder under the pubis);

•the birth of the back shoulder, then the entire thoracic girdle and the entire body;

•outflow of posterior amniotic fluid.

Usually, for fetal birth, 5-10 pangs are sufficient. With more prolonged pangs, there is a decrease in uteroplacental blood circulation, which can affect the cervical spine of the fetus. In the second stage, the shape of the fetal head changes - the skull bones of the fetus are configured to pass through the birth

canal. Besides, a *labor tumor* arises on the head - the cutaneous edema of the subcutaneous tissue located below the inner girdle of contact. In this place, there is a sharp filling of the vessels, fluid and the uniform elements of blood enter the surrounding cellulose. The emergence of the birth cancers occurs after the outflow of water and only in a living fetus. In the occipital insertion, a generic tumor arises in the area of a small fontanelle, on one of the parietal bones adjacent to it. The labor tumor does not have clear contours and soft consistency, can pass through the seams and fontanels, is located between the skin and the periosteum. The tumor dissolves itself a few days after birth. In connection with this, the labor tumor must be differentiated from the cephalohematoma that occurs during pathological births and is hemorrhage under the periosteum.

The total duration of the I and II birth stages is now 10-12 hours on average in primiparas, and 6-8 hours in the re-birth. The differences in the duration of labor in primiparous and re-parenting are noted mainly in the latent phase of the first stage of labor, whereas in the active phase, there are no significant differences.

III - the consecutive stage (separation of the placenta from the walls of the uterus and the release of the placenta).

The duration of the postoperative period in the first and the reproductive period is the same, up to 30 minutes, on average 10-12 minutes. Placental separation occurs under the influence of two factors: a sharp drop in intrauterine pressure after fetal expulsion and a significant decrease in the volume of the uterus itself. During the separation of the placenta, the vessels of the placental site are exposed, so bleeding occurs. The amount of physiological blood loss is determined for each woman in childbirth individually, it should not exceed 0.5% of body weight.

2 mechanisms of placenta separation:

- **According to Schultz** - the placenta is separated from the center, a retroplacental hematoma is formed, the central part of the placenta is protruded into the uterine cavity, the placenta is borne wrapped in fetal membranes;
- **According to Duncan** - separation of the placenta from the periphery, blood flows freely from the uterine cavity and the retropacental hematoma is not formed, is produced by the placenta outwards.

After the birth of the fetus, there is a sharp decrease in the volume of the uterus. After 5-7 minutes after fetal separation during 2-3 fights with amplitude up to 60-80 mm Hg. Art. there is a separation of the placenta and expulsion of the placenta. Before that the bottom of the uterus is located at the level of the umbilicus. A few minutes the uterus is at rest, the birth pangs pains that arise are painless. Bleeding from the uterus is slight or absent. After complete separation of the placenta from the placental site, the uterine fundus rises above the umbilicus and deviates to the right. The contours of the uterus take the form of an hour-glass, since in its lower section there is a detached afterbirth. When there is an attempt, the afterbirth is born. The blood loss during separation of the afterbirth does not exceed 150-250 ml (0.5% of the mother’s weight in the childbirth). After birth, the uterus acquires a density, becomes round, symmetrical, its fundus lies between the umbilicus and the pubis.

Current principles of labor management:

- assessment of the risk of pregnancy on the eve of childbirth;
- choice of an adequate method of delivery;
- childbirth monitoring of maternal and fetal status;
- analgesia of childbirth;
- careful providing maternal aid in childbirth;
- prevention of bleeding in the early postnatal period;
- assessment of the child's condition at birth and, if necessary, timely assistance;
- early application of the baby to the mother's breast.

Management of the first stage of labor.

In the first stage adhere to the expectant-active tactics of conducting labor, special intensive supervision, which includes:

1) complete objective general and obstetric examination, pelviometry - when a gravida enters the maternity ward;

2) establishing the exact time of onset of labor;

3) vaginal examination (determine the condition of the birth canal, the presence of scars, bone deformities or exostoses, the capacity of the pelvis, the degree of "maturity" of the cervix and the uterine orifice dilatation, the condition of the fetal bladder, insertion and advancement of the fetus, oriented at the

seams and fontanels at the head of the fetus); vaginal examination is carried out according to the indications - when the mother gives birth to the delivery unit, then every 4-6 hours to assess the dynamics of the uterine orifice dilatation and the advancement of the fetus, as well as the outflow of amniotic fluid, the suspected development of anomalies of labor, the clinically narrow pelvis, before carrying out DEA and others;

4) monitoring the status of the parturient woman (pulse, blood pressure, body temperature, etc.);

5) control over the state of contractile activity of the uterus and the fetus condition (auscultation of cardiac fetal tones, CTG);

6) filling out of the **partogram** (registration of the rate of cervical dilatation in the temporal aspect on a chart); filling out the partogram is the simplest but effective method of graphical management of births, which accurately reflects the dynamics of the birth process with the obligatory characteristics of the condition of the mother and the fetus. **Partogram** allows you to clearly differentiate the normal and abnormal course of delivery and identify a group of women who need help. ***Filling out of the partogram (by a midwife) in childbirth is carried out with the registration of the following indicators):***

- contractile activity of the uterus (tone, frequency, amplitude (including according to external hysterography), duration) - every hour;
- fetal heart rate - every 30 min;
- the height of the standing part of the fetal part (assessment of the lowering of the head by palpation of the abdomen) - every hour;
- the nature of the amniotic fluid - every hour;
- the dynamics of the uterine pharynx dilatation, the configuration of the head, the dynamics of the moving part of the fetus - the vaginal examination is performed according to the indications, but at least once every 6 hours (the outflow of amniotic fluid is an additional indication for vaginal examination).

7) the determination of the CBS of blood from the presenting part of the fetus (according to the indications);

8) administration of antispasmodic and analgesic agents.

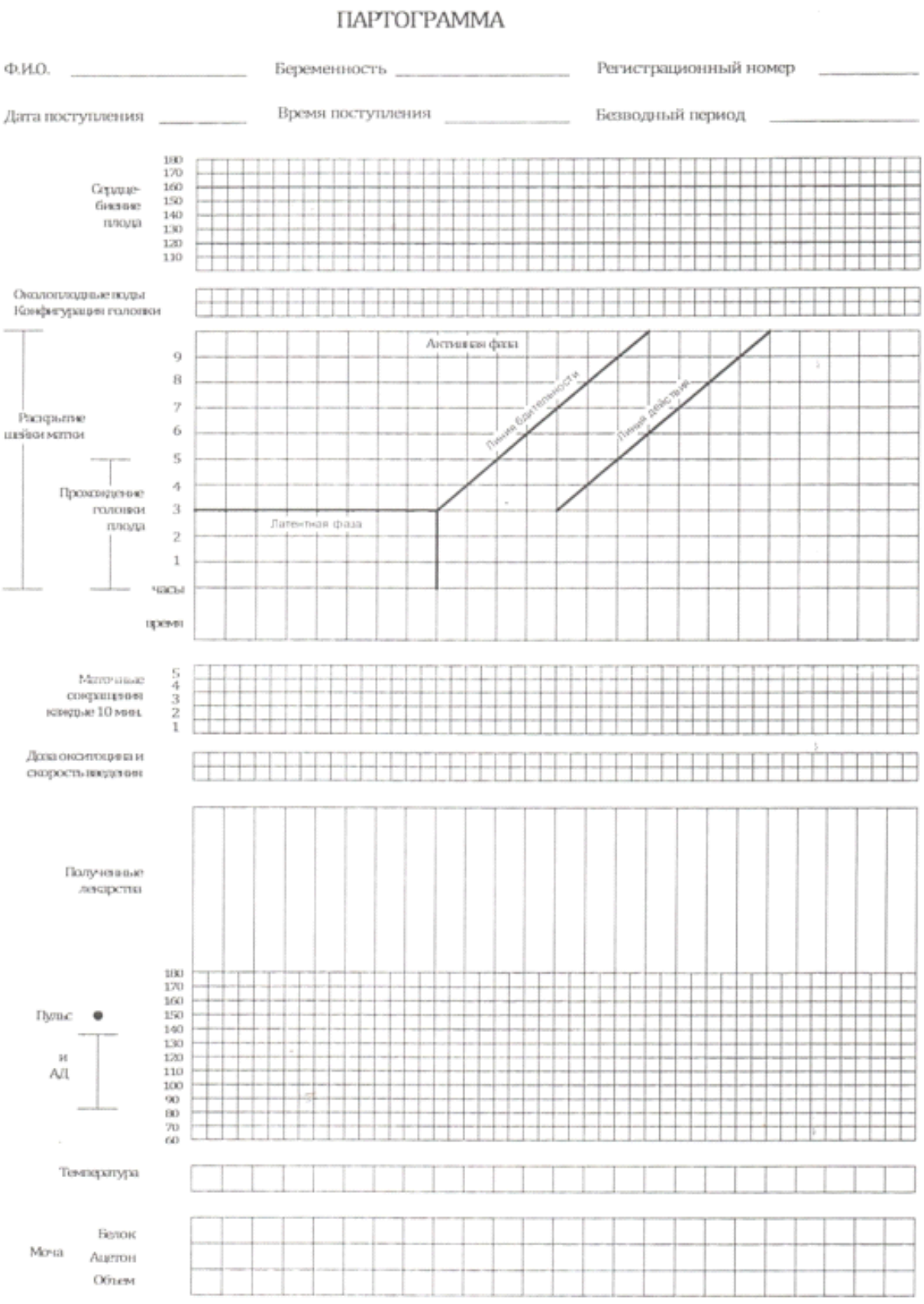


Fig. 5.5a. Samples of the partograph

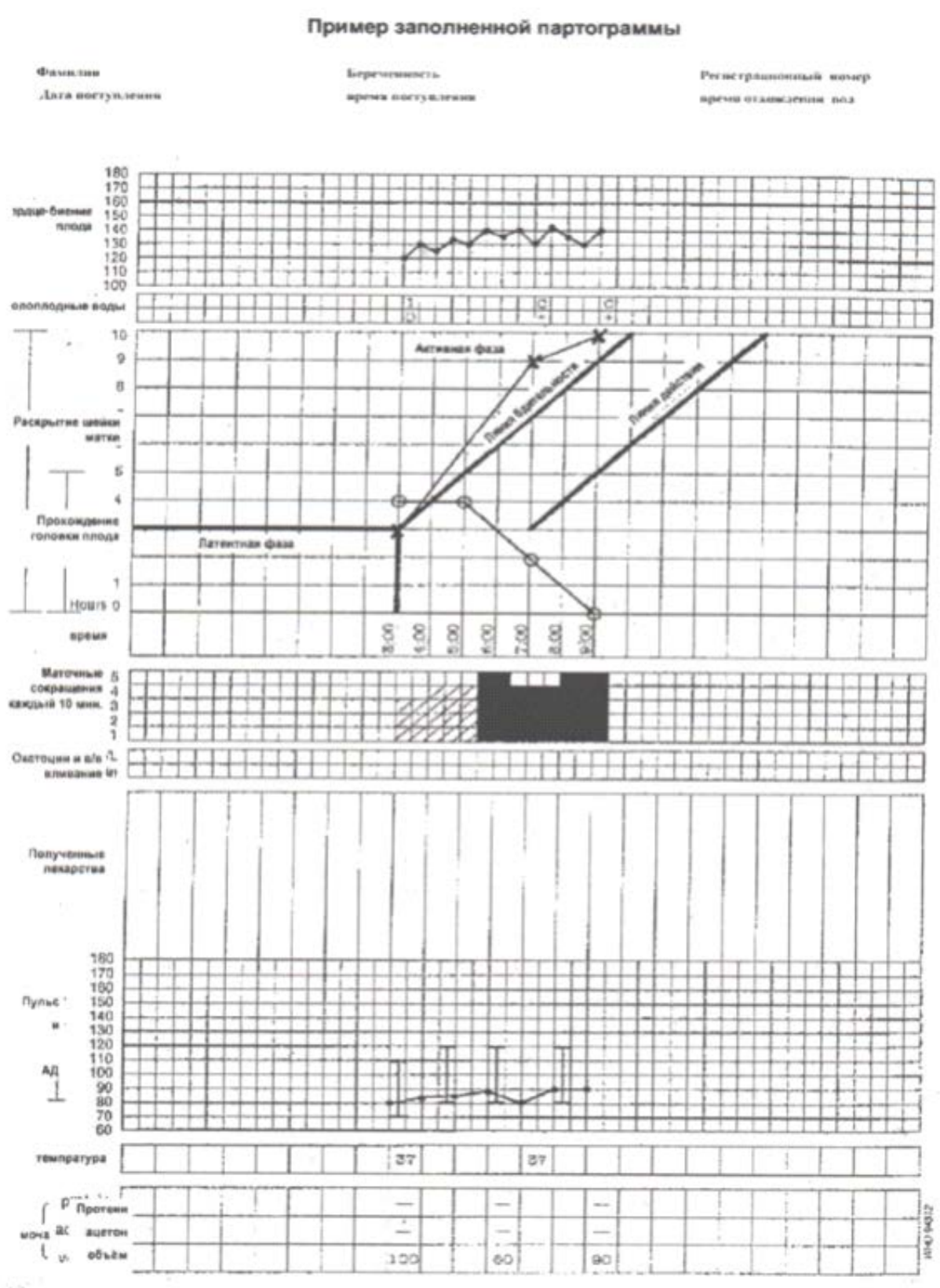


Fig. 5.5b. Samples of the partograph

Indications for continuous intranatal CTG monitoring

Indications from the mother:

- Cesarean section in history;
- pre-eclampsia;
- prolonged pregnancy (> 41 weeks);
- a long anhydrous period (> 24 hours);
- induced labor;
- gestational diabetes mellitus, diabetes mellitus;
- prenatal bleeding (signs of non-progressive placental abruption);
- scar on the uterus (anterior cesarean section, conservative myomectomy);
- Rhesus-conflict pregnancy;
- other medical indications related to the mother's physical illnesses (for example, childbirth through the natural birth canal by a woman with a cardiovascular disease).

Indications from the fetus:

- retarded fetal development;
- premature birth (prematurity);
- lack of fluid;
- abnormal results of dopplerometry of blood flow velocity in the umbilical artery (decrease in fetoplacental blood flow);
- Multiple fetuses;
- presence of amniotic fluid stained with meconium;
- pelvic presentation of the fetus.
- indications associated with the course of labor:
- stimulation of labor by oxytocin;
- epidural anesthesia;
- vaginal bleeding during labor (non-progressive placental abruption);
- mother's fever;
- amniotic fluid with dense meconium particles (fresh meconium).

The first childbirth stage is spent in the prenatal ward or in the individual maternity ward. External obstetric examination in the period of disclosure is performed systematically, noting the condition of the uterus during

and without the contractions. Records in the history of childbirth produce every 2 hours. Palpitation of the fetus is heard every 15 minutes. Observation of insertion and passage of the fetal head through the birth canal is performed with the help of external methods of palpation, vaginal examination, listening to the fetal heartbeat, ultrasound examination. Carrying out a vaginal examination is mandatory upon admission to the maternity hospital and the outflow of amniotic fluid, every 6 hours, and also according to the indications - in case of a deviation from the norm of the course of labor. However, in order to clarify the obstetric situation (the partograph's filling out, the orientation in insertion and advancement of the head, the evaluation of the location of the sutures and fontanels), it can be performed more often during labor.

Diagnosis of the outflow of amniotic fluid in most cases is not difficult. The detection of the head or clunises of the fetus or of the umbilical cord during vaginal examination indicates the outflow of amniotic fluid. In doubtful cases, a fluid from the posterior vaginal fornix is taken for the study, for which a "rear" mirror is applied. The content of amniotic fluid in the fluid taken from the posterior fornix is determined by microscopic examination of a dried smear (the so-called "fern pattern"). **The amniotic fluid** has an alkaline reaction and stains the test strip in a dark blue color. The presence in the contents of the posterior vaginal blood or urine can cause a false positive result of the sample. Also, the study notes the presence of an admixture of meconium, often observed during fetal hypoxia, although its primary detection is not pathognomonic for this pathology. If the "clean" amniotic fluid first flows, and then meconium appears, then one should think about fetal hypoxia. If the amniotic fluid is colored with blood, then eliminate the possibility of placental abruption. With preterm labor and suspicion of chorioamnionitis, a sowing of the vaginal discharge from the posterior vault is carried out. With premature births and the outflow of amniotic fluid, the degree of maturity of the fetus is determined by means of a froth test. When the painfulness of contractions is severe, anesthesia is necessary to maintain reciprocity of contraction of the upper and lower segments of the uterus, to eliminate spasm of smooth muscle fibers with circular anatomical orientation, to prevent tearing of the cervix in labor.

Strict bed rest is not necessary in **the first stage of labor**. It is possible to carry out the most convenient actions for a woman (shower, massage of the sacrum area, etc.).

For early diagnosis of intrauterine hypoxia, an evaluation of the fetal condition is necessary, in connection with which it is advisable to use periodic auscultation of the fetal heart and continuous CTG. Periodic auscultation of the heart in the fetus in the first stage of labor is carried out every 15 minutes, and in the second stage - after every attempt. According to retrospective studies, the use of this diagnostic method reduces the risk of fetal death, severe asphyxia of the newborn and late neurological disorders. In addition, with constant CTG, a low Apgar score occurs less often, then if using only periodic heart auscultation to monitor fetal status. When using only the method of periodic cardiac auscultation, the signs of the beginning fetal hypoxia can be omitted.

Management of the second stage of childbirth

The period of expulsion of the mother in childbirth is carried out in the delivery room, on a special bed in the position of a woman on her back with legs wide apart, bent in the hip and knee joints. In the second stage of childbirth, the general condition of the parturient continues to be monitored, the parameters of hemodynamics, the nature of the contractile activity of the uterus (frequency, strength and duration of attempts, the state of the lower segment of the uterus), the fetus.

During the passage of the fetal head through the cavity of the small pelvis, the position of the parturient woman on the side is the most physiological. In this position, there is a decrease in the tone of the uterus, resulting in an increase in the amplitude of contractions. The frequency of contractions does not increase or even decreases a little, there is an acceleration of the birth process, improvement of uteroplacental blood flow and blood supply, which is favorable for the fetus.

The egregious blunder of conducting labor is artificial stimulation of pushes at the beginning of the second stage with the full opening of the uterine pharynx and a high-standing head. Optimal lowering of the head to the pelvic floor in the position of the parturient woman on her side, 4-8 contractions-pushes will be enough for the birth of the fetus. With more prolonged attempts, deterioration of uteroplacental blood circulation takes place, which can affect the impairment of the fetal cervical spine. It is possible to observe the translational movement of the head: at first, the perineal prominence is noticeably enlarged, then stretching, the color of the skin becomes cyanotic.

Anus is protruding and patulous, the vulvar slit opens and, finally, the lower pole of the fetal head appears. Several times after the end of the attempt, the head disappears behind the genital slit, again showing at the beginning of the next push - **the fetal head's forcing its way into**. After a while after the end of the attempt, the head ceases to hide - **crowning** begins. It coincides with the beginning of extension of the head (birth of the parietal tubercles). Through unbending, the head gradually emerges from beneath the lumbar arch, the occipital fovea is under the lone articulation, the parietal tubercles are tightly covered with stretched tissues. Through the vulvar slit, first the forehead is born, and then the whole face when the perineum slips from them. The born head makes an external turn, then the shoulders and trunk come out together with the outflow of the hind water.

Passage of the fetal head during the period of exile should be continuous and gradual. The fetal head should not remain in the same area for more than an hour. During the eruption of the head, manual assistance is necessary. When extending the head of the fetus has a strong pressure on the pelvic floor, it is stretching, which can lead to rupture of the perineum. The walls of the birth canal squeeze the fetal head, there is a threat of disruption of the blood circulation of the brain. Provision of manual benefits for headache reduces the risk of these complications. Manual handling at cephalic presentation is aimed at preventing perineal tear. It consists of several moments, performed in a certain sequence.

● **The first moment** is to prevent early extension of the head. It is necessary that during the eruption the head passes through the vulvar slit with the smallest circumference (32 cm) corresponding to the small oblique size (9.5 cm) in the flexion state. The obstetrician, standing to the right of the woman in childbirth, puts the palm of her left hand on her womb, placing four fingers on the head of the fetus in such a way as to cover its entire surface protruding from the vulvar slit. Light pressure delays extension of the head and prevents its rapid movement through the birth canal.

● **The second moment -** reducing the perineal strain. The obstetrician puts their right hand on the perineum so that four fingers are tightly pressed to the left side of the pelvic floor in the area of the labium majus, and the thumb to the right side of the pelvic floor. With all his fingers, the obstetrician gently pulls and reduces soft tissues towards the perineum, reducing stretching. The

palm of this same hand supports the perineum, pressing it to the erupting head. Reducing the perineal tension in this way helps restore blood circulation and prevent the appearance of ruptures.

● **The third point** is the removal of the head from the vulvar slit while not pushing. After the end of the effort with the thumb and forefinger of the right hand, the obstetrician carefully stretches the vulvar ring over the erupting head. The head gradually emerges from the vulvar slit. At the onset of the next attempt, the obstetrician stops stretching the vulvar ring and again prevents the extension of the head. The actions are repeated until the parietal knobs of the head are closer to the vulvar slit. During this period, there is a sharp stretching of the perineum and there is a risk of rupture. At that moment, regulation of attempts is extremely important. The greatest stretching of the perineum, the threat of its rupture and injury to the head of the fetus, occurs if the head is born during an attempt. To avoid injury to the mother and fetus, it is necessary to regulate pushes – stop and release, or, conversely, extend and intensify.

The regulation is carried out in the following way: when the parietals of the fetal head pass through the vulvar slit, and the suboccipitary fossa is under the lone articulation, the birth attendant tells a gravida to breathe deeply to give birth, in order to reduce the force of exertion, since during deep breathing attempts are impossible. At this time, the delivery nurse with both hands delays the advance of the head till the end of the contraction. When a gravida is not pushing the delivery nurse squeezes the perineum over the fetus's face by the right hand in such a way that the perineum slides off the face. With their left hand, the delivery nurse slowly lifts the head upwards and unbends it. At this time, the woman is instructed to strain, so that the birth of the head occurs with the light tension. Thus, the delivery nurse by the instructions "to push" and "not push hard" achieves the optimal tension of the perineal tissues and the safe production of the densest and largest part of the fetus - the head.

● **The fourth point** is the release of the shoulder girdle and the birth of the trunk of the fetus. After the fetal head's birth, a gravida is instructed to push. In this case, an external turn of the head occurs and the inner rotation of the shoulders (from the first position the head turns to the right thigh of the gravida, from the second position to the left thigh). Usually the birth of the shoulders occurs spontaneously. If the spontaneous birth of the fetal shoulders did not occur, the delivery nurse grasps the head in the area of the temporal bones and

the cheeks with both hands. Easily and gently pulls the head downwards and backwards until the front shoulders fit under the lone articulation. Then the obstetrician with their left hand, palm of which is on the lower cheek of the fetus, grasps the head and lifts its top, and with their right hand gently removes the back of the shoulder, shifting the perineal tissues from it. Thus, the birth of the shoulder girdle occurs. The obstetrician enters the index fingers of the hands from the frontal back into the armpits, and lifts the torso anteriorly (on the mother's abdomen).

Depending on the condition of the perineum and the size of the fetal head, it is not always possible to retain the perineum, its rupture occurs. Since the healing of a cut wound proceeds better than a torn wound, in cases where a rupture is imminent, a **perineotomy** or **episiotomy** is performed.

Table 5.2

Assessment of the state of the newborn
Criteria for scoring a newborn by V. Apgar

Indicator	0 points	1 point	2 points
Appearance (skin color)	blue or pale	pink body, blue extremities (hyper-acrocyanosis)	pink all over
Pulse (heart rate)	absent	below 1000 bpm	over 100 bpm
Grimace (reflex irritability)	floppy	minimal response to stimulation	prompt response to stimulation
Activity (muscle tone)	absent	flexed arms and legs	high (active movements)
Respiration	absent	slow, irregular (hypoventilation)	vigorous cry or active movements

Assessment of the severity of the child's condition at birth is carried out using the criteria proposed in 1952. V. Apgar. According to this scheme, an assessment of 8 points or more in 1 min after birth testifies to the absence of asphyxia, 4-7 points - a sign of moderate asphyxia, 1-3 points - severe asphyxia. Assessment after 5 minutes after birth is currently not so much diagnostic as predictive value, because it reflects the effectiveness (or ineffectiveness) of ongoing neonatal resuscitation.

After drying, it is necessary to assess the state of the child and determine whether he/she needs resuscitation. When examining it is important to pay attention to the following:

• the presence of spontaneous breathing and heartbeats, the color of the skin - an evaluation of these signs allows you to determine the indications for urgent resuscitation within 30 s after delivery;

• detection of congenital defects and signs of diseases - allows to provide timely and adequate treatment;

• determining the degree of maturity of the child and the presence of intrauterine growth retardation.

Spontaneous breathing for 30 seconds after birth, loud cry, heart rate more than 100 pbm, pink skin color - signs of a satisfactory condition at birth.

The first examination of the newborn is desirable to be carried out immediately after birth, **on the breast of the mother**, in order to exclude severe pathology and control the adaptation of the child. Rehabilitation of the upper respiratory tract is carried out only according to indications, gastric intubation of a newborn is not recommended.

If the child's condition is satisfactory, after drying the skin, he/she should be placed **on the mother's abdomen** (epigastric area) and covered with a warm diaper.

Body weight at birth is fixed at the first measurement during the first hours after childbirth.

Umbilical cord clamping and cutting

Early clamping of the umbilical cord (right after delivery) can lead to a decrease in hemoglobin and the development of late anemia. On the other hand, too late pinching the cord often leads to the development of hypervolemia and polycythemia, which can be the cause of respiratory disorders, hyperbilirubinemia. It is recommended to clamp the umbilical cord **after 1 minute, but not later than 10 minutes after the birth of the baby.**

Clamping of the umbilical cord at the end of the first minute of life:

•Place one Kocher's clamp to the umbilical cord at a distance of 10 cm from the umbilical ring

•The second Kocher’s clamp should be placed on the umbilical cord as close as possible to the external genitalia of the parturient woman

•Place the third clamp 2 cm to the outside of the first, wipe the umbilical cord between the first and third Kocher’s clamps with a gauze-swab moistened with 95% ethanol, cut with sterile scissors.

