



СЕЧЕНОВСКИЙ УНИВЕРСИТЕТ

Федеральное государственное автономное образовательное учреждение высшего образования Первый Московский государственный медицинский университет имени И.М. Сеченова
Министерства здравоохранения Российской Федерации
(Сеченовский Университет)

УЧЕБНИК

АКУШЕРСТВО И ГИНЕКОЛОГИЯ

Учебник в 4 томах

И.С. Сидорова, Н.А. Никитина

Том II

ПАТОЛОГИЧЕСКОЕ АКУШЕРСТВО



SECHENOV UNIVERSITY

Федеральное государственное автономное образовательное
учреждение высшего образования Первый Московский
государственный медицинский университет имени И.М. Сеченова
Министерства здравоохранения Российской Федерации
(Сеченовский Университет)

TEXTBOOK

OBSTETRICS AND GYNECOLOGY

Textbook in 4 volumes

I.S. Sidorova, N.A. Nikitina

Volume II

OBSTETRIC PATHOLOGY

Министерство науки и высшего образования РФ

Рекомендовано Координационным советом по области образования
«Здравоохранение и медицинские науки» в качестве учебника для использования
в образовательных учреждениях, реализующих основные профессиональные
образовательные программы высшего образования по направлению подготовки
специалитета