The first breastfeeding attachment

Immediately after birth, a healthy child instinctively begins to search for food. Within a few hours of life the newborn is awake, active and ready for feeding. A child may be less active if the mother was prescribed sedatives or pain medications during labor.

It is very important to ensure full communication between mother and child right after delivery.

For the first successful breastfeeding it is necessary:

• when taking delivery, it is necessary to reduce the volume of medical intervention to a minimum;

• avoid, if possible, the use of medications that penetrate the placenta and cause drowsiness in the child;

• after giving birth, provide the child with contact with the mother "skin to skin";

• provide the mother and child with the opportunity to communicate with each other;

• help the child find a breast by properly applying it, if the mother is sedated or very tired.

The necessary procedures (weighing, secondary treatment of the umbilical remnants, swaddling the baby) are recommended to be performed after the first application of the baby to the breast, after he/she receives the first drops of colostrum.

The birth of a child and the first minutes and hours immediately after birth require a lot of physical and emotional tension from the mother. Counseling and assistance in the delivery room on breastfeeding right after the birth of the child lay the foundation for the correct feeding of the child in the future. Nonoccurrence of many problems with breastfeeding in the future depends on how quickly and correctly the child will be attached to the breast in the delivery room.

Umbilical cord remnants' retreatment

A single-use plastic clamp that is placed on the umbilical remnants with an optimal distance from the skin of the abdomen to the clamp of 1 cm is currently the most reliable and safe for the secondary treatment of the umbilical cord. When the clamp is applied too close to the skin, there may be a sore from rubbing. After applying the clamp, the umbilical cord is cut above the clamp, wiping out the blood.

Skin care for the newborn in the delivery room

The skin of the newborn is covered with vernix caseosa, which protects the skin during the period of intrauterine development. Removal of vernix caseosa in the delivery room is not recommended. If the skin of the child is contaminated with blood or meconium, care should be taken to remove the contamination with a cotton swab dampened with warm water.

Washing the baby under the tap in the delivery room is not recommended.

Eye Care

To prevent infectious diseases of the eyes during the initial toilet of a newborn, **it is recommended to use**:

- 1% ointment of tetracycline hydrochloride (single laying for the lower eyelid);

- ointment of erythromycin phosphate 10 000 units per 1 g (single laying for the lower eyelid).

It is not recommended to use a solution of silver nitrate, which can cause a newborn's chemical conjunctivitis and pain reaction. At present, there are no studies indicating the effectiveness of the use of albucid.

Maintenance of the third stage of labor.

The follow-up period is carried out expectantly, with careful and constant supervision of the gravida. It is necessary to keep an eye on the general condition of the woman, the coloring of the skin and visible mucous membranes, counting the pulse, measuring blood pressure, *monitoring signs of separation*.

There are several of these signs:

1) ***Schroeder's sign*** - a change in the uterine fundus shape and fundal height. Immediately after the birth of the fetus, the shape of the uterus is rounded, its bottom is at the level of the umbilicus. When the placenta is separated, the uterus flattens, becomes narrower, leans to the right;

2) ***Alfeld's sign*** **-** an extension of the outer piece of the umbilical cord. The exfoliated placenta descends into the lower segment of the uterus or into the vagina. In connection with this, the ligature imposed on the umbilical cord at the vulvar slit (during transection) is lowered by 10-12 cm;

3) ***a sign of Mikulich-Radetsky*** - the separated placenta descends into the vagina, there is an urge for a push;

4**)** ***Klein's testimony*** is the extension of the umbilical cord when the mother is pushing. If after an exertion the outer umbilical cord segment is not tightened, this means that the placenta has separated, but if it is tightened, it is not separated;

5) ***a sign of Kyustner-Chukalov*** - if the border of the hand is pressed against the pubic region, the umbilical cord, when the placenta is not separated, is drawn into the vagina; with the separated placenta, the umbilical cord is not retracted;

6) ***protrusion above the symphysis***, when the loosened placenta descends into the thin-walled lower segment of the uterus, the anterior wall of this segment, together with the abdominal wall, rises and forms a protrusion over the symphysis.

In the physiological course of the third stage, the afterbirth is discharged from the genital tracts on its own, but there are cases when **the separation of the afterbirth is delayed, then one should resort to its expulsion**.

First of all, the bladder should be voided and the mother is offered to push. Under the action of the abdominal tension, the separated placenta is easily born. If this simplest method turns out to be ineffective, resort to expulsion of the after-birth with external methods:

1) ***Abuladze's method*** **-** after voiding the bladder, gentle massage is performed: with both hands take the abdominal wall into the longitudinal fold and offer to push;

2) ***method of Genter*** - the bladder is voided; the uterine fundus leads to the median line. They come to the side of the mother, face to her feet, hands clenched into a fist, put the back surface of the main phalanges on the uterine fundus (in the area of the tube angles) and gradually press downwards and downwards; a gravida must not push;

3) ***the method of Krede-Lazarevich*** - this method is more traumatic, it is resorted to after the unsuccessful application of the two previous ones. The

technique is as follows: void the bladder, the uterine fundus is brought to the neutral position, an easy massage is used to cause a contraction of the uterus. The delivery nurse stands by the left side of the mother facing to her feet, the uterine fundus is clasped so that one finger is on the front wall of the uterus, the palm is on the bottom, and four fingers are on the back surface of the uterus. Squeeze the afterbirth out; compress the uterus in an anteroposterior size and simultaneously press down on its bottom in a direction downwards and forward along the pelvic axis.

The latter is carefully examined to ensure the integrity of the placenta and membranes.

Hypotonic bleeding is prevented in the consecutive and postnatal periods – by placing cold on the lower abdomen, intravenous uterotonics by routine administration of oxytocin **(at the first minute after birth of the fetus - 10 units IM / m or 5 units I / O slowly)**.

After the birth of the placenta, the vulva, the femoral internal surfaces and the perineum are washed with a warm disinfectant solution and the revision of the birth canals: they examine the external genitalia, the vagina, the cervix of the uterus. Discovered ruptures should be restored.

In the maternity ward, the new mother remains within 2 hours (**the early postnatal period**), and then is transferred to the postnatal department.

Test questions and sample answers:

1. What is childbirth?

Sample answer: A complex physiological process, in which there is an expulsion from the uterus through the birth canal of the fetus with its additional embryonic formations under the influence of expulsive forces.

2. What are the causes of the onset of labor?

Sample answer: Increase of excitability of muscular fibers of the uterus under the influence of complex neuroendocrine and biochemical changes occurring at the end of pregnancy.

3. What are the stages of a childbirth?

Sample answer:

a) the stage of dilation;

b) the stage of fetal expulsion;

c) the postnatal stage.

4. What is the duration of the first, second, third stages in the multipara?

Sample answer: The first stage - 6-8 hours, the second - up to 30 minutes, the third - 15-30 minutes.

5. What is the duration of the first, second, third stages of childbirth in primiparas?

Sample answer: The first stage is 8-12 hours, the second - up to 1 hour, the third -15-30 minutes,

6. What is the contraction of muscle fibers?

Sample answer: Reduction of muscle fibers.

7. What is retraction of muscle fibers?

Sample answer: Displacement of muscle fibers relative to each other.

8. What is a distraction?

Sample answer: Stretching of the circular muscle fibers of the cervix and the lower uterine segment.

9. What are the features of the disclosure of the cervix in primiparas?

Sample answer: Opening of the external pharynx is preceded by the opening of the internal pharynx and smoothing of the cervix.

10. What are the features of the disclosure of the cervix in multipara?

Sample answer: Opening of the external uterine orifice and smoothing of the cervix occur simultaneously.

11. What is the internal contact zone?

Sample answer: The place of contact of the soft tissues of the fetal head and the birth canal.

12. What is anterior amniotic fluid?

Sample answer: Amniotic fluid, located below the internal contact zone.

13. What is the posterior amniotic fluid?

Sample answer: Amniotic fluid, located above the internal contact zone.

14. What is called the timely discharge of amniotic fluid?

Sample answer: The effusion of waters at the opening of the cervix for 6 and more cm.

15. What is the early discharge of amniotic fluid?

Sample answer: Discharge of amniotic fluid in the first stage of labor, with opening of the cervix from 1 to 6 cm.

16. What is called premature discharge of amniotic fluid?

Sample answer: The discharge of amniotic fluid before the onset of labor.

17. What are the main parameters characterizing labor contractions? List them.

Sample answer:

a) frequency;

b) duration;

c) intensity;

d) spontaneity.

18. What concerns the objective indicators of the status of a gravida?

Sample answer:

a) body temperature**;**

b) pulse rate**;**

c) blood pressure;

d) bowel and bladder functions.

19. What are the ways to monitor the nature of the contraction?

Sample answer:

a) manual;

b) hysterography.

20. What are the characteristics of the evaluation of the cardiac activity of a healthy fetus in childbirth?

Sample answer:

a) on the frequency of heartbeat (120-160 beats per minute);

b) according to the rhythm (correct);

c) by timbre (coloring of the sound is clear)

d) according to CTG - basal rhythm, the number of oscillations, acceleration, deceleration, STV.

21. What are the moments of the biomechanism of labor in the first stage of labor?

Sample answer:

a) bending the head;

b) internal rotation of the head.

22. What are the clinical signs of the onset of the second stage of labor?

Sample answer:

a) full disclosure of the cervix;

b) the passage of amniotic fluid;

c) the beginning of attempts.

23. What are the main parameters characterizing attempts?

Sample answer:

a) frequency;

b) duration;

c) intensity;

d) randomness.

24. What are the methods of determining the position of the fetal head in the small pelvis in the second stage of labor?

Sample answer:

a) external obstetric examination;

b) vaginal examination.

25. What are the methods of manual benefits when a fetus is born in the cephalic presentation? List them.

Sample answer:

a) prevention of premature extension of the head;

b) prevention of rapid eruption of the head;

c) borrowing the tissues of the vulvar ring;

d) regulation of attempts;

e) removal of the shoulders according to the biomechanism of the delivery.

26. What are the main mechanisms leading to placental abruption?

Sample answer:

a) uterine contraction;

b) termination of the progesterone block;

c) the formation of retroplacental hematoma;

d) drop of the intrauterine pressure.

27. How do you know the options for the mechanism of placenta separation?

Sample answer:

a) central (according to Schultz);

b) edge (according to Duncan).

28. What are the most common signs of placental separation?

Sample answer:

a) a sign of Kyustner-Chukalov;

b) Alfeld's sign;

c) a Schroeder's sign;

d) Klein's testimony;

e) a sign of Mikulich.

29. What is the mechanism of postnatal haemostasis?

Sample answer:

a) uterine contraction;

b) thrombosis of the vessels of the placental site;

c) reduction of spiral vessels.

30. What kind of blood loss in childbirth is considered physiological?

Sample answer: Blood loss, not exceeding 0.5% of the body weight of the parturient woman, i.e. in the range of 200.0-400.0 ml.

A student should know:

1. What is childbirth?
2. Duration of normal pregnancy, the term of delivery.
3. Causes of delivery.
4. What is the preliminary period? What are its clinical manifestations, duration?
5. Periods of childbirth, their duration in the primipara and multipara.
6. Clinical signs of the first stage of labor, dynamics of contractions, contraction, retraction, distraction of muscle fibers.
7. Mechanism of cervical dilatation in the primipara and multipara.
8. Fetal bladder, its role in the mechanism of opening the cervix.
9. What is the contact zone, “forewaters” and “hindwaters”, “contraction ring”?
10. The notion of "timely", "premature", "earlier" discharge of amniotic fluid.
11. Examination of the parturient woman in the first stage of labor, indications for vaginal examination.
12. Keeping the first stage of childbirth.

•Clinical features of the second stage of labor, the condition of the parturient woman during labor.

A student must be able and manage to:

1. Estimate frequency, duration, intensity of contractions and attempts.
2. Produce auscultation of fetal heartbeat.
3. Prepare a gravida for delivery.
4. Normally deliver a baby outside the hospital.
5. Manage Eye Care in Newborns.
6. Produce preliminary and final treatment of the umbilical cord.
7. Determine the signs of separation of the placenta.
8. Allocate the separated afterbirth according to Abuladze, Genter, Krede-Lazarevich.

9. Determine the integrity of the placenta and membranes.

10. Inspect the birth canal after childbirth.

11. Determine and assess the magnitude of blood loss in childbirth.

Questions for self-study work:

- Preparing the mother and midwife for delivery.
- The essence and methodology of techniques to protect the perineum.
- Elements of the primary neonate care.
- Clinical features of the third stage of labor.
- Mechanisms of separation of the placenta, signs of separation of the placenta.
- Methods for separating the afterbirth.
- Mechanism of postnatal haemostasis.
- The concept of physiological blood loss.
- Prevention of bleeding during childbirth.
- Determination of the integrity of the placenta and membranes.
- Determination of the integrity of the birth canal.

Topic 6
PHYSIOLOGICAL POSTNATAL PERIOD: CHANGES IN THE ORGANISM OF THE NEW MOTHER, MANAGING THE POSTNATAL PERIOD

Objective of the class:

To study the physiological processes taking place in the mother's body, the clinic of the postnatal stage. To learn the principles of conducting the postnatal period, to prevent possible complications. To study the basic requirements of the sanitary and epidemiological regime in the postnatal department.

Place: maternity room, postnatal department, training room.

Visual aids:

Training models, slides, labor and delivery medical records, exchange cards, neonatal references, tables:

1. The condition of the uterus at various times of the postnatal period;
2. Condition of the cervix in various terms of the postnatal period;
3. The state of the endometrium and the timing of its regeneration in the postnatal period;
4. Biochemical composition of colostrum and milk;
5. Treatment scheme of mammary glands;
6. The order of the day in the postnatal department;
7. Complex of gymnastic exercises for new mothers.

Contents of the class:

The postnatal period (puerperium) begins with the expulsion of the afterbirth and lasts approximately 6-8 weeks. Early (within 2 hours after birth) and late postnatal period are recognized. During this time, important physiological processes are taking place in the mother's body: almost all the changes that have occurred in connection with pregnancy and childbirth in the genitals, endocrine, nervous, cardiovascular and other systems are taking place; the formation and flourishing of the function of the mammary glands takes place.

Changes in the body of the new mother

CNS condition and hormonal status. In place of the gestational dominant, characteristic for the period of pregnancy, in the central nervous system of the new mothers they are associated with the maternal instinct. There is a primary excitation in the cerebral cortex, which is often accompanied by the psychic lability.

The most significant changes in the postnatal period occur in the endocrine system: the level of placental hormones decreases sharply; the function of the hypothalamic-pituitary system is restored. To start lactation, estrogens, progesterone and prolactin are important, followed by prolactin and oxytocin. After cessation of feeding or in connection with a decrease in the expression of prolactin, the cyclic activity of the hypothalamic-pituitary-ovarian system and other endocrine glands is restored: thyroid, adrenal.

The interval between delivery and the appearance of ovulatory cycles is approximately 50 days for non-lactating and more than 100 days for lactating women.

Genital organs and mammary glands. In the first hours of the postnatal period, there is a significant reduction in the uterus; against a background of increased tone there are periodic contractions of its muscles (postnatal contractions), which contribute to a significant decrease in the size of the uterus. The reverse development of the uterus is called involution. After the end of labor, the uterine body quickly decreases. Within 14 days after birth the uterus has a spherical shape, somewhat flattened in the antero-posterior direction, its bottom is located 15-18 cm above the womb. The thickness of the uterus is greatest in the region of the bottom and decreases towards the uterine cervix. There is a small amount of blood in the uterine cavity. The cervix is passable by 2-3 fingers. From inside the walls of the uterus are folded, the placental area is a rough wound surface with blood clots in the vascular area. In other areas of the uterus the remains of the decidua and glands may be found, from which the endometrium subsequently regenerates.

The ligamentous apparatus of the uterus is stretched after birth, so it is easily displaced. When trying to squeeze out the remaining blood, the uterus can easily be displaced into the cavity of the small pelvis, the uterine cervix can reach the vaginal orifice. Within 2 weeks the mass of the uterus decreases rapidly: after birth, it is 1000 g, by the end of the first week - 500 g, by the end

of the second week - 325 g, the third - 250 g, by the end of the postnatal period - 50 g, i.e. it reaches the size of the non-pregnant uterus. The weight of the uterus in the puerperium is reduced because of the constant tonic contraction of the muscle fibers, which contributes to a decrease in blood supply and as a result of hypotrophy and even atrophy of individual fibers. Most of the vessels are obliterated.

The cervix of the uterus is subjected to the reverse development, so the diameter of the internal pharynx is equal to 10-12 cm immediately after birth, it is possible to insert a hand through the pharynx into the uterine cavity. Involution of the cervix is somewhat slower than the body. After 24 hours, the internal uterine orifice is formed and the cervical canal passes two fingers, and after three days it can hardly pass one. The formation of the orifice is due to the contraction of the circular musculature surrounding the internal opening of the cervical canal. By the 10th day after the birth the canal is completely formed, but the external uterine orifice is passed by the tip of the finger. The closure of the external uterine orifice ends completely at the 3rd week after delivery, and it acquires a slit shape.

At the same time, the internal (wound) surface of the uterus is healed and the regeneration of the elements forming the endometrium is gradual. Under the influence of proteolytic enzymes, decay and rejection of particles of the decidual membrane and blood clots lingered in the uterus occur. In this process, leukocytes participate, the mass migration of which from the deep layers of the uterus occurs in the first days of the postnatal period. A leukocyte shaft is formed, which prevents penetration of microbes from the cavity into the wall of the uterus. Epithelization of the inner surface of the uterus usually ends by 9-10 weeks, the recovery of the mucous membrane of the uterus at 6-7 weeks, and in the placental area - on the 8th week after delivery.

The speed of the involution of the uterus depends on a number of reasons; the general condition, the age of the woman, the characteristics of the course of pregnancy and childbirth, breast-feeding, etc. Slow involution (subinvolution) is observed in weakened and multiparous women, in primiparous over 27 years, after pathological birth. In lactating women, the uterus shrinks much faster than non-breastfeeding women.

In the process of healing the internal surface of the uterus, postnatal discharge appears - lochia, which is a wound secret. The character of the locia

during the postnatal period varies in accordance with the ongoing processes of purification and healing of the inner surface of the uterus. In the first days of the decay, along with the decaying particles of the decidual tissue, contain a significant admixture of blood; when microscopic examination, the prevalence of erythrocytes is noted; with 3-4 days of lochia acquire the character of a serous and supra-liquid with a predominance of leukocytes. By the 10th day, lochia become light, liquid without any admixture of blood. Gradually, the number of lochia decreases: from the 3rd week they become scarce, at the 5th-6th week of excretion from the uterus cease. With delayed involution of the uterus, lochia's discharge is prolonged, the admixture of blood lasts longer. If the internal uterine orifice is blocked with a blood clot, there may be a buildup of lochia in the uterus cavity - a lochiometer.

In the *fallopian tubes* within 2 weeks, the blood flow decreases, the edema disappears, they acquire the initial state.

Ovaries are slightly enlarged during pregnancy decrease, developing follicles at different stages are found in them; but ovulation, as a rule, does not occur during feeding due to the inhibitory effect of prolactin. However, the possibility of ovulation is still possible, as well as the onset of pregnancy during feeding.

The lumen of the *vagina* in the primiparous, as a rule, does not return to its original state, but remains broader; folds on the walls of the vagina are less pronounced. In the first weeks of the postnatal period, the capacity of the vagina is reduced. Swelling, hyperemia, vaginal abrasions disappear. Papillae (*carunculae myrtiformis*) of hymen are remaining.

The *ligamentous apparatus of the uterus* is restored mainly by the end of the 3rd week after childbirth.

Muscles of the perineum, if they are not injured, begin to restore their function in the first days and acquire the usual tone by the 10th-12th day of the postnatal period.

The abdominal wall remains relaxed for a long time as a result of overstretch and divergence of the muscles of the anterior abdominal wall, especially near the umbilicus. The discrepancy of the muscles, especially in the miscreant, can persist for life.

Mammary gland. During pregnancy, changes occur in the mammary glands that prepare them for the secretion of milk. Already during pregnancy

from the nipple, you can squeeze a drop of secretion - colostrum. Colostrum is a dense liquid alkaline reaction containing protein, fat droplets, epithelial cells from glandular vesicles and milk ducts and “colostrum” - large rounded cells that have fatty inclusions. Colostrum is rich in proteins and salts; it has less carbohydrate than milk. In colostrum there are vitamins, enzymes, antibodies.

The process of milk formation is regulated by the nervous system and lactogenic hormone of the hypophysis. This hormone causes the secretion of milk after the preparation of the parenchyma of the breast during pregnancy by estrogens (development of the excretory ducts) and progesterone (proliferation in the alveoli). Milk is a white liquid, which is a suspension of the smallest droplets of fat found in the serum. Milk has an alkaline reaction, it does not goagulate during boiling. Its composition is as follows: water 87-88%, protein 1.5%, fat 3.5-4.5%, carbohydrates (lactose) about 6.5-7%, salts 0.18-0.2%, Milk, like colostrum, contains vitamins, enzymes and antibodies.

The cardiovascular system. After birth, circulating blood volume (BCC), circulating plasma volume (CGT) and circulating red blood cell volume (OCS) decrease by approximately 13%. The decrease in BCC in the early postnatal period is 2-2.5 times higher than blood loss and is due to the deposition of blood in the abdominal organs with a decrease in intra-abdominal pressure immediately after childbirth. Subsequently, BCC and CGT increase as a result of the transition of extracellular fluid into the vascular bed.

Immediately after childbirth, ***tachycardia***, increased stroke volume and cardiac output, ***transient increase in blood pressure by 5-6%*** are often observed. The heart gradually assumes the usual position in the chest, the hemodynamic parameters quickly normalize.

During the first 2 weeks after delivery, ***hypercoagulability*** persists, which can provoke thromboembolic complications, especially after caesarian delivery.

The urinary system. Immediately after birth, hypotension of the bladder is observed, which is aggravated by prolonged labor, especially the second stage, as well as the presence of a large fetus. Hypotension of the bladder causes difficulty and violation of urination. The mother may not feel urge to urinate, it becomes painful.

Glomerular filtration, clearance of endogenous creatinine, increased during pregnancy, return to normal parameters by the 8th week of the postnatal period. Kidney blood flow decreases during the postnatal period. Its normal

level is finally established on average by 5-6 weeks after delivery. The causes of long-term regression of renal blood flow are not known.

Organs of digestion. In the postnatal period, due to some atony of the smooth muscles of the gastrointestinal tract, ***constipations*** can be observed that disappear with a rational diet and an active lifestyle. Often (in 80% of patients) after the birth, ***hemorrhoidal nodes*** appear that can be strangulated.

Management of the postnatal period

Within 4-5 days after giving birth, mother is usually in the postnatal department of the obstetric hospital. The possibility of infection is excluded when the chambers are filled cyclically, aseptic and antiseptic are observed (isolation of new mothers with signs of infection in the observatory compartment, careful sanitization of wards, furniture, bedding), use of disposable instruments and items of care.

Currently, the active tactics of conducting the postnatal period is undertaken. The new mothers stand up several hours after both physiological and caesarian delivery.

In the postnatal period, the following controls are carried out:

- general condition;
- indicators of hemodynamics;
- body temperature;
- mammary gland conditions;
- reduction (involution) of the uterus;
- discharge from the uterus;
- bowel and bladder functions.

After assessing the general condition, pulse, blood pressure, the ***condition of the mammary glands***, which gradually (on the 2-3th day) become evenly dense, are determined. The mammary glands are painless, when pressing on the nipple in the first days of it, colostrum is released, then milk. Nipples are carefully inspected for early detection of cracks. To avoid the formation of fissures, do not allow the baby to suck more than 5 minutes.

Before feeding and after each feeding, it is recommended to wash the mammary glands with warm water with baby soap in the direction from the nipple towards the armhole.

Beginning from the 3rd day, the woman uses a brassiere to prevent galactostasis and excessive breast engorgement. With a significant engorgement, which is often on the 3-4th day after delivery, drinking is limited, laxatives, diuretics, drotaverine, parlodel, dostinex are prescribed, physiotherapy is used. Hourly breastfeeding is refused now. The child is attached to the breast at their request. In this regard, breast mild expression is used only at the beginning of feeding with increased milk secretion. Congession phenomena in the mammary glands involving nipples' fissures may lead to the appearance of mastitis. Therefore, after each feeding, it is necessary to treat the nipples with a disinfectant solution (furacillin, rivanol).

Healthy women from the 2nd day after normal delivery are prescribed a set of gymnastic exercises that increase tone, improve blood circulation, accelerate the healing process, help strengthen the muscles of the prelum abdominale and pelvic floor. Gymnastics is prescribed by the doctor and is conducted under thier supervision.

Important importance in the postnatal period is given to the ***condition of the uterus***: its fundal height, consistency, soreness.

The fundal height above the womb is determined by a centimeter tape. Its value on the 1st day after delivery with a bladder voided is 15-16 cm and daily decreases by 2 cm. By the 10th day after birth, the uterus above the genital is not palpable. The uterus should be dense and painless. The inverse development of the uterus is promoted by the regular activity of the bladder and intestines. If contractions were painful, which may be characteristic of multipara, pain relievers and antispasmodics are prescribed.

More accurate information about the involution of the uterus is obtained with the help of ultrasound. Pay attention to the state of the uterine cavity, in which blood and tissue elements can accumulate.

By the 3rd day of the postnatal period, a small amount of blood clots and residuals of decidual tissue are detected in the uterine cavity with ultrasound. Most often, these structures are located in the upper parts of the uterine cavity on the 1-3th day of the postnatal period. In the future, the frequency of detection of echostructures in the uterine cavity is reduced. By the 5th-7th day of the postnatal period, they are usually localized in the lower parts of the uterus in the immediate vicinity of the internal pharynx.

The state of the postnatal uterus with ultrasound depends on the method of delivery. After cesarean section, the decrease in the uterus in length is much slower than during delivery through the natural birth canal. In addition, after abdominal delivery there is a thickening of the anterior wall of the uterus, especially pronounced in the area of the wound (lower uterine segment). In the projection of the wound, a zone of heterogeneous echo density of 1.5-2.0 cm wide and point and linear signals with low acoustic conductivity are visualized - reflection from ligatures.

Great attention is paid to keeping the external genitalia clean. Isolated from the genital tract of the lochia pollute the external genitalia and perineum and promotes the reproduction of microbes. Therefore, it is necessary to produce the toilet of the external genitalia of the parturient woman at least once a day, observing the rules of aseptic and antiseptic. Every morning and evening sutures are treated. Catgut sutures on the mucous membrane of the vagina, small labia are treated with a solution of brilliant green after a preliminary toilet. Silk sutures on the perineum are subject only to brilliant green treatment. Sutures of the perineum are removed on the 5th day. A woman is clysterized before.

In the normal course of the postnatal period, the puerperium and the newborn are discharged on the 4th-5th day under the supervision of a doctor of a woman's consultation and a district pediatrician.

Contraception in the postnatal period

During lactation, as a rule, ovulation does not occur and pregnancy does not occur. However, in 5% of women, despite lactation, after 6 weeks, the ovicell can maturate and pregnancy may occur. After 6 weeks after childbirth, it is recommended to resort to contraception. It is possible to use any barrier contraceptives and oral gestagenic preparations (dinestrenol, levonorgestrel and others).

Test questions the samples of answers:

1. What period is called the postnatal stage and how long does it last?

The sample of an answer: The puerperium begins with the expulsion of the afterbirth and lasts approximately 6-8 weeks.

2. What is the early postnatal stage and what is its duration?

The sample of an answer: The first two hours after delivery.

3. What indicators control in the early postnatal period and why?

The sample of an answer: blood pressure, pulse, the size of the uterus, the number of secretions from the genital tract; The early postnatal period is dangerous because of bleeding.

4. What do we mean by involution of the uterus?

The sample of an answer: The reverse development of the uterus after delivery, its gradual decrease in size, flattening, compaction, restoration of cyclic changes in the endometrium.

5. What is the dynamics of changes in the weight of the uterus?

The sample of an answer: Weight of a uterus after sorts 1000,0; by the end of the first week it decreases to 500.0 - 600.0; by the end of the second - up to 350,0; third to 200; by the end of the postnatal period, the weight of the uterus reaches 50.0 - 70.0.

6. What processes occur in the endometrium after the expulsion of the afterbirth?

The sample of an answer: The rejection of the decidual shell, the regeneration of the wound surface, the proliferation of the functional layer due to the epithelium of the donjev glands in the basal layer.

7. What are the lochia?

The sample of an answer: Detachable from the genital tract in the postnatal period, consisting of blood, scraps of fetal membranes, decidual membrane, secretion of endometrial glands, wound secretion.

8. What is the nature of the changes in losers on days of the postnatal period?

The sample of an answer: The first 2-3 days after childbirth, the lochia have a bloody character (Lochia rubra); starting from 3-4 days, lochia bloody-serous (Lochia rubra-serosa); with a predominance of leukocytes; on the 7-9th

day after delivery, they become serous (Lochia serosa); from 10-12 days they take the character of mucous secretions. The total number of lochia is not more than 500-1500 ml for 8 days.

9. When are the external and internal uterine orifices completely closed?

The sample of an answer: Internal - by 3 day; external - by the 10th-12th day of the postnatal period.

10. What is the subinvolution of the uterus and what is the main principle of its diagnosis?

The sample of an answer: Slow back development of the uterus; the delay in decreasing the height and width of the uterus daily in the postnatal period.

11. Why is it necessary to follow the function of the bladder and intestines in the postnatal period?

The sample of an answer: The overflowed bladder and rectum contribute to the subinvolution of the uterus.

12. What are the features of the delivery of the puerpera in the postnatal period?

The sample of an answer: The food should be high-calorie, and the first 3-4 days without excess of fiber, and the following days the food is ordinary.

13. What is the lactational function of mammary glands?

The sample of an answer: In 1-3 days of the postnatal period colostrum is allocated, from 4-5 days - milk.

14. What are the characteristics of the biochemical composition of colostrum and milk?

The sample of an answer: The specific gravity of the colostrum is higher, 1026-1036, the reaction is alkaline, contains 2.25% protein, many fat cells, the epithelium of the milk ducts; milk has a neutral reaction, specific gravity 1031, protein content 1.5%, fat 3.5-4.5%, a large number of vitamins, carbohydrates.

15. How many hours after normal delivery is a healthy newborn baby applied to the mother's breast?

The sample of an answer: After 6 - 12 hours.

16. What is the preparation of mammary glands for feeding?

The sample of an answer: Washing of mammary glands by warm boiled water 2-3 times a day; before feeding, the nipples are treated with a 2% solution of boric acid or a solution of furicillin, 1-2 times a day after feeding with an alcoholic solution of brilliant green grass.

17. What is the basis for the prevention of septic complications in the postnatal period?

The sample of an answer: Compliance with the principles of asepsis and antiseptics.

18. How many times and how is the treatment of the external genitalia of the puerperas?

The sample of an answer: Not less than 2 times a day; by washing with a disinfectant solution, from top to bottom.

19. What regimen is prescribed for a healthy puerpera?

The sample of an answer is: Active.

20. What are the types of sanitary education work carried out for the puerperas in the postnatal period?

The sample of an answer: Conversations, classs, the school of mothers, sanitary bulletins.

21. What is the purpose of postnatal gymnastics?

The sample of an answer: Restoration of the physiological state of the muscles of the anterior abdominal wall and pelvic floor.

A student should know:

- Duration of the postnatal period.
- Changes occurring in the neuroendocrine and cardiovascular systems of the puerperas.

•Physiology of lactation, biochemical composition of colostrum and milk.

•Changes occurring in the sexual organs of a woman in the postnatal period.

•Maintaining a normal postnatal period.

•Hygiene of the parturient mother,

•Care for mammary glands, prevention of mastitis.

•Care for sutures on the perineum and vaginal mucous.

•Time of discharge of a healthy puerperm from a maternity hospital.

•Determination of the duration of post-delivery leave.

A student must be able and manage to:

•Determine the fundal height, its consistence, mobility.

•Palpate the mammary glands.

•Express mammary glands.

•Catheterize the bladder.

•Produce intimate wash of the puerpera.

•Know technique of processing sutures on the perineum, the vaginal mucous, the cervix.

•Conduct normal postnatal period.

•Fill out the prenatal/delivery record, a newborn's certificate, post-delivery leave documentation.

Questions for self-study work:

•Structure of the postnatal department.

•Principles of organizing the postnatal department.

•Sanitary-epidemiological regime in the postnatal department.

•Changes occurring in the neuroendocrine and cardiovascular systems of the puerperas.

•Physiology of lactation, biochemical composition of colostrum and milk.

•Changes occurring in the sexual organs of a woman in the postnatal period.

•Pediatric hygiene.

•Features of the diet of the puerpera.

•Medications for contraception in the puerperium.

Topic 7
FETAL PELVIC PRESENTATION

Goals and objectives: to study the causes of pelvic presentation, classification, methods of diagnosis and management of labor, as well as the most typical complications in pelvic presentations. Using a phantom and a doll, learn the technique of providing benefits by the method of Tsov'anov with the presentation of the frank breech and foot presentation, as well as manual handling in a classical way.

Study venue: prenatal departments, maternity room, training room, simulator class.

Visual aids: phantoms, dolls, pelvis. Pictures, models depicting varieties of pelvic presentations, moments of biomechanism of birth and, obstetric care, complications with pelvic presentations.

Contents of the class:

Pelvic presentation (praesentatio pelvica) is a presentation in which the breech and / or legs / leg of the fetus are the presenting part.

The frequency of pelvic presentation is 3-5% of all births.

Pregnancy and childbirth in pelvic presentation are *pathological*, since in this type of presentation more complications are observed in the mother (uterine cervix, vagina, perineum, damage to the iliacus and pubic articulations, postnatal haemorrhages and postnatal infectious diseases), and fetus (CNS trauma, asphyxia, hemorrhages in the uterine cervix muscles, limb fractures, joint dislocations, damage to the brachial plexus, dysplasia or congenital dislocation of the hip joints).

At long date, children born in pelvic presentation may experience paresis of limbs, psychomotor development backwardness, encephalopathy, hydrocephalus.

Perinatal mortality in pelvic presentation of the fetus is 2-3 times higher than in the cephalic.

Unfavorable perinatal outcomes are due to the fact that the first is born of a less voluminous part of the fetus - the pelvic end, followed by a larger head, which can cause difficulties in its birth.

Classification of pelvic presentations

It is accepted to distinguish the following varieties of pelvic presentations (see fig. 7.1):

1. Breech (flexural);
2. Foot (extensor).

Breech presentation is divided into presentation of the frank breech and mixed breech.

In the presentation of the frank breech the fetal buttocks are placed at the entrance to the small pelvis; legs are stretched along the trunk (hip joints are flexed; the knee joints are straightened).

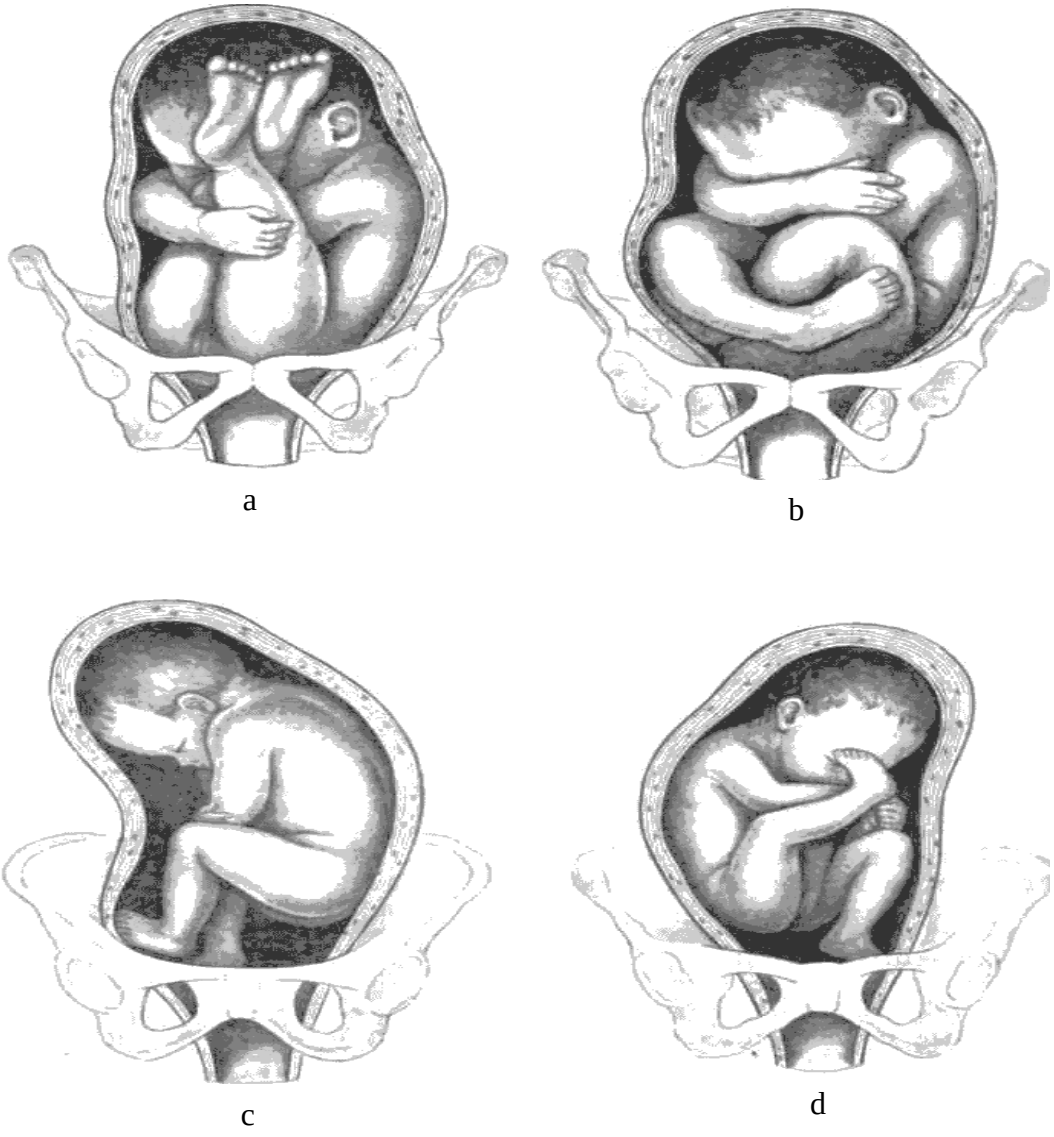


Fig. 7.1. Variants of pelvic presentations:
a - presentation of the frank breech; b - mixed breech presentation;
c - full leg presentation; d - incomplete leg presentation

With mixed presentation of the frank breech to the entrance to the small pelvis along with the buttocks are the feet of the legs. The legs are flexed in the hip and knees are straightened in the ankle joints - the fetus seems to be squatting.

Leg presentations are complete and incomplete. At ***full leg presentation*** both legs of the fetus are presented, with *incomplete leg presentations* - one, the second leg is stretched along the trunk. A kind of leg presentation is the knee presentation, which transfers to the leg presentation during delivery.

Among the variants of pelvic presentation, most often (64%) there are breech presentations, extremely rarely - knee presentations (0.3%).

The causes of pelvic presentation can be divided into maternal, fetal and placental. These reasons can prevent the insertion of the head to the entrance to the small pelvis, limit or increase the mobility of the fetus in the uterus.

Maternal factors, contributing to pelvic presentations, include anomalies of the development of the uterus (bicornuate, arcuate, etc.); uterine myoma, especially located in the lower segment of the uterus; deformities and tumors of pelvic bones; narrow pelvis; decrease in the tone of the uterus in multi-generators or its increase with the threat of abortion; functional inferiority of uterine muscles.

Fetal factors include fetal growth, fetal growth retardation, prematurity, congenital fetal anomalies (anencephaly, hydrocephalus), abnormal fetal affiliation, lack of water, polyhydramnios, immaturity of the fetal vestibular apparatus. With pelvic presentation of the structure of the brain, in particular oblongata, less mature than the head, even with full term pregnancy.

Placental factors include placenta previa and its location in the region of the bottom or angles of the uterus.

Diagnosis of pelvic presentation

Diagnosis is based on data from an external obstetric, vaginal, ultrasound study.

External obstetrical examination (four Leopold's maneuvres) allows to suspect a pelvic prescription.

At the ***first maneuver***, a round, dense, ballistic head, often offset from the midline of the abdomen to the right or to the left, is defined in the uterine fundus. The uterine base with pelvic presentations is higher than with cephalic

presentation, with the same term of pregnancy. This is due to the fact that the pelvic pole, in contrast to the head, is usually above the small pelvis orifice until the end of pregnancy and the beginning of labor.

At the ***second maneuver*** of an external obstetric research on a fetal back its position and type is determined.

At the ***third maneuver***, a large, irregularly shaped prepotent part of a softish consistency, not capable of balloting, is felt above or in the pelvic orifice.

The ***fourth maneuver*** allows you to clarify the nature of the presenting part and its relation to the entrance to the small pelvis. The pelvic end of the fetus, as a rule, is located high above the small pelvis outlet.

Heartbeats of the fetus with pelvic presentation is most clearly heard above the umbilicus, sometimes at its level, to the right or to the left (depending on the position).

At vaginal examination *during pregnancy* through the anterior arch, a bulky, soft consistency is felt by the presenting part of the fetus, which is denser and rounder in comparison with the head. During labor, vaginal examination helps to confirm the diagnosis as follows: with breech presentation, a bulky, soft part, ischial tuberosities, sacrum, intergluteal fold, anus, fetus genitalia. With the presentation, following the leg, you can feel the inguinal fold. With the mixed breech presentation, a foot may be palpated, lying with the buttocks. To mistakenly not take the foot for the fallen hand, we must remember that the foot has a heel bone, the fingers are even, short, the thumb is not detached and does not have great mobility. The thumb of the hand is easily pressed against the palm of your hand, you cannot press a thumb to the foot bottom.

Pelvic presentation is easily diagnosed with ultrasound, which allows to determine not only the pelvic presentation, but also its variant, the mass of the fetus, the position of the head (bent, unbent), the amount of water, etc.

US allocates four variants of position of a head of a fetus by the size of an angle between a backbone and a nape: when the sizes of an angle are more than 110° - the head is bent; from 100 to 110° - weak extension (I^{st} degree, “military posture”); from 90 to 100° - moderate extension (II^{nd} degree); less than 90° - excessive extension (III^{rd} degree, “looking at the stars”) (fig. 7.2).

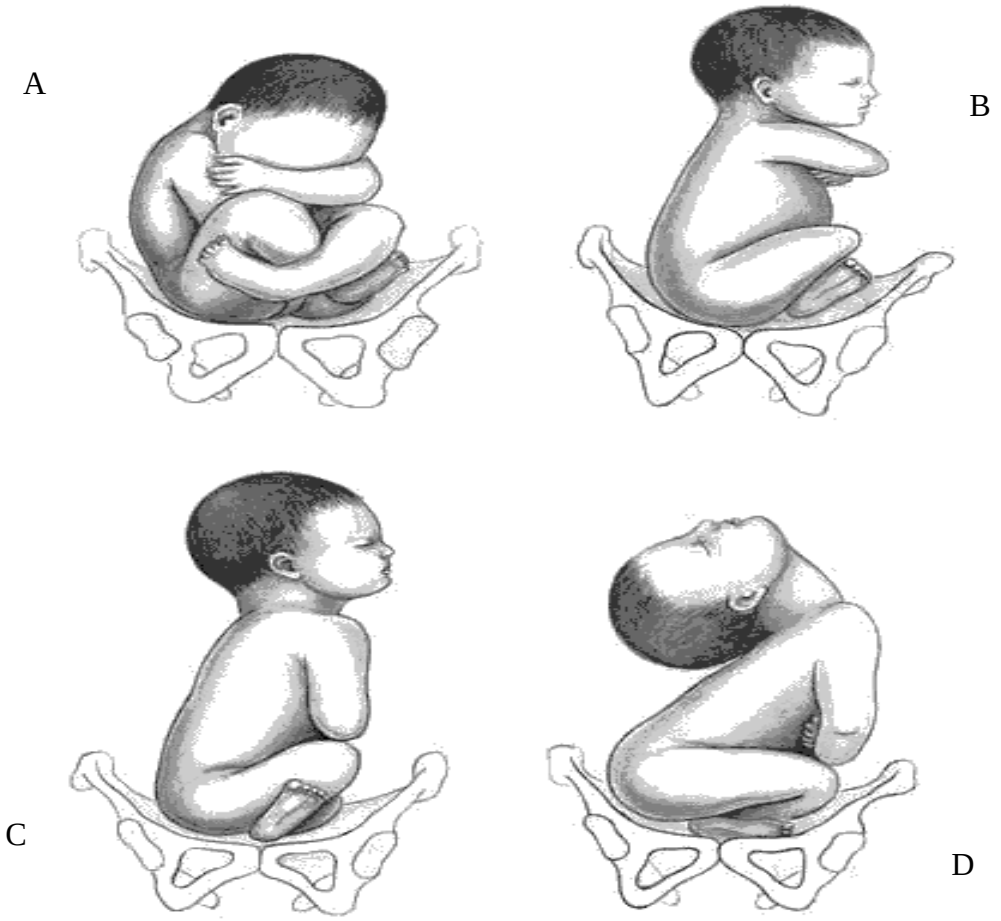


Fig. 7.2. Variants of the position of the fetal head in pelvic presentation:
A - the head is bent; B - I degree of extension ("military posture");
C - II degree of extension; D - III degree of extension ("looks at the stars")

With external obstetric examination, the extension of the fetal head can be suspected on the basis of the discrepancy between the size of the fetal head in the womb and the expected weight of the fetus, as well as the pronounced cervico-occipital sulcus. Excessive extension is extremely rare.

Biomechanism of childbirth with pelvic presentations.

Promotion of the fetus through the birth canal begins at the end of the first period of labor, after the outflow of amniotic fluid. At the beginning of labor, the buttocks are usually located in a transverse dimension (linea intertrochanterica) above one of the oblique or transverse dimensions of the entrance planes to the small pelvis.

In pelvic presentations, six moments of the delivery mechanism are distinguished (fig. 7.3).

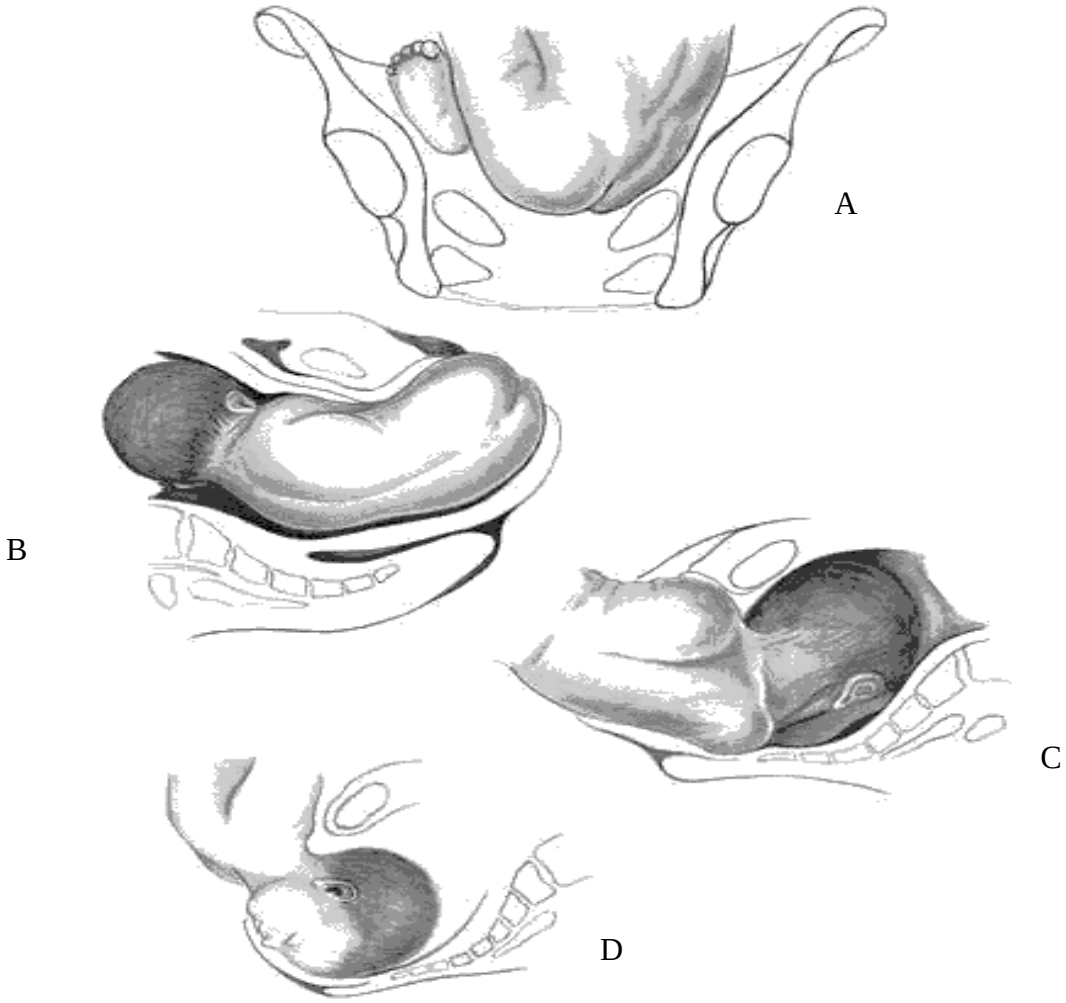


Fig. 7.3. Biomechanism of labor with pelvic presentation:
A - the inner turn of the buttocks (the first moment);
B - lateral flexion of the lumbar spine (second moment);
C - the internal turn of the shoulders and the outer turn of the trunk (the third moment);
D - flexion and birth of the head (sixth moment).

The first moment is the *internal turn of the buttocks*. It begins with the transition of the buttocks from the wide into the narrow part of the cavity of the small pelvis. The turn is made in such a way that in the pelvic outlet the transverse size of the buttocks is in the direct size of the pelvis.

The first is the buttock of the fetus, turned anteriorly. It fits under the pubic arch; a fixation point is formed between the lower edge of the lumbar articulation of the mother's pelvis and the iliac bone of the fetus facing the front.

The second point is the *lateral flexion of the lumbar part of the fetal spine*. Further forward movement leads to lateral flexion of the spine of the fetus. In this case, the buttocks, turned to the back, roll out over the perineum

and after it the buttocks, turned anteriorly, are finally born from under the pubic articulation. At this time, the shoulders enter their transverse size in the same oblique size of the entrance to the pelvis, through which the buttocks have passed, so that the frontal back rotates anteriorly.

The third point is the *internal turn of the shoulders and the outer turn of the trunk* (Figure 4). The turn is completed by setting the shoulders in the straight exit size. The frontal back rotates to the hip of the woman in childbirth in accordance with the position (at the first position - to the left hip, at the second position - to the right one). The shoulders of the fetus, facing the front (the border of the upper and middle third of the humerus), fits under the pubic arch, forming a fixation point. Shoulder, facing back, is located in front of the coccyx over the perineum.

After the fixation point is formed, as a result of *lateral flexion of the cervicothoracic part of the spine (**the fourth moment**)*, a thoracic girdle and hands are born. (fig. 7.4).

The fifth moment is *the internal turn of the head (normally back to the head)*. After the birth of the thoracic girdle, the head enters the oblique dimension of the area of the small pelvis outlet, oblique in size, opposite to that, in which the shoulders passed. When moving from the wide to the narrow part of the pelvis, the head makes an internal turn, as a result of which the sagittal (interparietal) suture appears in the direct exit size, and the suboccipitary fossa is under the pubic articulation where the fixation point is formed.

After the fixation point is formed, the head is bent (***the sixth moment***). The consequence of flexion is the birth of the head (fig. 7.4). chin, mouth, nose, crown and head are successively born over the perineum. More often the head is erupted in a small oblique size. Due to the rapid creation the configuration of the head does not occur, and it has a rounded shape.

Special aspects of leg presentation childbirth. At full leg presentation legs appear first from the vulvar slit, at incomplete presentation, as a rule, a leg facing the symphysis (fig. 7.4). When the legs or one leg is born by the popliteal fossa, the buttocks enter the entrance to the pelvis in one of the oblique dimensions, and in the future the delivery mechanism does not differ from that in the breech presentation.

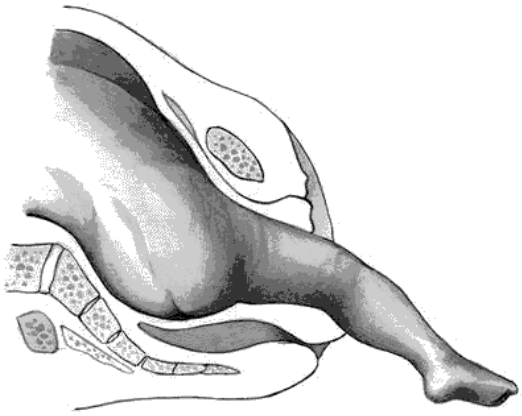


Fig. 7.4. Birth of the leg with incomplete leg presentation

Normally, the legs appear from the vulvar slit when the cervix is fully opened. However, the foot prolapse may occur with incomplete opening of the cervix, which is unfavorable for the fetus.

Deviations from the normal biomechanism of childbirth. When moving through the birth canal, the fetus may turn by the spine to posterior with a *posterior appearance* (fig. 7.5). When the head is bent at the time of its birth, the nose bridge rests on the symphysis, and the uterine cervix is rolled over the perineum. Head passage in the posterior appearance is slowed down.

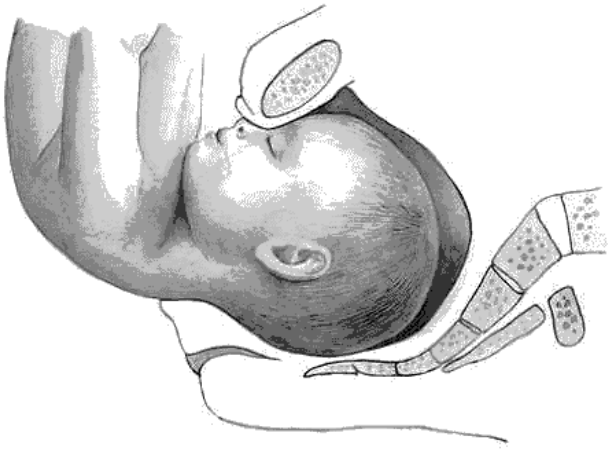


Fig. 7.5. The birth of the subsequent head in the occipitoposterior position

In the back view, there may be a serious complication - excessive extension (head lag) of the head (fig. 7.6). At the same time, the chin lingers over the symphysis. Birth of a head is impossible without providing manual handling.

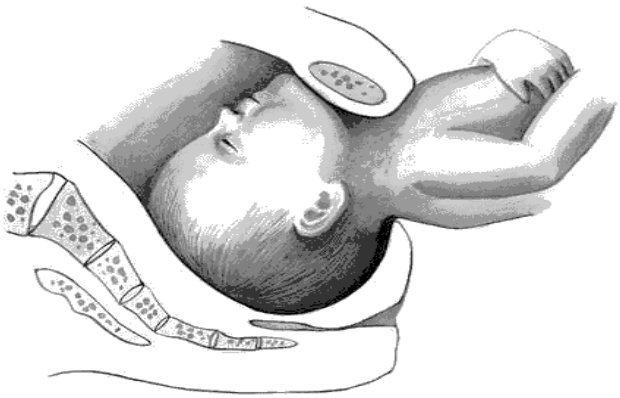


Fig. 7.6. Head lag in the back view of pelvic presentation

Hands' overturning. When the fetus moves, hands may lose their typical location, move away from the chest and stay in the uterus (fig. 7.7). Hands may be located in front of the face, on the sides of the head, overturned behind the back of the head (I, II and III degrees of tipping). Hands' overturning most often occurs when improper provision of manual handling and premature attempts to extract the fetus.

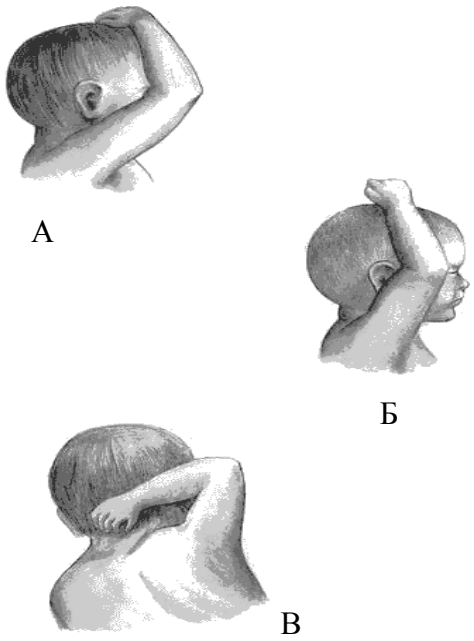


Fig. 7.7. Extension of arms: А - I degree; Б - II degree; В - III degree

When the delivery mechanism does not function properly the fetus cannot be born without assistance. This can often lead to death caused by asphyxia.

Specific features of pregnancy and childbirth

In the first half of pregnancy, a threat of interruption (45.9%), toxicosis (27.5%), and cervical insufficiency (9%) are often observed.

In the second half of pregnancy, a risk of premature labor (39.3%), fetal growth restriction (5.3%), and water scarcity (5.3%) are more likely to occur than in case of cephalic presentation.

Childbirth complications. The most frequent complication in case of the frank breech, flexed breach and especially footling presentation is *untimely* (premature or early) *outpouring of amniotic fluid*. This complication is caused by the absence of close contact between the presenting part and the birth canal, as a result of which there is no division into fore and hind waters. At each contraction, the amniotic fluid moves to the lower part of the uterus, exerting great pressure on the amniotic membranes, thus facilitating their rupture. When the rupture to delivery interval is too long it may cause infection of the membranes, placenta, uterus and fetus.

The prolapse of the umbilical cord loops and small parts of the fetus (fig. 7.8) can occur during the outflow of amniotic fluid. In case of a tight contact belt, when the pelvic pole is inserted into the pelvis, there is a likelihood of umbilical cord compression, which may lead to hypoxia and fetal death.

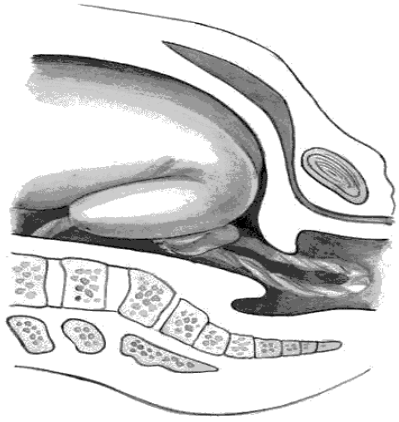


Fig. 7.8. Flexed breech presentation. Umbilical cord prolapse

Primary and secondary weakness of labor develops in case of a breech presentation 2-3 times more often than in a cephalic presentation and is caused both by the functional inferiority of the uterus and by absence of pressure on the dense lower uterine segment. The weakness of labor is usually combined with untimely discharge of amniotic fluid. Disclosure of the cervix is slow. The pelvic pole remains for a long time above the pelvic inlet.

During *fetus expulsion*, there are several aspects which may lead to pathological delivery in a breech presentation. One of them is that the largest and densest part of the fetus - the head - is born last. *The pelvic pole*, which *leads the way through the birth canal,* is less bulky and cannot expand the birth canal to the extent necessary for a smooth passage of the shoulders and head. When the shoulders are entering the pelvis, the head may have difficulty moving through the birth canal.

When the fetus is born in a breech presentation, the umbilical cord is inevitably *compressed* by the head. The umbilical cord's compression starts at the moment when the baby is born up to the navel and the head enters the pelvis. If the birth of the body and head is delayed by 3-5 minutes, it may cause fetal hypoxia, which can lead to death.

One of the complications occurs when the baby's buttocks are wedged in the mother's pelvis in a breech presentation. This often results from a clinical mismatch between the size of the fetus and the mother's pelvis.

Management ofbreech pregnancy and birth

Pregnant women with a breech presentation up to 28-30 weeks only need a wait-and-see management, since in the majority of cases (70% of multiparas and 30% of primiparas) the **baby** spontaneously **turns** into **head**-down position. Starting from the 30th week, women are recommended physical exercises aimed at helping turn a **breech baby** to **head** first presentation (***g*ymnastics based on *the method of*** **Dikan**): a pregnant woman, lying on the bed, turns alternately on the right and left sides and lies on each for 10 minutes. The procedure is repeated 3-4 times thrice a day. Rotation of the fetal head can occur during the 1st week.

The exercises tone the muscles of the anterior abdominal wall and uterus as a result of irritation of the uterine baroreceptors. At the same time, the fetal vestibular apparatus is irritated.

The presentation may be changed with the help of ***external preventive cephalic version*** to head first position using ultrasound. Currently, it is recommended at 38 weeks in a hospital setting, taking into account contraindications and complications. For the external cephalic version, b-mimetics are always used to reduce the uterine tone and cardiomonitoring of the fetus is conducted before and within 1 hour after the procedure.

The method of delivery in a breech presentation should be determined before the birth. Therefore, pregnant women with breech babies should be

hospitalized at 39 weeks. The hospital should be provided with well-trained personnel, equipped with modern equipment and have round-the-clock anesthesia and resuscitation services.

Babies in a breech position may be delivered by **C-section** and vaginally.

The choice of the delivery method in case of a breech presentation is determined by the age, parity, somatic and obstetric anamnesis, pregnancy length, the readiness of the female organism for childbirth, the pelvis size, the integrity of the fetal bladder, the type of breech presentation of the fetus, the position of its head, the state and mass of the fetus.

Because of complications that may arise during natural delivery of breech babies the majority of obstetricians expand indications for cesarean section. The frequency of C-section in different clinics varies from 50 to 90-100%.

Indications for caesarean section during pregnancy are:

• being over 30 years old;

• extragenital diseases that rule out labor;

• malformation of internal genitalia;

• pregnancy after IVF, especially after several attempts;

• contracted pelvis;

• uterinescar after cesarean section and conservative myomectomy;

• estimated fetus weight being over 3600g;

• overdue pregnancy;

• signs of fetal hypoxia shown by cardiotocography;

• infringement of blood circulation in the mother-placenta-fetus system shown by Doppler velocimetry;

• hemolytic disease of the fetus;

• III degree extension of the fetal head as indicated by an ultrasound scan;

• breech presentation of the first fetus during multiple pregnancy;

• additional indications for urgent pregnancy termination;

• the patient’s insistence.

Primiparas aged 30 and older will most likely demonstrate labor weakness, often secondary in the second stage of labor, when intensive contractions of the uterus are necessary to expel the fetus.

The importance of parity in case of a breech presentation is determined by the fact that the reproductive tissues of the birth canal create less obstacles to the passage of the fetus due to stretching during the first delivery.

Assessment of ***the size and shape of the small pelvis*** is of great significance in case of a breech presentation of the fetus. Even a slight decrease in one of the pelvic dimensions can lead to fetal injury during childbirth, because the fetal head does not have enough time to adapt to the mother's pelvis. Objective evaluation of the measurements and shape of the bone pelvis can be obtained with the help of X-ray pelvimetry.

An important sign that helps predict the nature of labor is ***cervical maturity*** determined by the Bishop score and ultrasound. "Immature" cervix in a full-term pregnancy, especially with premature discharge of amniotic fluid, suggests labor weakness, which is unfavorable for breech births.

During delivery, ***the fetal weight*** is taken into account. It has been established that the lowest mortality in a breech presentation is observed when the fetal weight ranges from 2000 to 3500 grams. For pelvic presentation in primiparas, a fetus weighing more than 3600-3800 grams is considered to be large.

A serious complication during the birth of the head is its ***excessive extension (III degree),*** which makes it difficult to pass through the planes of the small pelvis, creating conditions for injuries to the brain and spinal cord.

The condition of the fetus is important for determining the method of delivery. Chronic fetal hypoxia, delayed fetal growth require careful delivery, as complications during childbirth worsen the fetal condition. Pregnancy complications leading to fetal hypoxia (overdue pregnancy, hemolytic disease of the fetus, etc.) should be taken into consideration.

Full-term pregnancy, the normal size of the pelvis, the medium size of the fetus, bent or slightly extended head, "mature" cervix, frank breech presentation in a primipara, frank breech or flexed breech presentation in a multipara allow to carry out delivery through the natural birth canal. In the course of childbirth, the mother and/or fetus may develop complications. This requires operative delivery (*emergency cesarean section or, in extremely rare cases, extraction of the fetus by the pelvic pole*).

Delivery through the natural passages

When conducting delivery through the natural birth canal in the ***first stage of labor*** it is necessary to do the following:

• clarify the nature of the presentation,

• prevent early discharge of amniotic fluid and prolapse of umbilical cord loops,

• monitor the fetus and the development of labor,

• relieve the pain of the contractions.

To *prevent early rupture of the amniotic fluid sac*, the prolapse of the umbilical cord loops, a pregnant woman is recommended bed rest. It is better to lie on the side where the baby has its back. This helps induce labor and facilitates correct insertion of the presenting part.

After the outflow of amniotic fluid, *a vaginal examination is necessary* to clarify the diagnosis and rule out the umbilical cord prolapse.

In case of the umbilical cord prolapse and absence of conditions for rapid delivery through the natural birth canal, a cesarean section is performed.

At the onset of labor, if the amniotic fluid sac is intact, a wait-and-see approach should be used. If there is no possibility of an ultrasound examination, external manual procedures should be used and *the nature of the presenting part should be clarified* during a vaginal examination. During the vaginal examination, in case of the frank breech presentation, the part of the fetus with softish consistency is palpated, the sacrum, the coccyx, the sitting bones, the gap between the buttocks, the anal orifice, the reproductive organs of the fetus, the inguinal fold are identified. The location of the sacrum helps determine the position of the fetus: the sacroanterior position of the breech means that the sacrum faces anteriorly and towards the left, while in the sacroposterior position the sacrum faces posteriorly and towards the right. In a flexed breech presentation a foot may be felt near the buttocks. In a footling presentation, the feet of the fetus may be identified, as well as the buttocks over them.

In a footling presentation, the calcaneal tuberosity, short and even fingers, absence of the thumb abduction make it possible to distinguish a leg from a hand of the fetus. The knee, in contrast to the elbow, has a movable patella.

The possibility of determining the presenting part increases after the outflow of amniotic fluid.

In the process of *monitoring the cardiac activity* of the fetus, it is necessary to take into account its specific features related to the compression of the abdomen with the legs of the fetus and irritation of *n. splanchnicus*, which leads to tachycardia, especially at the end of the first and second stages of labor. During cardiac monitoring, in addition to the high basal heart rate (BHR), there are often accelerations in response to a contraction and early decelerations during labor. *The initial signs of fetal hypoxia* in the first stage of childbirth

include tachycardia (BHR 175-190 per minute) or bradycardia (BHR up to 100 per minute), intermittent short-term arrhythmia or monotony of the rhythm; in the second stage of labor - a reduction in BHR to 80 per minute, periodic monotony of the rhythm in combination with arrhythmia. *Significant signs of hypoxia* in the first stage of labor include tachycardia up to 200 per minute or bradycardia up to 80 per minute, persistent monotony of the rhythm or arrhythmia, long periods of delayed decrease in heart rate. In the second stage of labor - tachycardia over 200 per minute or bradycardia below 80 per minute, persistent arrhythmia in combination with monotony or an extended period of delayed decrease in heart rate.

Assessment of labor is carried out with the help of tocography and maintenance of a partograph. In the normal course of labor, the rate of opening of the cervix into the active stage of labor in a breech presentation should be at least 1.2 cm/h in primiparas and at least 1.5 cm/h in multiparas.

The use of tocography and partographs allows for a timely diagnosis of abnormalities of labor and change of the labor tactics.

In case of painful contractions and established labor, *anesthesia* is advisable. For this purpose, analgesics (promedol), antispasmodics (no-spa, papaverine, buscopan), epidural anesthesia are used. With epidural anesthesia, prophylactic administration of oxytocin in small doses is possible in order to avoid the development of labor weakness.

In *the second stage of labor*, it is necessary to conduct careful observation of the fetal condition (cardiomonitoring), its passage through the birth canal. In case of normal labor, fetal movement through the birth canal until the buttocks emerge there is no need to interfere with the birth process.

During expulsion of the fetus in a breech presentation, unlike head first presentation, appearance of meconium is not a sign of hypoxia, since it is mechanically squeezed out of the bowels during passage through the birth canal.

For preventive purposes, at the end of the first and beginning of the second stage, oxytocin may be administered intravenously. At the end of the second stage, when the buttocks emerge, 1.0 ml of 0.1% solution of atropine sulfate or other antispasmodics are injected intravenously to prevent cervical spasm and head entrapment, and episiotomy or perineotomy are performed.

After emergence of the buttocks, to provide support it is useful to distinguish four stages of the birth of the fetus: up to the navel; from the navel to the inferior angle of the scapula; shoulder girdle and hands; head.

The critical moment comes after the birth of the fetus to the navel. From that moment on, ***firstly,*** the umbilical cord gets stretched and compressed by the head which has entered the pelvis, therefore, the expulsion of the shoulder girdle and head should occur within the next 3-5 minutes. A delay in the delivery of the fetus for more than 5-6 minutes can cause the development of acute hypoxia and antenatal fetal death. ***Secondly,*** when the head enters the pelvic cavity and the uterine volume decreases, premature placental abruption and acute fetal hypoxia are possible.

If in the process of delivery of the fetus the umbilical cord gets significantly stretched, preventing the passage of the trunk and head, the cord can be cut between the two clamps to accelerate the birth of the baby.

In order for labor in a beech presentation to end favorably for the mother and the baby, during the second stage ***manual assistance, depending on the type of pelvic presentation***, should be provided.

In case of a frank breech presentation, the most widely used manual handling method in our country is the one developed by N.A. Tsovyanov (1929), as well as the Mauriceau-Levret-Lachapelle method for the delivery of the after-coming fetal head.

Tsovyanov's maneuver for frank breech presentation: The purpose of this manual aid is to maintain the normal attitude of the fetus. During delivery, it is necessary to keep the legs outstretched and pressed against the fetal body. The legs help keep the crossed arms pressed to the chest and prevent them from extending up and back, and the feet, located at the level of the face, keep the head bent. The legs, extended along the body, transform the fetal body into a cone, which gradually expands upward. At the level of the shoulder girdle, it reaches maximum circumference (averagely, 42 cm), which is a combination of the circumference of the chest, both arms crossed on the chest and the legs pressed to them. All this exceeds the circumference of the after-coming head (32-34 cm), so it delivers easily.

The techniques of Tsovyanov's manual aid in a frank breech presentation. The assistance is given after the emergence of the buttocks in the direct diameter of the pelvic outlet, when they pass or have already passed into

one of its oblique diameters. The thumbs are placed on the hips of the fetus, on their back surface, and are gently pressed to the trunk, while the remaining four fingers are placed on the surface of the sacrum (fig. 7.9). As the pelvic pole of the fetus is delivered, the hands, moving along the fetal body, are constantly kept on the mother's perineum. At the same time, one should not pull on the fetus, as this may cause excessive extension of the arms and the head.

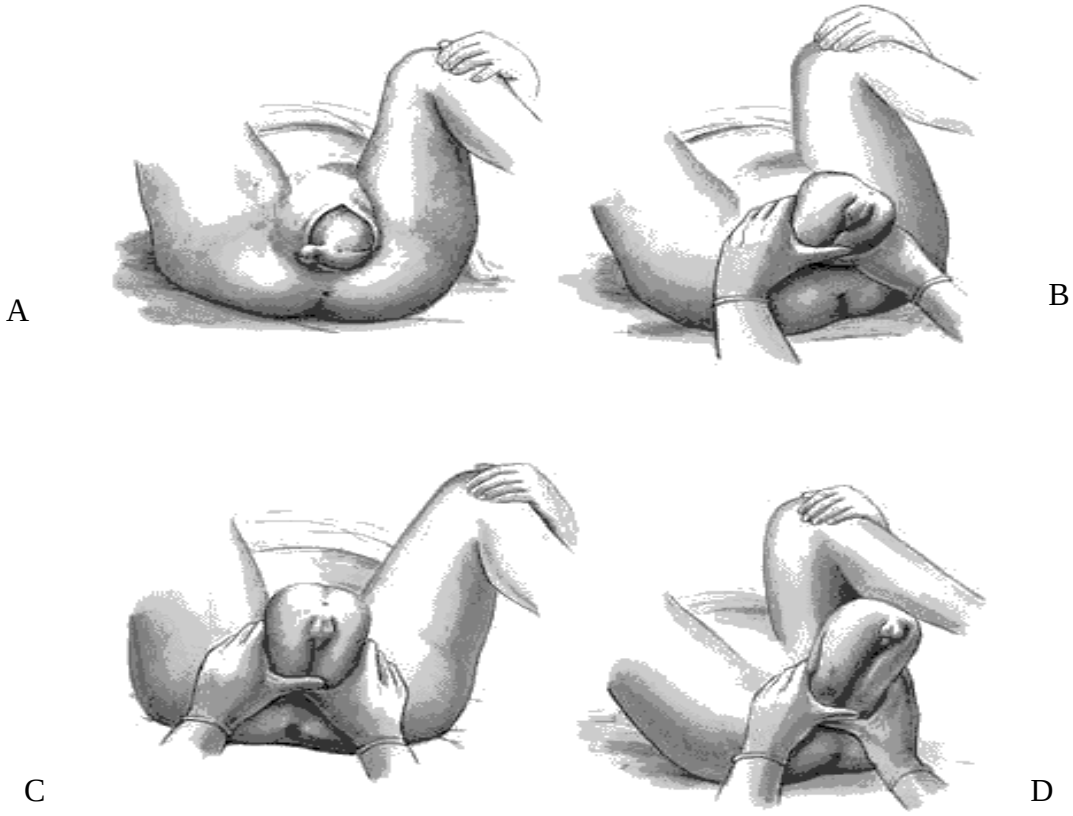


Fig. 7.9. Tsovyanov's maneuver in a frank breech presentation:
A - after the delivery of the anterior buttock, the position of the fetus is specified;
B – the torso of the fetus enters the left oblique diameter of the pelvis;
C – the torso of the fetus enters the transverse diameter of the pelvis with its back turned anteriorly;
D - the thumbs of the obstetrician, as delivery progresses, move along the back of the thighs towards the posterior vaginal wall

When using the Tsovyanov's method, to avoid the sacroposterior position, the body is held with its back turned anteriorly.

If labor goes well, the fetus is quickly born to the navel, then the body gradually enters the oblique diameter and at the time of the delivery to the

inferior angle of the scapula the body is again established in the conjugate diameter. The shoulder facing anteriorly fits under the pubic arch.

For the delivery of the hand facing posteriorly the fetus is lifted anteriorly (towards the mother's abdomen). At the same time, the back hand is born from the hollow of the sacrum and the legs usually fall out. After that, from the depth of the gaping labiathe chin, mouth and nose of the fetus emerge. To release the head, it is sufficient to direct the buttocks towards oneself and anteriorly. The head is delivered without any additional intervention.

When providing manual aid, to keep the head bent, the attendant gently presses it through the front abdominal wall in such a way that the hand is constantly in contact with the descending head.

Tsovyanov's maneuver for a footling presentation. In a footling presentation, complications are more frequent than during breech births. The complications are related to the fact that the legs are not able to prepare the birth canal for the subsequent passage of the shoulder girdle and head. In a footling presentation, except for classic complications (extending of the arms along the head, extending of the head backward), entrapment of the head may occur as a result of incomplete opening of the cervix or its convulsive contraction. These complications can be prevented if, at the time of the expulsion of large parts of the fetus, the cervix of the uterus will be fully opened. For this purpose, the legs are kept in the vagina until the cervix is fully opened.

In case of the diagnosis of a footling presentation and the decision in favor of the natural birth, careful monitoring of the condition of the pregnant woman and fetus is maintained. When the heels of the fetus appear in the area of the vulva, they are covered with a sterile napkin and the doctor puts up resistance to the delivery of the feet with his palm applied to the external genital organs (fig. 7.10).

As the buttocks move and descend into the vagina, along with the feet located there, a flexed breech presentation is formed.

Resistance to the delivery of the feet should be put up until the full opening of the mouth of the womb occurs, as indicated by the pronounced protrusion of the perineum by the presenting part and the anal gaping. When the buttocks descend to the vulvar vestibule, the feet begin to protrude from under the sides of the attendant's palm, despite the resistance. After this, the feet are born easily, along with the buttocks and the trunk, to the angle of the scapula.

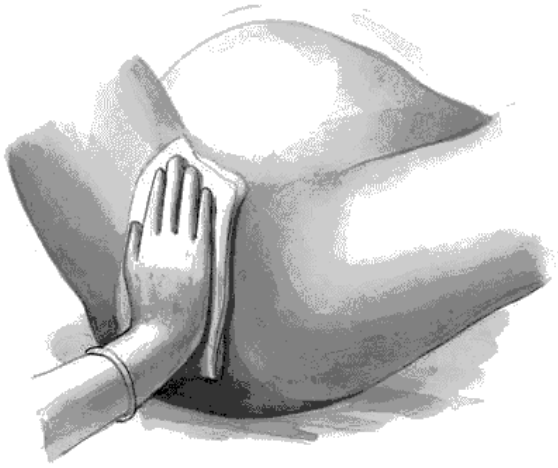


Fig. 7.10. Resistance to the delivery of the feet infootling presentation

If, despite the aid in a breech presentation, the delivery of the shoulder girdle, arms and head is delayed, the classical manual handling technique for a breech presentation is used (see below).

These manipulations are also used when the arms are extended along the head and difficulties arise during their delivery, as well as or when the head is excessively extended.

While applying Tzovyanov's method, in the absence of indications for rapid fetal extraction, all manipulations should be performed slowly, without pulling on the body and deflecting it anteriorly, which is especially important during the delivery of the head. Deviation of the torso anteriorly before the formation of a fixation point between the lower edge of the pubic articulation and the suboccipital fossa can lead not only to its extension, but also cause damage to the muscles of the neck, vertebral arteries, cervical spine, and spinal cord.

During a breech birth, it may be necessary to provide *classical manual aid*.

CLASSIC MANUAL AID IN BREECH PRESENTATION

Classic manual aid methods in a breech presentation involve assisted delivery of the arms and head in the second stage of labor.

The indication for manual assistance is a delay in the delivery of the arms and the head, which is located in the cavity of the lesser pelvis. If after the birth

of the trunk to the inferior corners of the scapula the baby was not born within 2-3 minutes, it is necessary to resort to manual maneuvers.

Methodology. At first the arms are released and, afterwards, the fetal head. The arms are released after the delivery of the body to the angle of the scapula turned posteriorly. The arm facing posteriorly (towards the perineum) is the first to be released, since this is the only part of the birth canal where the attendant can insert his hand and reach the elbow fold of the fetal arm. (fig. 7.11).

• Each arm of the fetus is released by the same hand of the attendant - the right arm - by the right, the left arm – by the left.

• The arm facing backwards is always released first.

• To release the front-facing arm, the fetal torso is rotated, so that the second handle is on the side of the perineum.

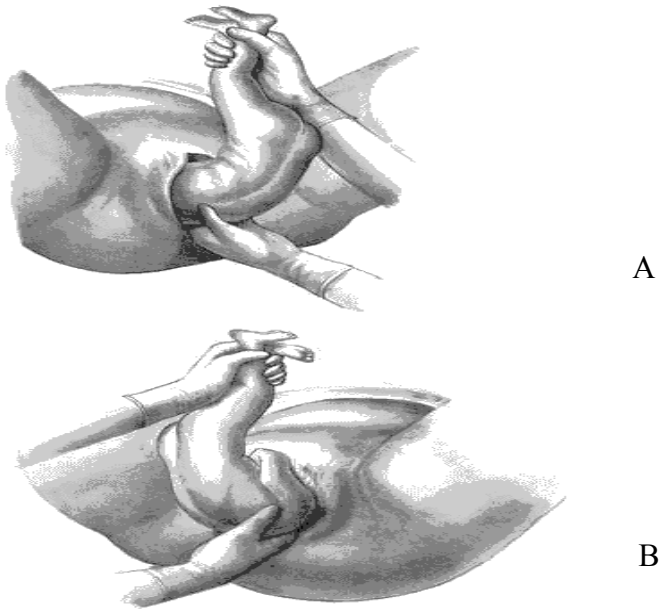


Fig. 7.11. Manual aid in breech presentation:
A - release of the lower left arm. The trunk of the fetus is turned towards the mother's groin in the opposite direction;
B - Release of the second (right) arm after rotating the torso 180°

The arms are released when the fetal body is located in the conjugate diameter. In the first position, the legs are taken by the ankle joints with the left hand (see fig. 7.12) and the body of the fetus is placed parallel to the right inguinal fold of the mother. The right hand is inserted into the birth canal on the side of the perineum and reaches the elbow fold of the fetal arm. The arm is extracted with a washing motion (in front of the fetal face). At the same time,

strong pressure on the humerus and forearm should be avoided due to the risk of damage. The arm facing anteriorly sometimes is delivered without assistance. If this does not happen, the fetus should be rotated 180°, so that the arm faces the perineum. To do this, the fetal chest is taken with two hands (with the thumbs located on the back) and the fetus is gently turned, so that the back passes under the womb. In order to facilitate this complex movement, the fetus should be slightly pushed up into the uterus. To release the second arm, the body of the fetus is again placed in a position parallel to the maternal inguinal fold, and the arm is pulled out by the elbow fold in front of the fetal face (washing motion).

After the arms *the head is released*. During extraction, the head must perform the same movements in the pelvic cavity as in spontaneous labor: flexion, internal rotation and then be fixed by the suboccipital fossa under the womb, so that during the flexion the chin and then the face with the hairy part of head would be delivered. In the process of extracting the head, it is important to properly grip it and make the pulling movements strictly in the direction of the axis pelvis plane (fig. 7.12).

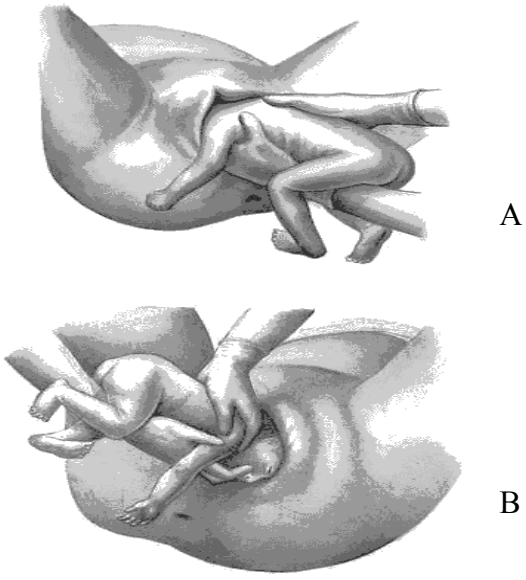


Fig. 7.12. Release of the after-coming head using the method of Mauriceau-Levret-Lachapelle:
A - the trunk of the fetus is placed astride the forearm of the attendant, the second hand is placed on the shoulders of the fetus;
B – the II or III finger is inserted into the fetal mouth; the head is pulled out according to the mechanism of labor

The head is most often grasped in accordance with the Mauriceau-Levret-Lachapelle method. The torso of the fetus is located on the forearm of the

attendant’s left hand, the II and III fingers of this hand are placed on the upper jaw of the fetus, helping the head to bend. Sometimes the II finger is inserted into the mouth to cause the head to bend by pressing the lower jaw. The II and IV fingers of the right hand are placed on the fetal shoulders and the III - on the back of the head, which causes the head to bend.

The tractions are performed in the direction of the axis pelvis plane, following the turn of the head, which by the end of the expulsion is located in the conjugate diameter of the pelvis. If the head is located in the wide part of the lesser pelvis, the tractions are carried out obliquely rearwards, downwards and anteriorly, while if the head is in the narrow part of the pelvic cavity - downwards and anteriorly. While the head is being extracted, the attendant holds the bottom of the uterus, preventing excessive extension of the head (fig. 7.13).

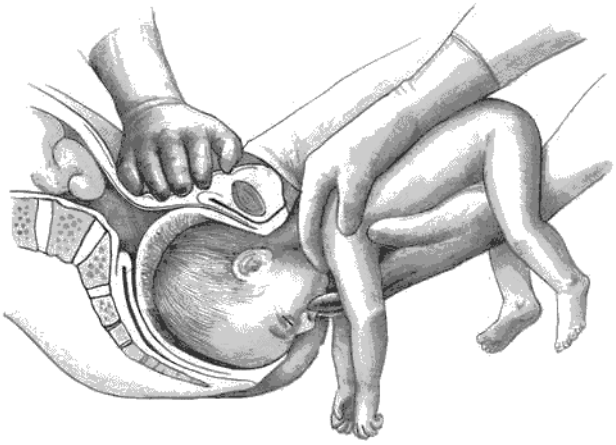


Fig. 7.13. The attendant helps extract the head,
exerting pressure on it from above through the abdominal wall

While assisting breech deliveries, it is necessary to make sure that the fetal back rotates anteriorly, since the rotation rearwards may cause complications related to the delivery of the head.

Due to a large number of complications for the fetus and newborn in a breech presentation, a cesarean section is often considered during labor. Indications for emergency caesarean section in labor are:

- discharge of amniotic fluid as a result of the unprepared cervix;
- footling presentation of the fetus;
- anomalies of labor (weakness, discoordination);
- signs of fetal hypoxia according to cardiomonitoring data;

• presentation or prolapse of umbilical cord loops in the first stage of labor.

The location of the pelvic pole of the fetus in the wide part of the lesser pelvis cavity is not an obstacle to cesarean section.

The course and management of the third stage of labor do not differ from those in a cephalic presentation.

The postpartum period goes well for most women, but postpartum diseases are observed more often than in a cephalic presentation. This is caused by more frequent damage to the soft birth canal due to the use of assistance and surgical interventions in a breech birth.

Test questions and sample answers:

1. What is called breech presentation of the fetus?

Sample answer: Breech presentation (praesentatiopelvica) is a presentation in which the presenting part is the buttocks and/or the legs/leg of the fetus.

2. What are the reasons for a breech presentation?

Sample answer:

a) increased mobility of the fetus;

b) limited mobility of the fetus;

c) decrease in the tone of the uterus and the excitability of its neuromuscular apparatus;

d) placenta previa;

e) malformations of the fetus.

3. What are the main types of breech presentation?

Sample answer:

a) frank breech (flexed type)

b) footling breech (extended type)

4. What is the classification of breech presentations?

Sample answer:

a) frank breech;

b) flexed breech.

5. What is the classification of footling presentations?

Sample answer:

a) complete;

b) incomplete;

c) knee presentation.

6. What are the criteria for diagnosing a frank breech presentation during a vaginal examination?

Sample answer:

a) bulky soft part of the fetus;

b) ischial tuberosity;

c) gluteal crease;

d) anal orifice;

e) fetal genitalia

e) inguinal fold.

7. What additional research methods are used to diagnose a breech presentations?

Sample answer:

a) ultrasound scanning.

8. What moments of the labor biomechanism in a breech presentation do you know?

Sample answer:

a) The first moment is inward turn of the buttocks;

b) The second moment is lateral flexion of the lumbar part of the fetal spine;

c) The third moment is inward turn of the shoulders and outward turn of the torso;

d) The fourth moment is lateral flexion of the cervicothoracic part of the spine;

e) The fifth moment is internal rotation of the head;

g) The sixth moment is bending of the head.

9. What are possible complications for a woman in the second and third stages of labor in a breech presentation?

Sample answer:

a) weakness of labor;

b) cervical spasm;

c) rupture of the perineum and uterine cervix;

d) bleeding in the postpartum and early postpartum periods.

10. What are possible complications for a fetus born in a breech presentation in the period of expulsion?

Sample answer:

a) extension of the arms along the head;

b) untimely extension of the head;

c) entrapment of the head;

d) intrauterine death.

11. What are the degrees of extension of fetal arms?

Sample answer:

a) I - one or both arms are on the fetal face;

b) II - one or both arms are near the temporal bone;

c) III - one or both arms are behind the back of the head.

12. What is the purpose of Tsovyanov's manual aid method in a frank breech presentation?

Sample answer: preserve the flexed type of the fetal attitude.

13. What is the purpose of Tsovyanov's manual aid method in a footling presentation?

Sample answer:

a) turn a footling presentation into a flexed breech presentation;

b) facilitate full disclosure of the cervix.

14. What are the stages of birth of the trunk in a breech presentations?

Sample answer:

a) delivery to the navel;

b) delivery from the navel to the inferior angle of the scapula;

c) delivery of the shoulder girdle and arms;

d) delivery of the fetal head.

15. Give a definition of the classic manual aid in a breech presentation.

Sample answer: a set of maneuvers aimed at the release of the arms and the head of the fetus born in a breech presentation.

A student should know:

1. Definition of the concept "Breech presentation of the fetus."
2. Frequency of breech presentations.
3. Reasons for breech presentations.
4. Classification of breech presentations.
5. Diagnosis of breech presentations based on the data of external and internal obstetric examination.
6. Additional methods of breech presentations diagnosis.
7. The course and management of pregnancy in a breech presentation.
8. Key moments of the biomechanism of labor in breech presentations.
9. Axis point, insertion points, circumferences erupting the pelvic pole, shoulder girdle and the fetal head with pelvic presentations
10. Possible complications in the I stage of labor, their prevention.
11. Possible complications in the II period of labor, their prevention.
12. Tsyovyanov‘s manual aid for a frank breech presentation, its purpose and methodology.
13. Tsyovyanov‘s manual aid for a footling presentation, its purpose and methodology.
14. Classic manual aid, its purpose, techniques.
15. Methods for releasing the head with the help of the classic manual aid method.
16. Possible complications while using classic manual aid method.
17. Degrees of arms extension.
18. The outcome of labor for the mother and fetus in a breech presentation.
19. Long-term consequences for the fetus born in a breech presentation.
20. Antenatal correction of a breech presentation.

A student must be able to:

1. Diagnose a breech presentation during an external obstetric examination.

2. Recognize a breech presentation on a phantom.

3. Use Tsovyanov’s manual aid method in a frank breech and footling presentation on a phantom.

4. Use the classic manual aid method on a phantom.

5. Perform Dikan gymnastics.

6. Conduct external preventive rotation to the head according to Arkhangelskiy’s method.

7. Write prescriptions for atropine, no-spa, papaverine, halidor, oxytocin.

Questions for the independent work of students:

1. Complications of pregnancy and delivery in a breech presentation of the fetus.

2. The role of chronic fetoplacental insufficiency in the formation of a breech presentation.

3. Optimal methods of breech delivery for pregnant women with extragenital pathology.

4. Specific features of managing preterm labor in a breech presentation.

5. Twin pregnancy: a breech presentation of one of the fetuses.

Topic 8
CONTRACTED PELVISES IN THE MODERN OBSTETRICS. THE CLINICALLY CONTRACTED PELVIS (THE CEPHALOPELVIC DISPROPORTION)

The goal of the class:

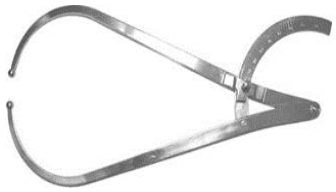
To study the classification and anatomic features of common and uncommon forms of the contracted pelvis, to master diagnostic techniques of anatomically and clinically contracted pelvises of varying contraction and inequality ratio; the biomechanism of labor in case of the generally contracted, dollichopellic, flat rachitic and simple flat pelvis, features of the labor management with varying forms and contraction ratio of the pelvis. The clinically contracted pelvis, seeds, the classification, labor methods.

The place of the class:

The pathologic pregnancy department, the predelivery room, the labor ward, the classroom, the simulation class.

Reference materials:

The female pelvis, the pelvimeter, the doll, training models, tables.



Подвздошная кость	The iliac bone
Крестец	The sacral bone
Копчик	The tail bone
Большая седалищная вырезка	The greater sciatic notch
Подвздошная бугристость	The iliac tuberosity
Подвздошный гребень	The iliac crest
Седалищный бугор	The ischial tuberosity
Лобковой симфиз (симфизиальная поверхность)	The pubic symphysis (the sumphysial surface of the pubis)
Седалищная кость	The ischial bone
Лобковая кость	The pubic bone
Вертлужная впадина	The cup-like cavity

The subject matter of the class:

The pelvis is considered as the **anatomically contracted one** if any one or more of its sizes is decreased by 1,5-2 cm in comparison with the normal value. The true conjugate size is commonly believed as the key indicator of the pelvis contraction. If its size is less than 11 cm, the pelvis will be considered as the contracted one.

The clinically (functionally) contracted pelvis is the pelvis with **the inconsistency** between sizes of the fetus and the pelvis of the gravida identified notwithstanding sizes of the latest.

The rational labor management in case of the contracted pelvis is relating to the most complicated sections of the practical obstetrics. Of the one part it relates to the predominance of defined forms of the anatomically contracted pelvis in the modern context and of the other part to the inadequate attention of doctors to the appearance of signs of the functionally contracted pelvis during the labor. According to the data of varying authors the occurrence frequency of the anatomically contracted pelvis varies widely (from 2,6 to 15-23 %).

FACTORS CONDUCIVE TO THE CONTRACTED PELVIS FORMATION:

1. The undernutrition at the early age.
2. Common acute and chronic diseases at the early and the puberty age.

3. The following diseases lead to the pelvis deformation: the rachitis, the infantile cerebral paralysis (ICP), the poliomyelitis, tumors, the tuberculosis.

4. Pelvis abnormalities as the result of the spinal deformity: the cyphosis, the scoliosis, the tail bone deformation, inheritable pelvis abnormalities.

5. The deformation of lower limbs: diseases and the dislocation of hip joints, the atrophy and the absence.

6. The pelvis deformation as the result of injuries: car accidents, earthquakes and etc.

7. Menstrual function disorders.

8. The hyperandrogenism.

9. The ovarian dysfunction.

10. The infertility + the habitual non-carrying of the pregnancy are often associated with anatomically contracted pelvises.

11. Excessive psychophysical at the puberty age.

Features of the female pelvis in the modern obstetrics:

1. Roughly deformed pelvises are almost **impractical**.

2. The pelvis with the catastrophic (III-IV) contraction ratio is exceedingly rear in occurrence.

3. The balance of the most commonly occurring forms of the pelvis changed. Over the course of the century the frequency of the occurrence of the simple flat pelvis dropped by the factor of 10. At the same time **the dollichopellic pelvis became of the more frequent occurrence.**

4. **Obliterated forms** of the contracted pelvis **became prevalent**. They are identified only on the sound judgement of the internal pelvis surface and using specific examination methods (the radiopelvimetry, the magnetic resonance imaging (MRI)).

These forms include but not limited to the assimilation or the so-called «long» pelvis, the spondylolisthetic pelvis, the pelvis with the reduction of the conjugate diameter of the broad pelvic cavity, the pelvis of female athletes.

5. **Large-size unborn babies become more and more frequent phenomenon**. As the result there is a necessity in the more diligent approach to the assessment of sizes and the weight of the fetus.

The classification

In the last 50 years the following classification based on the **assessment of the form and the contraction ratio of the pelvis** got widespread in our country.

The classification based on pelvis contraction forms

A. Commonly occurring forms of the contracted pelvis (95,6%)

1) the dollichopellic pelvis (45,2%);

2) the flat pelvis: the simple flat pelvis – the Deventer's pelvis (13,6%), the flat rachitic pelvis (6,5%), the pelvis with the reduction of the conjugate diameter of the broad pelvic cavity (21,8%));

3) the general uniformly contracted pelvis (8,5%).

B. Uncommonly occurring forms of the contracted pelvis (4,4 %)

1) the coxalgic and the obliquely oval contracted pelvis;

2) the pelvic contracted by the extosis, the osseous growth because of the pelvis displaced fracture;

3) other forms of the pelvis (the assimilated, funnel-shaped, kyphotic, osteomalacic, spondylolisthetic, inverted or open fronted pelvis).

4) the pelvis contracted because of tumors of the ootheca, the uterus partially or fully located in the small pelvis cavity.

The Palmov's classification of anatomically contracted pelvises by the contraction ratio.

I ratio: the true conjugate 10,5-9,1 cm (96,8%);

II ratio: 9,0-7,6 cm (3,18%);

III ratio: 7,5-6,6 cm (0,02%);

IV ratio: less than 6,5 cm (0,0%).

The contraction ratio of the dollichopellic pelvis is determined by the size of the cross-section diameter of the pelvic outlet:

I contraction ratio - the cross-section of the pelvic outlet size is 12,5-11,5 cm;

II contraction ratio - the cross-section diameter is 11,4-10,5 cm;

III contraction ratio - the cross-section of the pelvic outlet is less than 10,5 cm.

THE CHARACTERISTIC OF THE MOST COMMONLY OCCURING FORMS OF THE ANATOMICALLY CONTRACTED PELVIS AND THEIR DIAGNOSTICS

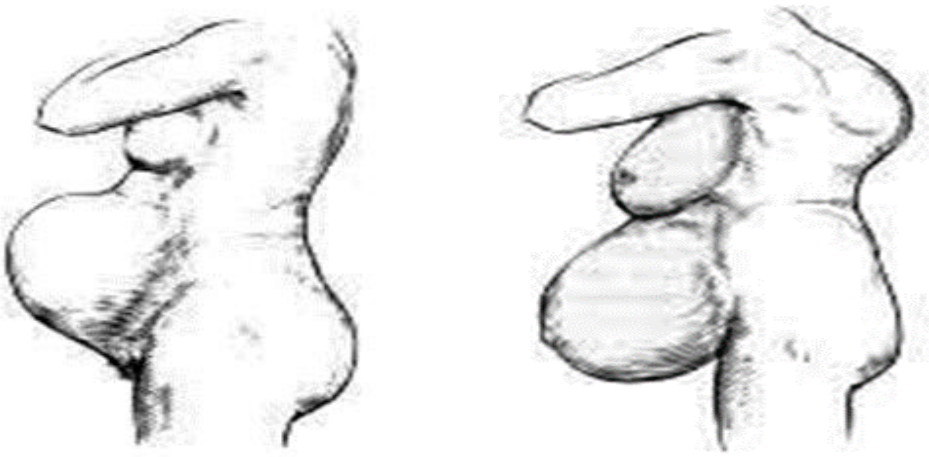
- **The general and special anamnesis. General objective data**

Since the pelvis is formed prenatally, when taking the anamnesis, it is necessary to pay attention to the antenatal germination period (the metabolic disorder between the mother and the fetus, especially the mineral one, the deficit of vitamins, the imperfect osteogenesis). The proper management of the physical development of girls is the key factor in the female organism formation system (including but not limited to the pelvis). That's why when taking the anamnesis related to the neonatal period and the early childhood it is necessary to clear up questions related to the girl feeding, the course of the early childhood (coming through of teeth, sitting, walking), the presence of the past rachitis, the dysplasia, the congenital dislocation of hip joints, infections (the bone tuberculosis, poliomyelitis), pelvis and spine injuries; related to the pubertal growth stage – stresses, loads, violations of the school hygiene, the hormone imbalance, the dress code – the so-called «jeans» pelvis, early sports activities; taking into consideration the acceleration.

The special anamnesis includes: the beginning and the nature of menstrual cycles, the course and the result of previous pregnancies and labors, the operative delivery (obstetrical forceps, the vacuum assisted delivery, the caesarean section), the dead birth, head injuries of newborns, the neurological status disorder in the early neonatal period, the neonatal mortality, further development disorders.

General objective data:

At the beginning of the pelvis assessment it is necessary to carry out the visual inspection of the woman in the upright position. Then the weight and the height are measured, signs of previous diseases are tracked especially with the further changing of bones and joints (the rachitis, the tuberculosis), the condition of the skull, spine (the scoliosis, the cyphosis, the lordosis and etc.), limbs (shortening of one leg), joints (the ankylosis in coxal, knee and other joints), the step are examined. The form of the abdomen is fixed: the pointed one of the primara (fig. 8.1 a) or the hanging down one of the pluripara (fig. 8.1 b).



a b

Fig. 8.1. The form of the abdomen is fixed:
the pointed one of the primara (a) or the hanging down one of the pluripara (b)

The form of the quadrilateral of Michaelis is of the great significance for the pelvis assessment. If the pelvis is normal-sized, then its longitudinal size and crosswise size will be equal to 11 cm. The form of the quadrilateral of Michaelis can be various, if the pelvis constitution is different (fig. 8.2).

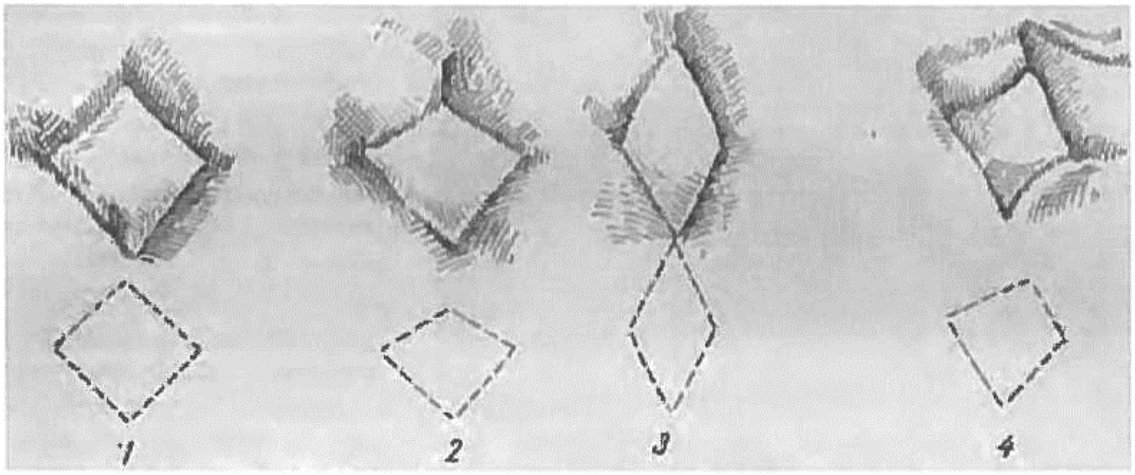


Fig. 8.2. Forms of the quadrilateral of Michaelis in various pelvis constitution options:
1 – the normal pelvis; 2 – the flat pelvis; 3 – the dollichopellic pelvis; 4 – the coxalgic pelvis

The woman's height is one of key factors. The woman's height less than 155-160 cm gives the reason to suspect the presence of the anatomically contracted pelvis. The shoe size less than 36, the foot length less than 36, the length of the footstep less than 23, the length of the wrist less than 16 cm, the

length of the 1st and the 3rd finger of the hand less than 6 cm and 9 cm accordingly are anthropometric markers of the contracted pelvis of the woman.

To assess the bone thickness, it is necessary to measure the circle of the radiocarpal joint (**the Solovyev's index**) at the level of outstanding condyles of the forearm. The lower is the index, the thinner are bones and the greater is the pelvis volume and vice versa (the normal Solovyev's index is 14,5-15 cm).

Key pelvis measurements are the external pelvimetry: distantia spinarum (normal 25-26 cm), distantia cristarum (normal 28-29 cm), distantia. trochanterica (normal 31-32 cm) and conjugata externa (the normal Bodelock's diameter - 20-21 cm).

To carry out the diagnostics of the contracted pelvis with the reduction of the conjugate diameter of the broad pelvic cavity it is necessary to measure the pubic-sacral size i.e. the distance from the middle of the symphysis to the connection of the 2nd and the 3rd sacral vertebras. This size of the anatomically normal pelvis is **21,8 cm**. It is also necessary to measure the height of the pubic symphysis (the distance between the upper and the lower edges of the pubic symphysis). The measurement is carried out using the pelvimeter. **The normal size of the symphysis is 5,0-6,0 cm.**

The width of the symphysis is measured between inguinal folds along the top of the symphysis using the measuring tape. The normal width of the symphysis is 13,0-13,5 cm.

The crosswise size of the pelvic outlet is measured using the measuring tape from the right internal surface of the ischial tuberosity to the left one. The normal crosswise size of the pelvic outlet is 9 cm.

The straight size of the small pelvis outlet (9-11 cm) is measured using the pelvimeter. It goes from the top of the tail bone to the bottom edge of the symphysis.

Additional measurements include the determination of side conjugates i.e. distances between anterior- and posterior-up iliac spines from both sides (normal sizes are 14-15 cm). If the size is 13 cm, it is indicative of the pelvis contraction.

The reduction in sizes of the pelvis circle (between trochanters and the iliac crest) to 70-75 cm, instead of the normal size 85 cm, is indicative of the pelvis contraction.

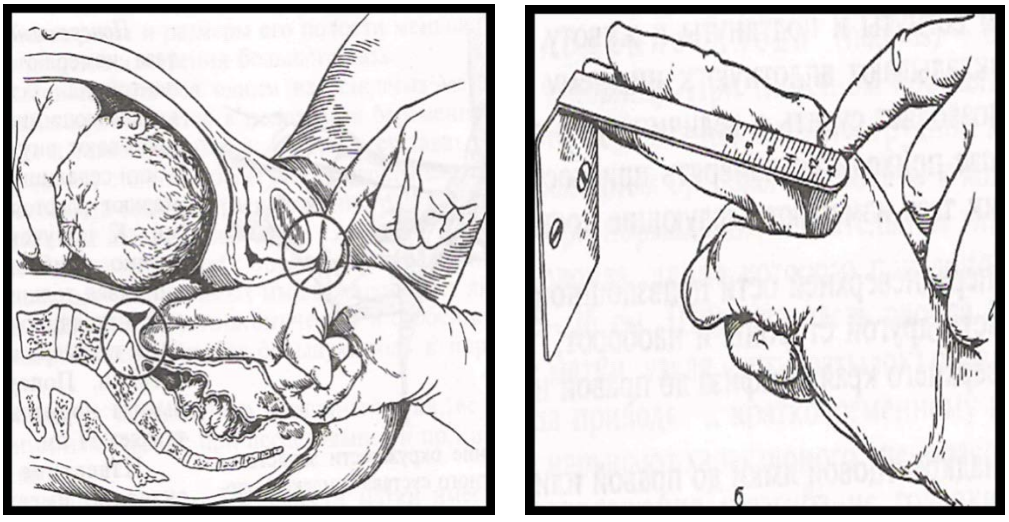
The difference in shoulder bone standing levels and the waist triangle shape deformation are indicative of the serious possibility of the coxalgic pelvis.

For the greater certainty oblique pelvic sizes are measured. Provided however that absolute values of oblique pelvic sizes do not matter because the difference of more than 1,5 cm between sizes of every measurement pair is typical for the pelvic asymmetry.

Oblique sizes include:

- the distance between the middle of the symphysis upper edge to posterior-up iliac spines from both sides (the normal size is 17,5 cm);
- the distance between the anterior-up iliac spine from the one side and the posterior-up iliac spine from the other side (the normal size is 21 cm);
- the distance between spinous processes of the 5^{th} lumbar vertebra and anterior-up iliac spines from both sides (the normal size is 18 cm);
- the distance between the anterior-up iliac spine and the posterior-up iliac spine of one and the same side (the normal size of the side Kerner's conjugate is 14-15 cm). Absolute values of the side conjugate provide the insight into internal pelvic sizes. If the pelvis is flat, they will exceed 13,5 cm. If the pelvis is asymmetrical, there will be differences between both conjugates.

The vaginal examination is also of great importance. During the vaginal examination the pelvic volume and the size of **the diagonal conjugate** are measured, reaching of terminal lines, ischial spines and tuberosities, the sacrum hollow are examined, the availability of the false promontory, the exostosis and deformations of the small pelvis are determined, the size of the pubic angle is measured and assessed (fig. 8.3).



A B

Fig. 8.3 Measuring methods of the true conjugate

Measuring methods of the true conjugate:

1. To deduct 9 cm of the external conjugate value.

2. To deduct 1,5-2,0 cm of the diagonal conjugate value (прии f the Solovyev's index is 14-16 cm and less, then 1,5 cm shall be deducted; if the index value is more than 16 cm, then 2 cm shall be deducted); if the pubic symphysis value is 4 cm and less, then 1,5 cm shall be deducted; if the pubic symphysis value is more than 4 cm, then 2 cm shall be deducted).

3. The distance from the suprasternal notch of the breast bone to the 7^{th} cervical vertebra is measured using the pelvimeter.

A. Commonly occurring forms of the contracted pelvis

1. **The dollichopellic pelvis**

Tall and slim women with hyperandrogenism signs often have this form of the pelvis. It is characterized by the decrease of crosswise sizes of the small pelvis by 0,6-1,0 cm and more, the relative shortening or the increase of the straight size of the pelvic inlet and the narrow of the pelvic cavity. The inlet to the small pelvis has a rounded or longitudinal and oval form, iliac wings are slightly spread, the pubic arch is narrow.

When carrying out the diagnostics of the dollichopellic pelvis, the special attention shall be paid to the measurement of the cross-section diameter of the quadrilateral of Michaelis (less than 10 cm), the crosswise size of the pelvic inlet plane (to calculate the crosswise size of the pelvic inlet plane 14-15 cm can be deducted from distantia cristarum), the cross-section diameter of the pelvic outlet (less than 10,5 cm), the width and the height of the symphysis and the depth of the pelvis.

If the pelvis is the dollichopellic one, then the width of the symphysis will be less than 12,5 cm, the height of the symphysis will be 6,5 cm and more, the crosswise size of the pelvic outlet will be less than 9 cm.

During the vaginal examination the approximation of ischial spines, the relatively easy reaching of terminal lines and the oblique pubic angle are noted. 50% of women with the dollichopellic pelvis have the tail bone flattering and the tail bone height increase to 10 cm and more. It is possible to precisely diagnose this form of the pelvis and especially the contraction ratio only with the application of the radiopelvimetry, the computed radiopelvimetry or the magnetic resonance imaging. Radiologically three forms of the dollichopellic

pelvis are distinguished: with the increase of the inlet straight diameter, with the decrease of the pelvic inlet plane straight size, with the decrease of the inter-axial diameter. However, the form of the pelvis can be definitely stated only by the asynclitism typical only for this very form of the pelvis.

The labor biomechanism in case of the dollichopellic pelvis can take place in the same manner as in case of normal sizes of the pelvis. If straight diameters exceed crosswise ones, then:

1) the head, when buckling, enters the small pelvis inlet by the sagittal suture in the straight size and carries out the forward movement to the outlet plane. If the crosswise diameter of the pelvic inlet is contracted, the asynclitism in the oblique size with the asynclitic location of the sagittal suture and lowering of the posterior parietal bone (more often) also further clearing of the obstacle;

2) at most cases of labors the perineal tear happens because the oblique pubic angle forms two hypomochlion points on pubic bones. This involves due and right carrying out of the right-sided medial lateral perineotomy. The labor tumor on the head of the newborn baby is located in the region of the sagittal suture more displacing to the one of parietal bones making it asymmetrical.

2. **Flat pelvises** (the simple flat pelvis, the flat rachitic pelvis, the pelvis with the decrease of the pelvic plane straight size)

In the flat pelvis straight diameters will be shortened when crosswise and oblique sizes are normal.

1) **The simple flat pelvis**

The simple flat pelvis is descried by **shortening of all straight diameters**, the sacral bone curvature is average, the pubic arch is wide, the inlet crosswise diameter is usually enlarged. The diagnostics of this form of the contracted pelvis is based on the examination of the quadrilateral of Michaelis. Due to the fact that the sacral bone comes to the fore, the size between the fossa under the spinous process of the 5^{th} lumbar vertebra and the middle of the straight diameter of the lumbosacral quadrilateral will be reduced. Because of this, the quadrilateral of Michaelis turns out to be of the irregular shape with the shortened vertical diagonal (less than 10 cm). There is no correlation dependence between the external conjugate, the true conjugate and all straight sizes of the small pelvis. However, there is the correlation dependence between the diagonal conjugate and the true conjugate. Hence it appears that it is not necessary for practicing physicians to focus on indices of the external conjugate.

Only internal assessment of the pelvis will give an opportunity to establish the diagnosis of the flat pelvis, if the promontory is reached. Depending on sizes of the diagonal conjugate, it will be possible to determine the contraction ratio. The computed radiopelvimetry or the magnetic resonance imaging will facilitate the establishment of the diagnosis of the simple flat pelvis.

Special features of the labor mechanism in case of the simple flat pelvis are:

1) the head extension and its long-term standing over the pelvic inlet with the sagittal suture in the crosswise size;

2) the head is configured and inserted in the pelvic inlet with one of its parietal bones i.e. the asynclitic insertion happens;

3) more often the head does not carry out the internal turn and the sagittal suture in all pelvic planes goes through in the crosswise size. The low transverse station of the sagittal suture happens at the pelvic floor.

When managing the labor, it must be remembered that it will be easier for the head to clear the obstacle at the small pelvis inlet, if the gravida is laid on the opposite side against the position of the fetus (this furthers the head extension). When the external orifice of the uterus is fully opened and delivery waters fully poured out in the second labor period, the patient can be put into the Mikeladze's position (when the gravida lies on the back with knees bended to the abdomen and hips are widely far apart), if the posterior parietal bone lowers into the pelvis provided that the anterior parietal bone easier slides from the pubic.

If the anterior parietal bone lowers, the woman in the second labor period for 30 minutes shall be laid to the Walcher's position (when the gravida lies on the back on the edge of the bed with legs lowered down and hanging and with the pelvis slightly up) or the special pile 20 cm high shall be placed under buttocks increasing the pelvic dip angle and the size of the true conjugate.

Taking into consideration the high probability of the perineal tear during the labor in case of the flat pelvis, it is necessary to carry out the right-sided central lateral perineotomy in due time. Taking into consideration the fact that the enlargement of the pelvis (especially its outlet) is noted when the gravida squats on hams, it makes sense to carry out the second labor period before lowering of the head at the pelvic floor and before beginning of expulsive pains in the vertical position of the woman.

2) **The flat rachitic pelvis**

The flat rachitic pelvis is descried by the **decrease of the pelvic inlet straight size and the increase of all other pelvic straight diameters**, the sacral bone is usually flat, the pubic arch is wide. When diagnosing this form of the pelvis it is necessary to pay attention to signs of the rachitis had in the childhood («caput quadratum», rare teeth with transversal notches, the hollow breast, «rib beading», the collar bone in the form of the Latin letter «S», «X»- or the «0»-shape curvature of legs, the spine, the breastbone and etc.). Iliac wings are spread. Usually they are almost equal to each other. The external conjugate is diminished. The vertical size of the quadrilateral of Michaelis is less than normal one provided that the upper triangular of the quadrilateral is less than the lower one. During the vaginal examination the sacral promontory is reached. It strongly moves to the fore (that way the pelvic entry by shape looks like the kidney or the heart); the sacral bone is **flattened, shortened, thinned and widened** (the Kolosov's rule of four «u»); sometimes the false promontory is noted; the pubic angle is obtuse. The certain diagnosis can be made after the radiopelvimetry, the CT-pelvimetry or the magnetic resonance imaging.

The labor biomechanism in case of the flat rachitic pelvis has the following features:

1. The long-term standing of the head with the sagittal suture in the crosswise size.
2. The moderate extension of the head: the anterior fontanel is placed at one and the same level with the occipital one or below it, the head goes through the true conjugate with the small crosswise size (8,5 cm).
3. The asynclitic insertion of the head is the anterior asynclitism (the «Negelev's» insertion) or the posterior (the «Litzman's» insertion). The anterior asynclitism is more frequent because the aggregation power of the parietal bone at the promontory is more than at the pubic. That's why the anterior parietal bone lowers into the pelvic cavity and the sagittal suture swerves off the promontory.
4. In connection with favorable spatial relations between the strongly configured head and the capacious pelvis cavity the internal turn is carried out in the small pelvis cavity.
5. In the second labor period the head moves forward very fast (the «storm» labor).

6. The absence of the right rotation of the head in the small pelvis cavity and the storm nature of the second labor period leads to the perineal tear, up to the tear of the sacrococcygeal joint.

3) **The pelvis with the decrease of the pelvic plane straight size**

It is characterized with the flattening of the sacral bone up to the absence of the curvature, its extension, the decrease of the pelvic plane straight diameter (less than 12 cm), the absence of the difference between straight diameters of the inlet, plane and neck of the cavity. Other diameters are usually normal or enlarged.

There are two possible contraction ratios:

I ratio - the pelvic plane straight diameter is 12,4-11,5 cm;

II ratio – less than 11,5 cm.

The measurement of the pubic and sacral size i.e. the distance from the middle of the symphysis to the connection point of the 2nd and the 3rd sacral vertebras is the most informative thing for the diagnostics of the contracted pelvis with the decrease of the pelvic plane straight size. For the anatomically normal pelvis the value of this size is **21,8 cm**. If the value is less than 20,5 cm, it will be indicative for the contracted pelvis. If the value is less than 19,3 cm, it will be indicative for the expressed decrease of the pelvic plane straight diameter (less than 11,5 cm).

4) **The generally contracted pelvis**

Not tall, well-proportionate women have the generally contracted pelvis. It is characterized with the decrease of all pelvic sizes by one and the same value (1,5-2,0 cm and more).

The quadrilateral of Michaelis is of the right form but both its longitudinal diameter and the crosswise diameter are less than 11 cm.

Informative data acquired when measuring the pelvic outlet diameter namely: the straight size and the crosswise size are less than 9 cm. When carrying out the internal examination, the hollow of the sacrum is deep, the promontory and terminal lines are reached.

The labor biomechanism includes the following points:

1. The head enters the pelvis in the strongly buckled condition, the size is less than the small oblique size; the posterior fontanel approaches the

geometrical center of the pelvis (the deep standing of the posterior fontanel is the Rederer's asynclitism); the sagittal suture is located in one of oblique sizes of the pelvis. The head moves along the pelvis slowly, with great efforts.

2. The additional maximum buckle of the head and its internal turn are carried out when crossing the plane to the narrow. The head is located at the pelvic floor with the sagittal suture in the outlet straight size.

3. The head of the fetus cannot fill the whole space of the pubic angle. That's why it stretches the perineum. This leads to the trauma of muscles and fascia of the perineum and then to the tear.

4. When the head is born, the internal turn of shoulders and the external turn of the head are carried out. The form of the head is dolichocephalic one (the head is stretched in the form of the cone with the labor tumor in the region of the posterior fontanel.

After the beginning of expulsive pains the gravida with the generally contracted pelvis shall be laid to the side in accordance with the position of the fetus. It considerably reduces time necessary for the insertion of the head in the pelvic inlet and clearing the obstacle.

The diagnostics is based on anthropometric data, the external pelvimetry, the quadrilateral of Michaelis and the vaginal examination. The certain diagnosis can be made after the radiopelvimetry, the CT-pelvimetry or the magnetic resonance imaging.

Measuring of external sizes of the large pelvis reflects the form and the capacity of the small pelvis not to the full extent. Consequently, <u>in the presence of the technical opportunity and trained specialists</u> it is possible to apply additional assessment methods of internal pelvic sizes such as the radiopelvimetry, the magnetic resonance imaging and rarely ultrasonography.

<u>The radiopelvimetry</u>

Notwithstanding the relatively small radiation exposure it is recommended to apply the radiopelvimetry for the assessment of sizes and the form of the pelvis either in the non-pregnant state or in case of the full-term pregnancy (38 weeks and more).

Indications for the radiopelvimetry:

- the contraction of the large pelvis and the small pelvis identified during the external obstetrical examination and the internal obstetrical examination;
- large sizes of the fetus (4000 g and more);
- complications of previous labors (the prolonged labor, the trauma of the fetus and the newborn baby, the application of forceps and etc.);
- the pelvic presentation.

The magnetic resonance imaging (fig. 8.4)

At present the more perspective method is the magnetic resonance imaging (MRI) because it is the radiation-proof and the high-quality visualization method.

Key indications for the application of the MR-pelvimetry and MR-fetometry are:

- The suspected anatomically contracted pelvis.
- Suspected anatomical changes of the pelvis – the exostosis, the trauma of the pelvis in the anamnesis, the early rachitis and the early poliomyelitis, the inborn dislocation of hip joints, the separation of the pubic symphysis.
- The large size of the fetus (more than 4000 g).
- The pelvic presentation.
- The presence of the cicatrical tissue at the uterus.
- Pregnant women from the high-risk group of the perinatal pathology namely: multipara with the complicated course and the adverse outcome of previous labors; ovaries, the uterus, the vagina, the placenta, bones and joints of the pelvis.

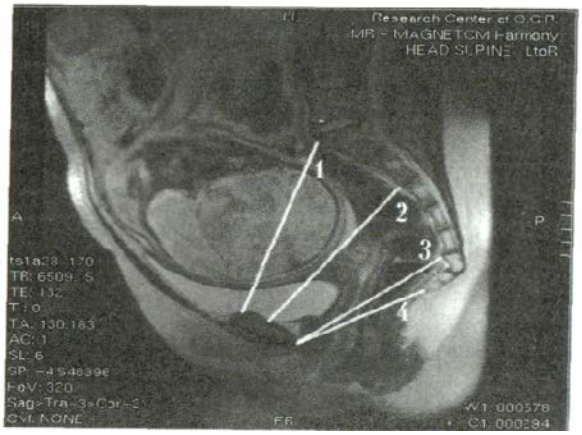


Fig. 8.4. The ultrasonography

The ultrasonography for its informational content backs the X-ray examination and the MR imaging because when applying the sensor externally it gives an opportunity to determine only the true conjugate and also the location of the head of the fetus, its sizes, insertion features. During the labor it gives an opportunity to determine the dilation ratio of the external orifice of the uterus.

The combination of the ultrasonography and the radiopelvimetry is more informative when diagnosing the contracted pelvis. The value of the pelvic index of the fetus is based on measurements of the head of the fetus during the ultrasonography and the determination of the pelvic inlet circle and the pelvic plane during the radiopelvimetry.

LABOR OUTCOME FORECASTING IN CASE OF THE ANATOMICALLY CONTRACTED PELVIS

The assessment not only precise pelvic sizes but also the proportionality between the pelvis and the head of the fetus is of the great importance when forecasting of the labor outcome. The risk group of the functional inferiority of the small pelvis includes women with the decreased capacity of the small pelvis due to the anatomical contraction and pregnant women with the suspected heavy-weight fetus.

At present the most precise and safe assessment method of the pelvic capacity is the magnetic resonance imaging of pelvic organs with the pelvimetry.

The supposed weight of the fetus is calculated using generally accepted formulae taking into consideration abdominometrical indices of the pregnant woman. At the same time there are some complications when calculating the supposed weight of the fetus in women with the adiposity, the water abundance, the «flat» abdomen. That’s why it is advisable to calculate the weight of the fetus taking into consideration its sizes during the ultrasound scanning.

In case of **the first** contraction ratio of the pelvis, average sizes of the fetus (the supposed weight of the body is up to 3600 g) and the absence of other confounding factors, the labor **can be started through the birth canal with the functional assessment of the pelvis.**

In case of **the second** contraction ratio of the pelvis it is recommended to carry out the delivery using the caesarean section surgery. Carrying out of the labor through the birth canal is possible only on extraordinary occasions (small

sizes of the fetus (the weight is up to 3000 g), the good readiness of the birth canal, the favorable insertion of the head).

In case of other contraction ratios of the pelvis it is recommended to carry out the planned caesarean section surgery.

FEATURES OF THE COURSE AND THE MATERNITY CARE

For pregnant women with the contracted pelvis is typical:

1. The head of the fetus inside primiparous remains mobile over the pelvic inlet till the beginning of the labor. Because of this, the excursion of lungs is considerably limited and the heart shifts. The labored breathing in the end of the pregnancy appears earlier, remains longer and more expressed in comparison with the pregnancy of women with the normal pelvis.

2. The uterus of pregnant women with the contracted pelvis is distinguished by the mobility. This fact together with the high standing of the head predispose to the transverse, the oblique or the pelvic presentation of the fetus; further the appearance of extension presentations of the head (the presentation of the bregma, the brow or the face presentation of the fetus).

3. The premature rupture of membranes is one of the most frequent complications in the pregnancy. Wherein the umbilical cord prolapse can happen.

4. The over-frequency of the symphyseopathy and the sacroileopathy. This pathology can be expressed in the separation of the pubic joint and the sacroiliac joint, the excessive movability and the relaxation of pelvic joints, inflammatory processes in pelvic joints. More often than not this pathology is observed in pregnant women with coxalgic pelvises.

5. The high probability of the premature labor.

At the gestational age of **38 weeks pregnant women** with anatomically contracted pelvises and the supposed imbalance between sizes of the pelvis and the fetus shall be admitted to the hospital in the pathologic pregnancy department in accordance with regional routing sheets of pregnant women to adjust the pregnancy period, the weight of the fetus, sizes of the pelvis, the position and the presentation of the fetus, its condition and to resolve the issue related to the labor method.

The labor method shall be determined taking into consideration data of the anamnesis, the readiness of the birth canal for the labor, the anatomical form of the contracted pelvis and its contraction ratio, the supposed weight of the fetus, other complications in the pregnancy.

Pregnant women with the 1st ration contracted pelvis and the supposed weight of the fetus not more than 3600 g can begin the labor through the birth canal.

It will be ideal if the labor activity develops individually in case of the integral embryonic vesicle.

The labor management tactics:

- the uninterrupted cardiac monitoring of the condition of the fetus and the labor activity (the cardiocotography) (the heart beat disorder of the fetus can be the early sign of the clinical contracted pelvis);
- the partogram management;
- tracking of the head insertion nature of the fetus and its movement;
- the timely diagnostics of complications of the labor act and their correction to avoid the prolonged labor and if necessary to fall back on the urgent operative delivery by the caesarean section. In addition to the above it is necessary to operate not for the main indication of «the uterus rupture hazard» showing the fact of the late diagnostics but for the main indication of «the clinically contracted pelvis».

The risk of respiratory disorders is higher in children born as the result of the caesarean section before the labor activity. However this risk is reduced dramatically after the 39th week of the pregnancy. As can be seen from the above the planned caesarean section shall be carried after the 39th week of the pregnancy.

Indications for the planned caesarean section:

1) disproportions of the fetus and the pelvis (the anatomically contracted pelvis of the II-III contraction ratio, the pelvic deformity, the exostosis, the osseous growth, tumors of the uterus and ovaries located in the cavity of the small pelvis);

2) combinations of the I contraction ratio of the pelvis with the obstetrical pathology: the tendency towards carrying beyond the term and the unreadiness of the birth canal for the labor, the large fetus, the pelvic

presentation, the malposition and the presentation of the fetus, the nasty preeclampsia, the chronic fetal hypoxia, old-ages primiparous, the cicatrical tissue at the uterus, the dead birth in the anamnesis, abnormalities in the development of genitals, the symphysitis and etc.

Indications for the <u>urgent</u> caesarean section in case of the anatomically contracted pelvis:

1) the absence of the labor activity after the discharge of the amniotic fluid in case of the immature neck of the uterus;

2) labor activity abnormalities;

3) the brow, the face, the high straight standing of the sagittal suture at the left occipitoposterior presentation;

4) the clinical disharmony of sizes of the head of the fetus and the pelvis of the mother.

The application of vaginal assisted deliveries in case of the anatomically contracted pelvis is possible only in the extreme insisting on the urgent delivery namely: the acute fetal stress when its **head reached the pelvic floor and only in case of the absence of signs of the clinical disharmony of the head of the fetus and the pelvis of the mother.**

The preparation of the uterus neck to the labor and the labor induction is carried out according to schedules including but not limited to the application of the mifepristone, dinoprostone, hygroscopic dilatators and the oxytocin. Indications for the premature rupture of membranes and also the unreadiness for the labor in the full-time term (more than 38-39 weeks) taking into consideration of the form and the contraction ratio of the pelvis (not more than the 1st contraction ratio) and also other obstetrical data (the woman's age, the obstetrical anamnesis, sizes and the weight of the fetus, its condition, the presence of the extragenital pathology and etc.).

THE CLINICALLY CONTRACTED PELVIS

The term of the clinically contracted pelvis is connected with the labor process it is the imbalance between the head of the fetus and the pelvis of the mother notwithstanding the sizes of the latest.

The frequency and reasons for the clinically contracted pelvis

The most frequent **reasons** for the clinically contracted pelvis are:

- the anatomical contraction of the pelvis,
- the large size of the fetus or their combination,
- unfavorable presentations and insertions of the head of the fetus:
- the brow presentation,
- the face presentation
- the left occipitoposterior presentation,
- the high straight standing of the sagittal suture,
- asynclitic insertions,
- head extensions in case of the pelvic presentation,
- the hydrocephalus.

Codes of ICD-10

065 The difficult labor because of the abnormality of the mother's pelvis.

065.0 The difficult labor because of the pelvic deformity.

065.1 The difficult labor because of the uniformly contracted pelvis.

065.2 The difficult labor because of the pelvic inlet narrowing.

065.3 The difficult labor because of the outlet narrowing and the mean diameter of the pelvis.

065.4 The difficult labor because of the disharmony between sizes of the pelvis and the unspecified fetus.

065.5 The difficult labor because of the abnormality of the mother's pelvic organs.

065.8 The difficult labor because of other abnormalities of the mother's pelvis.

065.9 The difficult labor because of the unspecified abnormality of the mother's pelvis.

Diagnostic indicators of the clinically contracted pelvis

Essential features of the clinically contracted pelvis are:

- the long-term (more than 1 hour) standing of the head in small pelvis planes;
- the loss of synchronization of cervical dilatation processes and the advancement of the fetus;

- the expressed configuration of the head;
- the genesis of the big labor tumor;
- unfavorable presentations and the insertion of the head: the left sacroposterior presentation, extension options, the asynclitism, the cuneate insertion, the high straight standing of the sagittal suture;
- the absence of the advancement of the head of the fetus in case of the full cervical dilatation;
- the imbalance between the labor mechanism and the form of the pelvis;
- the presence of labor pains;
- the titubation of the gravida;
- the appearance of expulsive pains when the head is located higher than in the narrow part of the cavity of the small pelvis;
- the urinary difficulty or the cessation of the self-induced urinary;
- the impairment of uterine contractions;
- the palpatory tenderness of the lower segment;
- the fetal hypoxia;
- the overriding.(positive Vasten's trait)

To determine the **overriding (Vasten's trait)** the palm is located to the surface of the symphysis and then moved up to the region of the presented head. If the overriding is positive, the anterior surface of the head will be located higher than the surface of the symphysis or at the one and the same level which reflects the imbalance between the mother’s pelvis and the head of the fetus (fig. 8.5).

Fig. 8.5. Determine the overriding (Vasten's trait)

Notwithstanding the fact that the imbalance of the mother's pelvis and the head of the fetus represents the acute difficulty or the impossibility of its birth through the birth canal happening in the second labor period, signs of the clinically contracted pelvis can appear as early as in the end of the first labor period. These signs include **unfavorable forms of the head insertion** (the left occipitoposterior presentation, the insertion of the bregma, the straight standing of the sagittal suture), the edema of the neck of the uterus, the appearance of expulsive pains in case of the highly located head (pressed against the inlet of the small pelvis), the excessive configuration and the fetal head swelling. In the second labor period the following signs are added: the absence of the head advancement, the further growth of the labor tumor, the long-term standing (more than 1 hour) of the head in the one plane. Remaining ones join later.

The classification of the clinically contracted pelvis

The relative imbalance (the I ratio).

The first ratio of the clinically contracted pelvis is characterized with the following signs of the clinical imbalance: the insertion of the head of the fetus typical for this form of the contracted pelvis, its moderate configuration.

Moreover, the weak labor activity in the end of the first labor period is observed in primiparous.

The absolute imbalance (the II ratio).

The diagnosis of the clinically contracted pelvis of the **second - third imbalance ratio** includes the following diagnostic indicators: features of the head insertion do not correspond to the form of the pelvis, the expressed configuration of the pelvis and the expressed labor tumor on the head of the fetus are in process, expulsive pains appear at the highly standing head, the woman is impatient, the neck of the uterus hangs down in the form of the hose into the vagina, the lower segment of the uterus is acute and painful, the neck of the uterus is edematous, the absence of the advancement of the head during dilating pains in case of the full cervical dilatation, labor activity abnormalities, sanioserous excrements from the birth canal, the fetal hypoxia and the inappropriate urination appear, the overriding is positive.

The labor management in case of the clinically contracted pelvis

The labor course in case of the clinically contracted pelvis is characterized with multiple complications. The most frequent are the untimely discharge of the amniotic fluid (50-60%) and labor activity abnormalities (40%); the prenatal fetal hypoxia (14%).

To resolve the issue related to the urgent abdominal delivery in case of the clinically contracted pelvis 2-3 signs of the absolute imbalance are enough.

The delivery of all women in labor with the clinically contracted pelvis of the II ratio shall be performed by the urgent caesarean section.

Carrying out of the caesarean section in case of the clinically contracted pelvis has certain challenges especially in case of the full cervical dilatation and of the low location of the head. During the section the violent atrophy of the lower segment of the uterus and sometimes the hematoma at the posterior wall of the uterus appear. The increased hemophilia needs the additional surgical hemostasis and the injection of the fresh-frozen plasma in case of the capillary bleeding, the coagulopathy, the hemorrhagic syndrome or the massive blood loss. The prolongation of the cut on the uterus (3,4%), the difficult extraction of the fetus (6,8%), the hypotonic bleeding (1,1%) can happen in the early postoperative period.

The labor traumatism happens in 27,0% newborn babies. The following signs are brought out: the hyperexcitability syndrome (18,2%), the suppression syndrome of the central nervous system (4,5%), the convulsive disorder (2,3%), the dermal and the hemorrhagic syndrome (6,8%), the hematoma of hips and shoulders (1,1%), the cervical and the radicular syndrome (2,3%), the cephalhematoma (1,1%), the subarachnoid bleeding (2,3%).

In case of the clinically contracted pelvis in women the serious traumatism (up to 1%) in the form of the tear of the symphysis, the II ratio perineal tear, the injury of sacroiliac joints, the tear of the uterus, the separation of the uterus from vaginal fornixes, the elaboration of urinogenital and rectovaginal fenestrations can happen.

Challenge questions and samples of answers:

1. Give the definition of the “contracted pelvis”

The sample of the answer: It is the pelvis if any one or more of its sizes is decreased by 1,5-2 cm or more in comparison with the normal value.

2. What are key reasons of the “contracted pelvis” formation?

The sample of the answer:

1. The undernutrition at the early age.

2. Common acute and chronic diseases at the early and the puberty age.

3. The following diseases lead to the pelvis deformation: the rachitis, the infantile cerebral paralysis (ICP), the poliomyelitis, tumors, the tuberculosis.

4. Pelvis abnormalities as the result of the spinal deformity: the cyphosis, the scoliosis, the tail bone deformation, inheritable pelvis abnormalities.

5. The deformation of lower limbs: diseases and the dislocation of hip joints, the atrophy and the absence.

6. The pelvis deformation as the result of injuries: car accidents, earthquakes and etc.

7. Menstrual function disorders.

8. The hyperandrogenism.

9. The ovarian dysfunction.

10. The infertility + the habitual non-carrying of the pregnancy are often associated with anatomically contracted pelvises.

11. Excessive psychophysical at the puberty age.

3. Which “contracted pelvises” are classified as commonly occurring forms?

The sample of the answer:

1) the dollichopellic pelvis (45, 2 %);

2) the flat pelvis: the simple flat pelvis – the Deventer’s pelvis (13,6 %), the flat rachitic pelvis (6,5 %), the pelvis with the reduction of the conjugate diameter of the broad pelvic cavity (21,8 %));

3)the general uniformly contracted pelvis (8,5 %).

4. Which pelvises are classified as uncommonly forms of the contracted pelvis?

The sample of the answer:

1) the coxalgic and the obliquely oval contracted pelvis;

2) the pelvic contracted by the extosis, the osseous growth because of the pelvis displaced fracture;

3) other forms of the pelvis (the assimilated, funnel-shaped, kyphotic, osteomalacic, spondylolisthetic, inverted or open fronted pelvis).

4) the pelvis contracted because of tumors of the ootheca, the uterus partially or fully located in the small pelvis cavity.

5. What is the value of the true conjugate in case of the I, II, III, IV contraction ratio of the pelvis? (the Palmov's classification)

The sample of the answer:

I ratio: the true conjugate 10,5 - 9,1 cm (96,8 %);

II ratio: 9,0 - 7,6 cm (3,18 %);

III ratio: 7,5 - 6,6 cm (0,02 %);

IV ratio: less than 6,5 cm (0,0 %).

6. The term "the clinically contracted pelvis".

The sample of the answer: it is the pelvis with the inconsistency between sizes of the fetus and the pelvis of the mother.

7. What are signs of "the contracted pelvis" which can be identified when examining of the pregnant woman?

The sample of the answer:

a) the deformation of the skeleton;

b) changing of the form of the quadrilateral of Michaelis;

c) the hanging down or the pointed form of the abdomen.

8. What are diagnostic methods of the anatomically contracted pelvis?

The sample of the answer:

a) the anamnesis;

b) the general visual inspection;

c) anthropometric data;

d) the external obstetric examination, the pelviometry;

e) the internal obstetric examination, the diagonal conjugate;

f) the radiopelvimetry, the computed tomography (CT), the magnetic resonance imaging (MRI).

9. What are signs of the clinical imbalance between sizes of the mother's pelvis and the head of the fetus?

The sample of the answer:

a) the mobility of the head over the small pelvis inlet before the beginning of the labor;

b) the absence of the progressive advance of the presented part of the fetus along the birth canal in case of the satisfactory labor activity;

c) positive Vasten's and Tsiangeimeister's symptoms;

d) the edema of the neck of the uterus and external genitals;

e) convulsive expulsive pains and labor pains;

f) the hyperextension of the lower segment of the uterus;

g) phenomena of the critical rupture of the uterus.

10. What complications of the pregnancy can be observed in case of the "contracted pelvis"

The sample of the answer:

a) the malpresentation;

b) the premature rupture of membranes or the premature (early) rupture of membranes;

c) the prolapsed cord.

11. What is the configuration of the head observed in case of the flat pelvis?

The sample of the answer: Brachycephalic.

12. What is the form of the pelvis when the head is extracted in the inlet of the small pelvis?

The sample of the answer: The flat rachitic pelvis.

13. What is the form of the pelvis when the low transverse station of the sagittal suture is observed?

The sample of the answer: The simple flat pelvis.

14. What is the form of the pelvis when the high straight standing of the sagittal suture is observed?

The sample of the answer: The dollichopellic pelvis.

15. What are possible complications of the first labor period in case of the contracted pelvis?

The sample of the answer:

a) the untimely discharge of the amniotic fluid;

b) the prolapse of small parts of the fetus; the cord;

c) labor activity abnormalities;

d) the clinically contracted pelvis;

e) the infection.

16. What are possible complications of the second labor period in case of the contracted pelvis?

The sample of the answer:

a) the secondary uterine inertia;

b) the long-term standing of the head in one plane;

c) the prenatal fetal hypoxia;

d) the hyperextension of the lower segment of the uterus;

e) the uterine rupture.

17. What is the contraction ratio of the pelvis when the labor can end unprompted?

The sample of the answer: The first one.

18. What should be done at signs of the critical uterine rupture?

The sample of the answer:

a) to relieve the labor activity – the heavy ether narcosis

b) to perform the caesarean section.

19. What is the delivery mode indicated in case of the clinically contracted pelvis and the dead fetus?

The sample of the answer: The caesarean section.

20. What is the delivery mode indicated in case of the III ratio of the pelvis contraction and the live fetus?

The sample of the answer: The caesarean section.

21. What is the delivery mode indicated in case of the IV ratio of the pelvis contraction?

The sample of the answer: The caesarean section – the invariable indication.

The student shall know:

1. The conception of the anatomically contracted pelvis.
2. The conception of the clinically contracted pelvis.
3. The etiology and the frequency of occurrence of the contracted pelvis.
4. The classification of contracted pelvises according to the contraction form: commonly and uncommonly occurring forms of contracted pelvises.
5. The classification of contracted pelvises according to the contraction ratio.
6. The characteristics of the generally contracted pelvis.
7. Types of the generally contracted pelvis.
8. Features of the labor biomechanism in case of the generally contracted pelvis.
9. The characteristics of the simple flat pelvis; features of the labor biomechanism.
10. The characteristics and features of the labor biomechanism in case of the reduction of the pelvic plane straight size.
11. The characteristics and features of the labor biomechanism in case of the flat rachitic pelvis.
12. The diagnostics of the contracted pelvis according to data of the anamnesis, the external examination and the combined obstetrical examination.
13. The additional pelvimetry at suspicion on the anatomical contraction of the pelvis.
14. The diagnostics of the clinically contracted pelvis (the determination of the clinical imbalance between the pelvis of the mother and the head of the fetus).
15. The prenatal care in case of the contracted pelvis.
16. The labor course, possible complications for the mother and the fetus in case of the contracted pelvis.
17. The care of the II labor period in case of the contracted pelvis.

18. The care of the I labor period, preventative measures and the therapy of complications in case of contracted pelvises.

19. Indications for the caesarean section in case of the anatomically and clinically contracted pelvis.

20. Preventative measures of complications connected with contracted pelvises in the maternity welfare center.

The student shall know how to:

1. Measure external sizes of the pelvis.
2. Measure sizes of the pelvic outlet plane.
3. Measure the diagonal conjugate.
4. Measure sizes of the quadrilateral of Michaelis.
5. Calculate the true conjugate.
6. Measure the Solovyev's index and apply it when assessing sizes of the pelvis.
7. Determine the Vasten's sign.
8. Determine the position of the head in the cavity of the small pelvis.
9. Determine the position of seams and fontanels of the head of the fetus towards landmarks of the small pelvis.

Questions for the self-preparation:

1. The conception of the anatomically contracted pelvis.
2. The conception of the clinically contracted pelvis.
3. The etiology and the frequency of occurrence of the contracted pelvis.
4. The Palmov's classification of contracted pelvises according to the contraction form.
5. The classification of contracted pelvises according to the contraction ratio.
6. The characteristics of the generally contracted pelvis.
7. Types of the generally contracted pelvis.
8. Features of the labor biomechanism in case of the generally contracted pelvis.
9. The characteristics of the simple flat pelvis; features of the labor biomechanism.
10. The characteristics and features of the labor biomechanism in case of the reduction of the pelvic plane straight size.

11. The characteristics and features of the labor biomechanism in case of the flat rachitic pelvis.

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13. The additional pelvimetry at suspicion on the anatomical contraction of the pelvis.

14. The diagnostics of the clinically contracted pelvis (the determination of the clinical imbalance between the pelvis of the mother and the head of the fetus).

15. The prenatal care in case of the contracted pelvis.

16. The labor course, possible complications for the mother and the fetus in case of the contracted pelvis.

17. The care of the II labor period in case of the contracted pelvis.

18. The care of the I labor period, preventative measures and the therapy of complications in case of contracted pelvises.

19. Indications for the caesarean section in case of the anatomically and clinically contracted pelvis.

20. Preventative measures of complications connected with contracted pelvises in the maternity welfare center.

21. Indications for the radiopelvimetry, the computed tomography (CT), the magnetic resonance imaging (MRI).

Topic 9
DEFLECTION AND ABNORMAL ENGAGEMENTS OF THE FETAL HEAD

The goal of the class: to study causes of malpresentations and abnormal engagements of the fetal head, asynclitic engagements and abnormal stations of the fetal head; the diagnostics, mechanisms and the clinical course of labor, complications during labor and afterwards.

The place of the class: The predelivery room, the labor ward, the classroom, the simulation class.

Reference materials: phantoms, dolls, pelvises, training models, tables demonstrating:

1) degrees of deflection attitudes;

2) types of head configurations in case of different deflection attitudes;

3) types and degrees of asynclitic engagements.

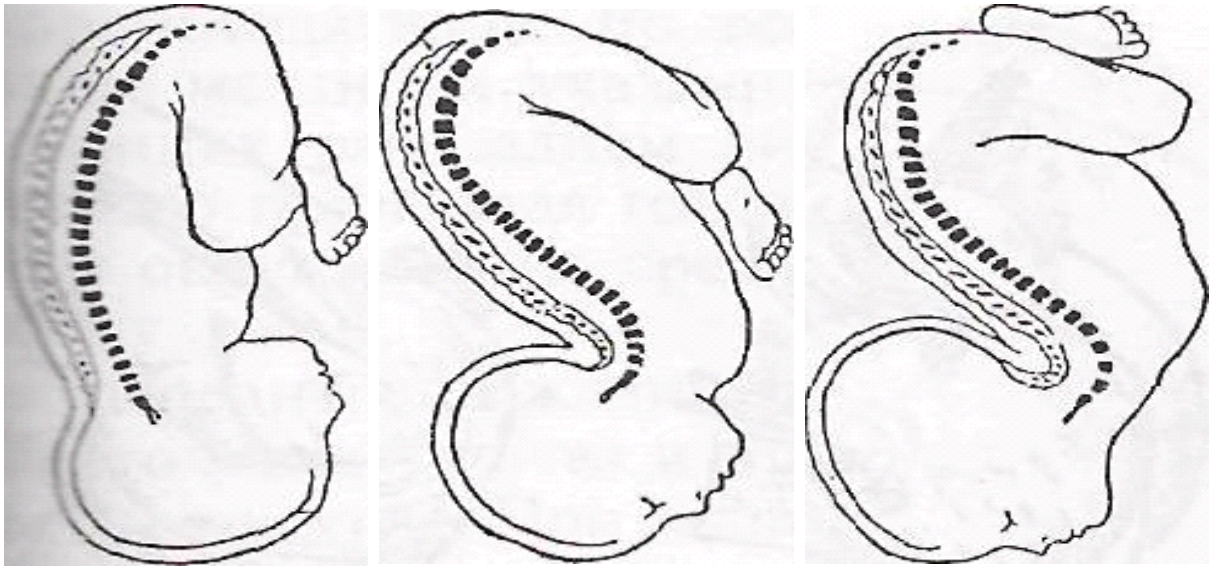
The subject matter of the class:

Deflection or extension of the fetal head (the head is engaged in the pelvic inlet extended) are found in 0,5-1% of labors. Deflection attitudes of the head include the presentation of the bregma (bregmatic presentation), the brow presentation and the face presentation.

Deflection attitudes of the fetal head appear both before the labor and during the labor. Usually they do not have any practical importance during the pregnancy because when the labor begins they are eliminated naturally. Only in exceedingly rare cases, for example in case of the big Derbyshire neck or the overwhelming ganglial hygroma of the neck of the fetus, as well as in case of large submucous myomas of the uterus, deflection of the fetal head can occur both during the pregnancy and during the labor.

During the labor any option of the fetal head deflection is not stable. It can change, evolve into other preceding and succeeding presentation options. For example, if the head is extended, the presentation of the bregma will become the vertex presentation, the brow presentation will become the face presentation and etc.

The most unfavorable option is the brow presentation because the head passes the plane of the pelvis by the verticomental diameter. Even if the fetus is not big, this will lead to material difficulties during the labor. The labor will be possible only if the weight of the fetus is very small (fig. 9.1).



bregmatic presentation *brow presentation* *face presentation*

Fig. 9.1. Deflection attitudes of the fetal head

Common for all degrees of deflection attitudes **are the following causes:**

- the insufficiency of the lower segment of the uterus,
- the contracted pelvis, especially the flat one,
- the hydramnios, the multiple pregnancy,
- the early rupture of membranes,
- the kyphosis of the mother's spine,
- the insufficiency of the anterior abdominal wall (the soft and the pendulous abdomen) and of the pelvic floor,
- submucous myomas of the uterus, the low insertion of the placenta,
- very big or vice versa very small head of the fetus,
- the loss of its usual elasticity by the fetus (the stillbirth),
- the congnital tumor of the thyroid body of the fetus;
- the occipitoatlantoid joint contractures,
- the short umbilical cord.

All degrees of deflection attitudes of the fetal head are mostly noted in multipara.

There are three degrees of deflection attitudes of the fetal head.

The first deflection degree, which is also called **the bregmatic presentation**, the head passes through the birth canal in such a manner that the leading point is the region of the anterior fontanel.

The second deflection degree, which is also called **the brow presentation**, is characterized by the greater extension of the head, which passes through the birth canal with the forehead (the leading point is the forehead) drawn down lower than all other parts of the head.

The third deflection degree is called **the face presentation.** The head is severely extended, so that the leading point is the chin of the fetus (fig. 9.2).

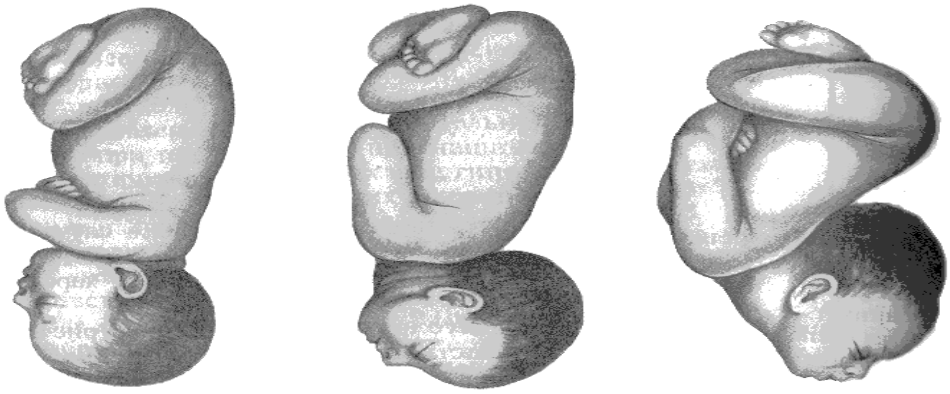


Fig. 9.2. Degrees of deflection of the fetal head

Deflection of the fetal head occurs in such cases when the head stands extended over the pelvic inlet or is in the inlet only by the small segment and has not been fixed yet. If the engagement is extended, the head will be extended in the inlet or in deeper sections of the pelvis by the bigger segment.

The bregmatic presentation

The identification of the bregmatic presentation is based on the data of the vaginal examination: the anterior fontanel and the posterior fontanel of the head are palpated simultaneously if they are located either on one and the same level or the anterior fontanel is located lower, and the posterior fontanel is located a bit higher. The sagittal suture in the pelvic inlet usually stands in the transverse (sometimes in the oblique) diameter. The type of the position of the fetus is determined based on the ratio between the fetal back and the anterior abdominal wall.

The cardinal movements of labor

The first cardinal movement of labor is the slight extension of the head in the inlet of the true pelvis.

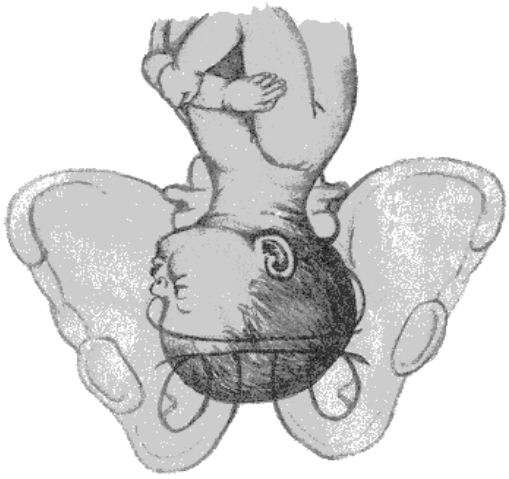


Fig. 9.3. The first cardinal movement of labor

The second cardinal movement of labor is the internal rotation of the head when lowering it in the pelvic cavity whereby the anterior fontanel is turned toward the front. At the pelvic floor the sagittal suture is located in the anteroposterior diameter, the forehead is turned to the symphysis, the back of the head is turned to the tail bone.

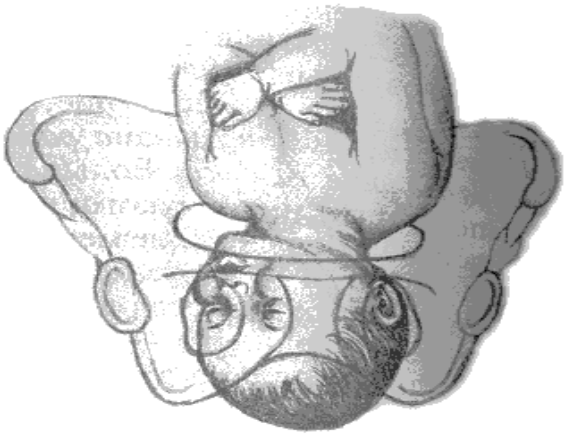


Fig. 9.4. The second cardinal movement of labor

The third cardinal movement of labor is the flexion of the head. The fixation point is between the lower edge of the symphysis and the glabellar area. The head is flexed around this point.

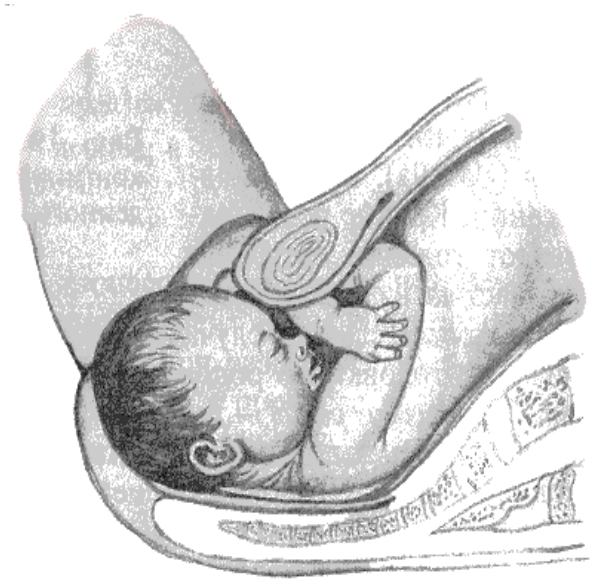


Fig. 9.5. The third cardinal movement of labor

The fourth cardinal movement of labor is the extension. The fixation point is between the top of the tail bone and the suboccipital fossa. The head is extended around this point.

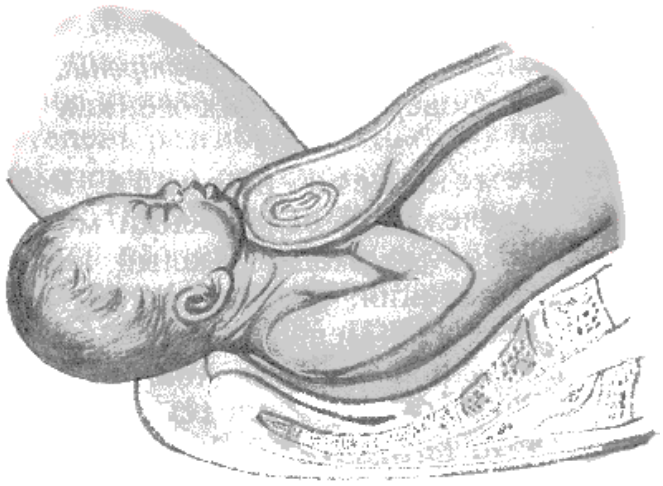


Fig. 9.6. The fourth cardinal movement of labor

The fifth cardinal movement of labor is the external rotation of the head and the internal rotation of shoulders. The axial point is **the anterior fontanel.**

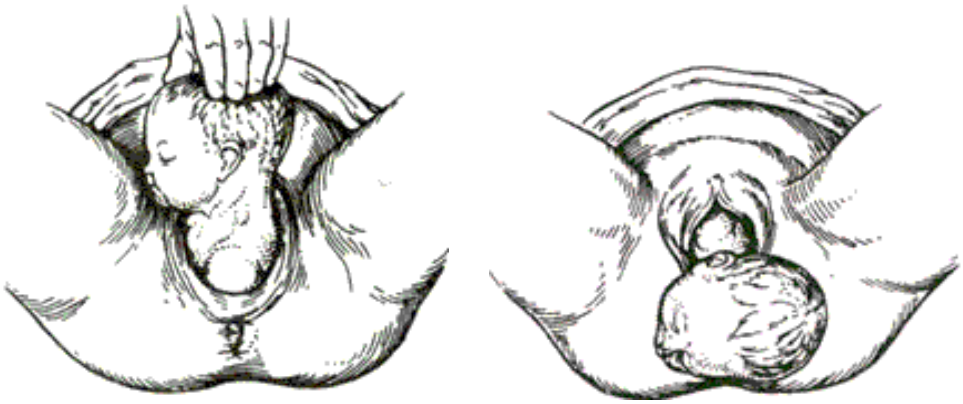


Fig. 9.7. The fifth cardinal movement of labor

The head is crowning through the vulvar ring with the circle corresponding to the **occipitofrontal diameter** (34 cm).

The diagnostics of the bregmatic presentation is based on the following fundamental differences from the occipitoposterior presentation:

1) in case of the bregmatic presentation both the anterior fontanel and the posterior fontanel of the head are palpated simultaneously if the anterior fontanel is located lower than the posterior fontanel; in case of the occipitoposterior presentation only the posterior fontanel is usually palpated;

2) in case of the presentation of the bregma fixation points are the glabella and the occipital protuberance; in case of the occipitoposterior presentation fixation points are the brim of the hairy part of the head and the region of the suboccipital fossa;

3) in case of the presentation of the bregma the head is crowning with the circle corresponding to the occipitofrontal diameter; in case of the occipitoposterior presentation the head is crowning with the circle corresponding to suboccipitofrontal diameter;

4) in case of the bregmatic presentation the molding of the head is located in the region of the anterior fontanel; in case of the occipitoposterior presentation - in the back of the head.

The course of the labor has its own features: the second stage is prolonged and entails the risk of the trauma and the fetal hypoxia. Crowning of the big-sized head (the circle) is followed by the overextension of the perineum and its trauma.

The labor management in case of the bregmatic presentation shall be conservative if it is possible.

The brow presentation

It is usually a transition from the bregmatic presentation to the face presentation. Hardly ever the head, having lowered to the pelvic floor, will be crowning in the brow presentation.

It is difficult to diagnose the brow presentation during the external examination. It is possible to palpate the sharp edge of the chin of the one side through the anterior abdominal wall and to detect the angle between the back of the fetus and the back of the head of the other side. The definite diagnosis can be made only based on data of the vaginal examination when the frontal suture, the front edge of the anterior fontanel, eyebrow rides with eye-pits and the bridge of the nose are detected. Neither the mouth nor the chin is detected.

The labor mechanisms

The first cardinal movement of labor is the head descends in the inlet of the true pelvis, the frontal suture is located in the transverse or the slightly oblique diameter.

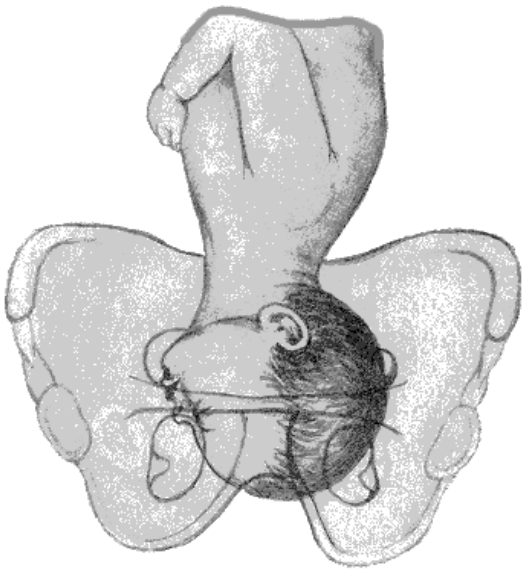


Fig. 9.8. The first cardinal movement of labor

The second cardinal movement of labor is the internal rotation of the head at the pelvic floor provided that the chin is turned to the symphysis and the back of the head is turned to the sacral bone.

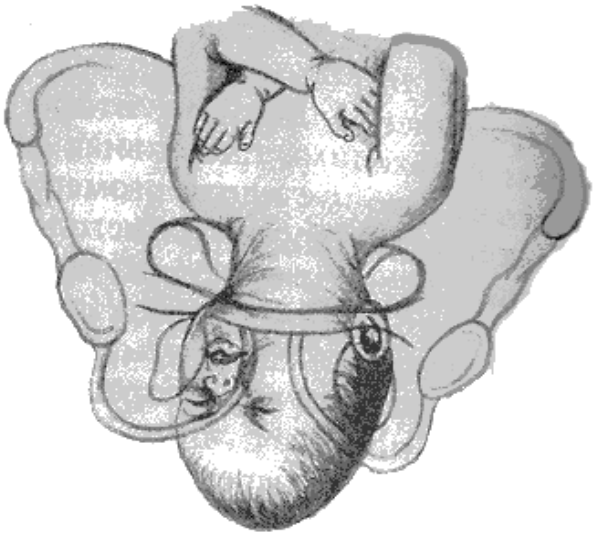


Fig. 9.9. The second cardinal movement of labor

The third cardinal movement of labor is the formation of the first fixation point between the pubic arch and the maxillary bone of fetus. The head is flexed around this point.

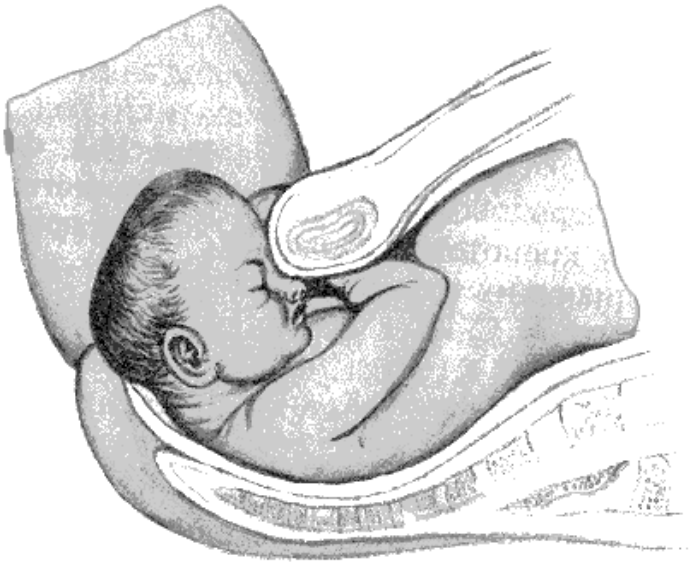


*Fig. 9.10. The third cardinal movement of labo***r**

The fourth cardinal movement of labor is the formation of the second fixation point between the top of the tail bone and the suboccipital fossa. The head is extended around this point.

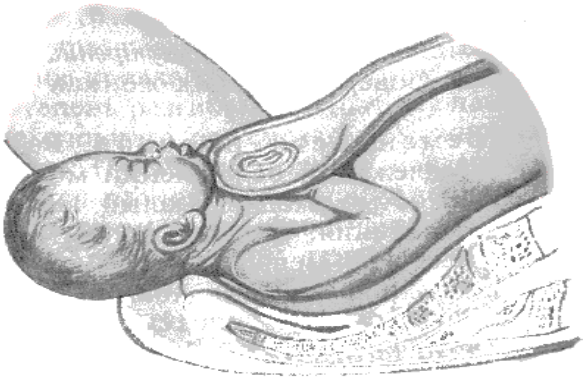


*Fig. 9.11. The fourth cardinal movement of labo***r**

The fifth cardinal movement of labor is the internal rotation of shoulders and the external rotation of the head (the same as in case of the vertex presentation).

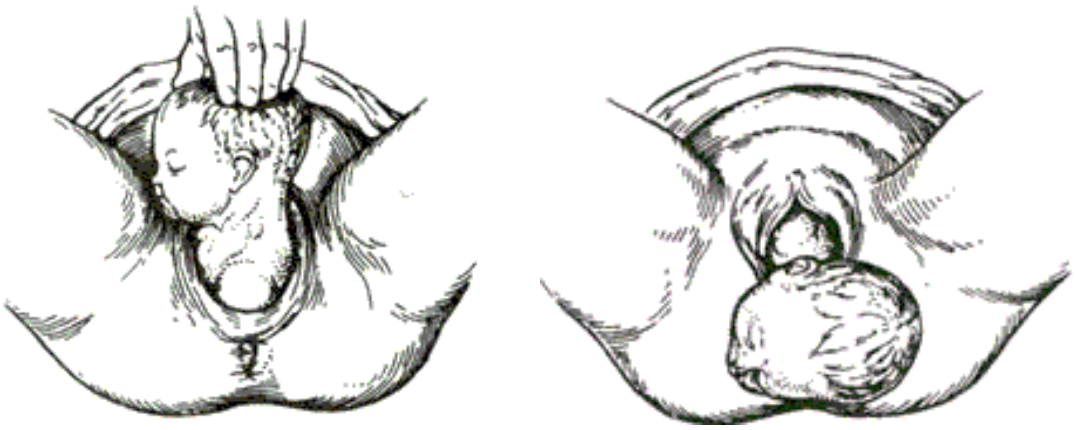


Fig. 9.12. The fifth cardinal movement of labor

The axial point in case of the brow presentation is **the forehead.** The head is crowning through the vulvar ring with the circle which approximately goes through **the maxillary bone and the occipital protuberance** (38-42 cm). The molding of the head is located at the forehead.

The course of the labor in case of the brow presentation is the long-term one and with often traumas of the mother and the newborn baby. That's why the majority of obstetricians consider that in this case of the presentation the caesarian delivery is justified.

The face presentation

The commonly occurring one.

The face presentation more often than not occurs in the labor with the flat pelvis. Usually in the inlet of the true pelvis the brow presentation is formed which converts to the face presentation when the head descends and further extends.

The axial point is **the chin.** If the chin of the fetus is turned forward, then it is the so-called mentoanterior presentation; if the chin of the fetus is turned backward, then it is the so-called mentoposterior presentation.

The labor mechanisms

The first cardinal movement of labor is the maximum extension of the head over the inlet of the true pelvis. The face stature is placed in the transverse or the slightly oblique diameter of the inlet of the true pelvis.

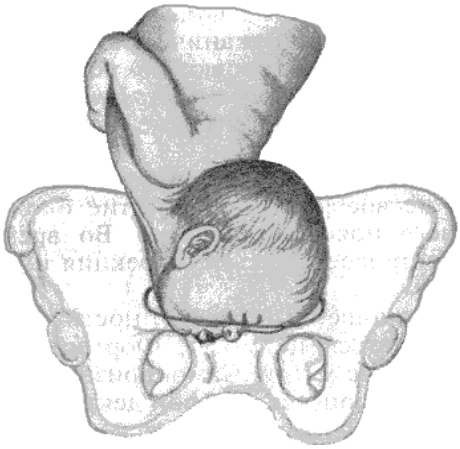


Fig. 9.13. The first cardinal movement of labor

The second cardinal movement of labor is the internal rotation of the head only at the pelvic floor. The chin is turned forward.

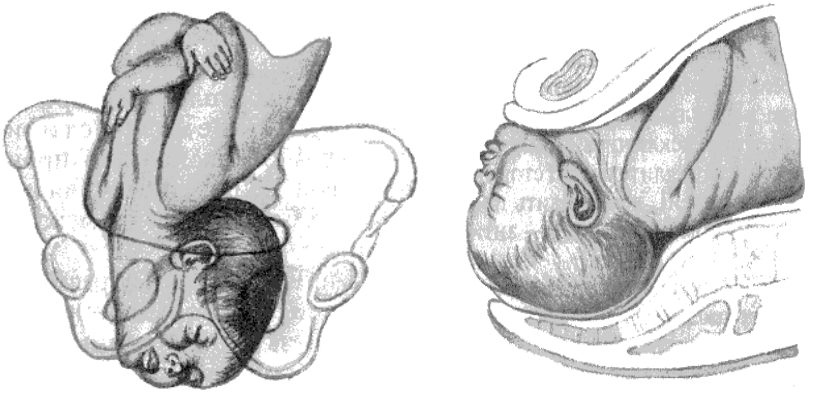


Fig. 9.14. The second cardinal movement of labor

The third cardinal movement of labor is the formation of the fixation point between the lower edge of the pubic and the lingual bone of the fetus. The head is flexed around this point.

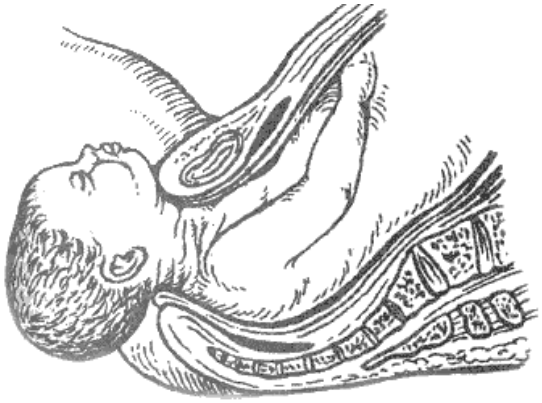


Fig. 9.15. The third cardinal movement of labor

The fourth cardinal movement of labor is the internal rotation of shoulders and the external rotation of the head.

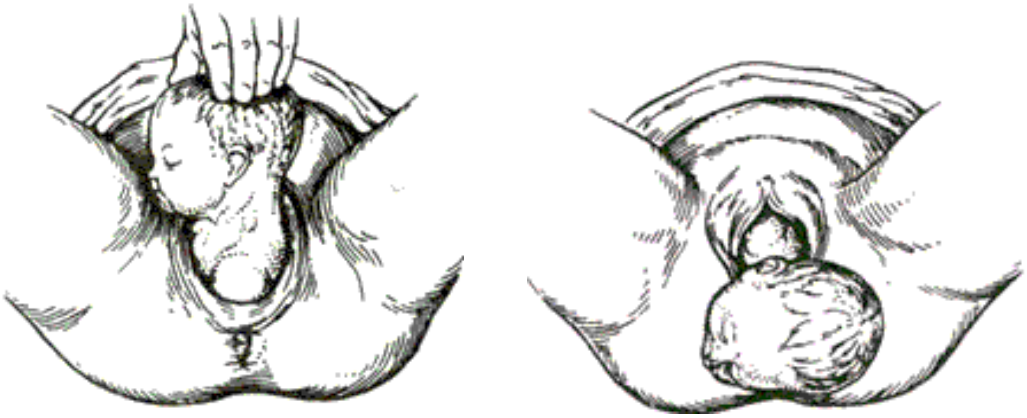


Fig. 9.16. The fourth cardinal movement of labor

In case of the face presentation the head is crowning with the circle corresponding to the **submentobregmatic diameter** and equal to (32 cm).

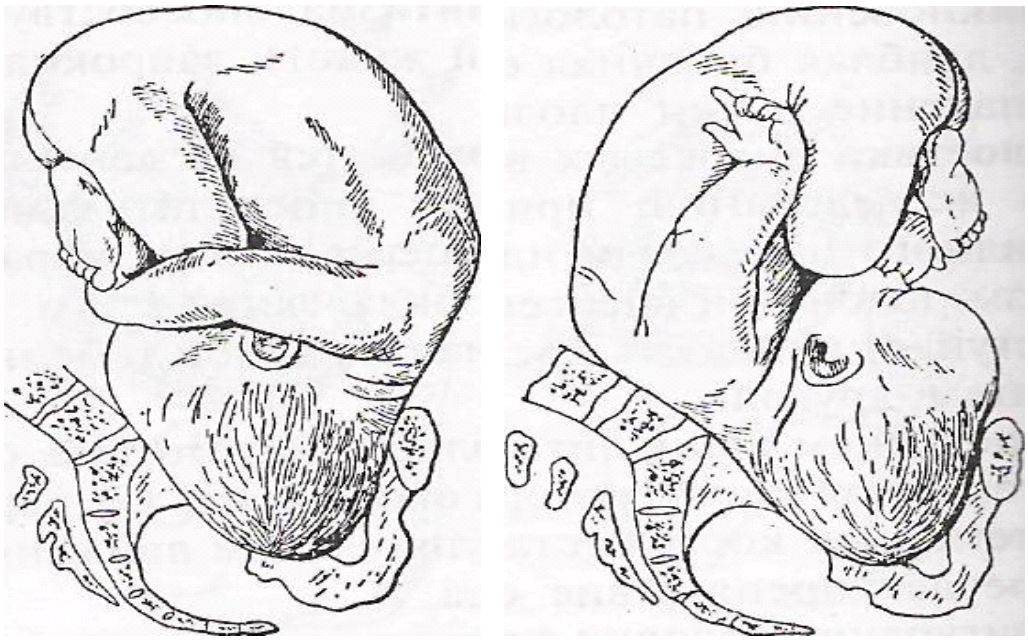
The diagnosis of the face presentation can be truly made only during the vaginal examination when the chin, the nose, eyebrow rides and the frontal suture are detected. If the face edema is significant, the wrong diagnosis can be made for example the breach presentation instead of the face one.

The course of the labor. The labor is a long-term one. Very often premature (early) rupture of membranes occurs. The course of the labor is especially unfavorable in case of the so-called mentoposterior presentation.

In case of the mentoposterior presentation when the chin is turned to the tail bone and the forehead is turned to the symphysis, the descent of the head is arrested because the head shall go through the pelvis together with the chest. The diameter of the head together with the chest is not consistent with sizes of the pelvis. That's why the vaginal delivery in case of **the mentoposterior presentation** is impossible. **The caesarian delivery** is justified.

Engagement abnormalities

The high anteroposterior station of the head is when the sagittal suture is located in the **occipitofrontal diameter** of the inlet of the true pelvis. This pathology commonly occurs in case of contracted pelvises (the dollichopellic pelvis). The course of the labor in case of the high straight station of the head is usually the long-term one; with the often-occurred hypoxia, intracranial trauma and with the hazard of the birth trauma in the mother.



Anterior Posterior

Fig. 9.17. The high anteroposterior station of the head

In case of the high anteroposterior station of the head the gravida shall be followed up for the early recognition of cephalopelvic disproportion and the early resolution of the issue related to the caesarean section.

The low transverse station of the head is the position of the head with the sagittal suture in the transverse diameter of the pelvic cavity (medium transverse station of the head) or even its overrun (the low or deep transverse station of the head).

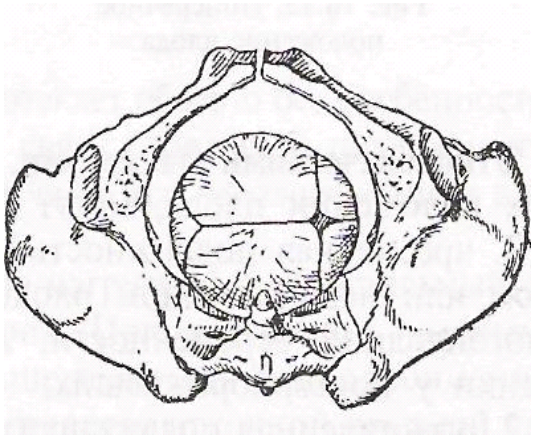
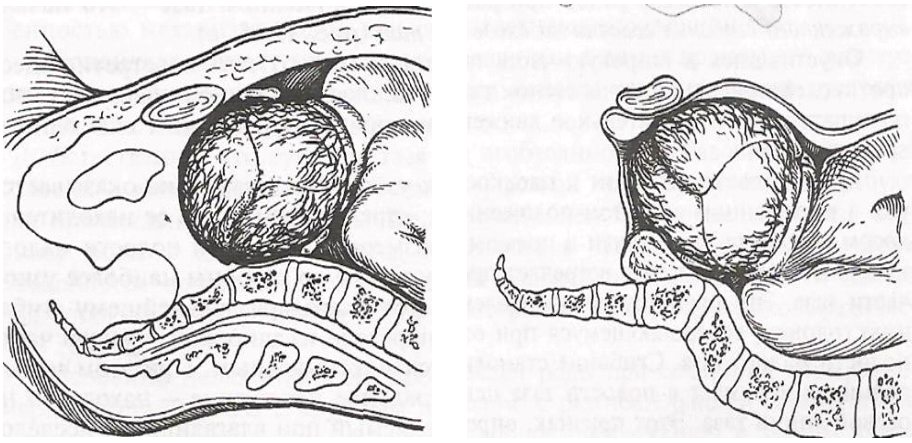


Fig. 9.18. The low transverse station of the intraparietal suture

This pathology commonly occurs in case of flat pelvises. The gravida rarely finishes the delivery unassisted. It is recommended to carry out the caesarean section in the interest of both the mother and the fetus.

The asynclitic engagement is the extra-axial engagement when the sagittal suture deviates from the neutral position either to the promontory (the anterior asynclitism) or to the pubic (the posterior asynclitism).



Anterior Posterior

Fig. 9.19. Types of the asynclitism

Asynclitic engagements occur in case of contracted pelvises (commonly occurring in case of the flat rachitic pelvis). If the asynclitic ratio is negligible, the labor will be vaginal. The expressed anterior asynclitism and the expressed posterior asynclitism are pathological phenomena. That is why the cesarean delivery is justified.

Challenge questions and samples of answers:

1. What are the three head deflection degrees?

The sample of the answer:

1 degree - the bregmatic presentation;

2 degree - the brow presentation;

3 degree - the face presentation.

2. What is the etiology of the fetal head deflection and abnormal head engagements?

The sample of the answer:

- the insufficiency of the lower segment of the uterus,
- the contracted pelvis, especially the flat one,
- the hydramnios,
- the multifetation,
- the premature (early) rupture of membranes,
- the kyphosis of the mother's spine,
- the insufficiency of the anterior abdominal wall (the soft and the pendulous abdomen) and of the pelvic floor,
- submucous myomas of the uterus,
- the low insertion of the placenta,
- very big or vice versa very small head of the fetus,
- the loss of its usual elasticity by the fetus (the still birth),
- the congenital tumor of the thyroid body of the fetus;
- the ankylosis of the occipitoatlantoid joint,
- the short umbilical cord.

3. What are diagnostic methods of the fetal head deflection and abnormal head engagements?

The sample of the answer:

a) the external examination;

b) the auscultation of heartbeats of the fetus;

c) the vaginal examination.

4. What are the key aspects of the labor mechanisms in case of the bregmatic presentation?

The sample of the answer:

a) the moderate extension of the head;

b) the internal wrong rotation of the head;

c) the flexion of the head;

d) the extension of the head;

e) the internal rotation of the shoulders and the external rotation of the head.

5. What is the axial point in case of the bregmatic presentation?

The sample of the answer: The anterior fontanel.

6. What are fixation points in case of the bregmatic presentation?

The sample of the answer: The bridge of the nose, the occipital protuberance.

7. What is the head crowning circle in case of the bregmatic presentation?

The sample of the answer: The circle corresponding to the **occipitofrontal diameter** of the head - 34 cm.

8. What are the key aspects of the labor mechanisms in case of the brow presentation?

The sample of the answer:

a) the average head extension degree;

b) the internal wrong rotation of the head;

c) the flexion of the head;

d) the extension of the head;

e) the internal rotation of the shoulders and the external rotation of the head.

9. What is the axial point in case of the brow presentation?

The sample of the answer: The forehead.

10. What are fixation points in case of the brow presentation?

The sample of the answer: The maxillary bone, the suboccipital fossa.

11. What is the head crowning circle in case of the brow presentation?

The sample of the answer: The circle going through the verticomental diameter - 38-42 cm.

12. What are key aspects of the labor mechanisms in case of the brow presentation?

The sample of the answer:

a) the maximum extension of the head;

b) the internal rotation of the head with the back of the head posterior;

c) the flexion of the head;

d) the internal rotation of the shoulders, the external rotation of the head.

13. What is the axial point in case of the face presentation?

The sample of the answer: The chin.

14. What is the fixation point in case of the face presentation?

The sample of the answer: The lingual bone.

15. What is the head crowning circle in case of the face presentation?

The sample of the answer: The circle corresponding to the **submentobregmatic diameter** – 32cm.

16. What part of the fetus is used for detecting the type of the face presentation?

The sample of the answer: The chin.

17. What are distinctive features of the face presentation and the breach presentation?

The sample of the answer: Eyebrow rides, eye-pits, the nose and the mouth are detected in case of the face presentation. The tail bone, the sacral bone and the anus are detected in case of the breach presentation.

18. What are complications of the labor in case of the defection of the fetal head?

The sample of the answer:

a) the long-term labor;

b) the asphyxia of the fetus;

c) the traumatism of the mother and the fetus.

19. What are preventative measures of complications of the labor in case of defection of the fetal head?

The sample of the answer:

a) the timely diagnostics of the defection of the fetal head;

b) the selection of the rational labor method.

20. What is the definition of the term "the head engagement"?

The sample of the answer: The ratio between the intraparietal suture, the promontory and the upper edge of the pubic.

21. What types of the head engagements do you know, please describe?

The sample of the answer:

a) synclitic and asynclitic;

b) the synclitic engagement is the location of the intraparietal suture at equal distances from the promontory and the pubic.

v) the asynclitic engagement is the deviation of the intraparietal suture to the pubic or to the promontory.

22. What is the anterior asynclitism?

The sample of the answer: The deviation of the intraparietal suture to the promontory leading to the insertion of the anterior parietal bone into the cavity of the true pelvis.

23. What is the posterior asynclitism?

The sample of the answer: The deviation of the intraparietal suture to the pubic leading to the insertion of the posterior parietal bone into the cavity of the true pelvis.

24. What are degrees of the posterior asynclitism?

The sample of the answer: The posterior parietal inclination, the posterior parietal insertion, the posterior aural presentation.

25. What is the forecast of the course of labor in case of various degrees of the asynclitic insertion?

The sample of the answer: It is possible to deliver through the birth canal in case of the posterior parietal inclination. It is impossible to deliver through the birth canal in case of the posterior parietal insertion and the posterior aural presentation.

26. How can the high anteroposterior station of the head be understood?

The sample of the answer: The location of the head with the intraparietal suture in **occipitofrontal diameter** but in the inlet of the true pelvis.

27. What is the low transverse station of the intraparietal suture?

The sample of the answer: The location of the head of the fetus with the intraparietal suture in the transverse diameter of the inlet of the cavity of the true pelvis.

The student shall know:

1. What is the presentation? Types of cephalic presentations.
2. What is the engagement? Types of engagements of the head.
3. Causes of deflection of the fetal head.
4. Deflection degrees of the fetal head.
5. The bregmatic presentation, its diagnostic signs.
6. Cardinal labor movements in case of the bregmatic presentation.
7. The axial point, fixation points, the head crowning circle in case of the bregmatic presentation.
8. Configuration features of the head, the clinic, the outcome of the labor in case of the bregmatic presentation.
9. The brow presentation, diagnostic criteria during the external examination and the internal examination.
10. Key aspects of the labor mechanisms in case of the brow presentation.

11. The axial point, fixation points, the head crowning circle in case of the brow presentation.

12. Configuration features of the head, the clinic, the outcome of the labor and the management of the labor in case of the brow presentation.

13. The face presentation, diagnostic criteria during the external examination and the internal examination, the detection of the type of the fetus in case of the face presentation.

14. Key aspects of the labor mechanisms in case of the face presentation.

15. The axial point, fixation points, the head crowning circle in case of the face presentation.

16. Configuration features of the head, features of the clinic and the outcome of the labor in case of the face presentation.

17. Possible labor complications in case of the deflection of the fetal head.

18. The high anteroposterior station of the head: the causes, the diagnostics, the course of the labor and the management of the labor.

19. The medium and low the low transverse station of the intraparietal suture; the causes, the diagnostics, the course of the labor and the management of the labor.

20. The definition of the term, causes and degrees of the anterior asynclitism.

21. The definition of the term, causes and degrees of the posterior asynclitism.

22. The diagnostics of asynclitic insertions.

23. The clinic, the course of the labor and the management of the labor in case of asynclitic insertions.

The student shall know how to:

1. Detect landmarks of the true pelvis using the phantom.

2. Detect landmarks of the head of the fetus using the phantom.

3. Detect various types and degrees of deflection and extension of the fetal head and the stage of the labor mechanisms using the phantom.

Questions for the self-preparation:

- What are the causes of the deflection and engagements of the fetal head.
- Asynclitic engagements of the fetal head: features of the course of the labor and the management of the labor.
- Delivery methods in case of deflection of the fetal head.
- Delivery methods in case of asynclitic engagements of the fetal head.

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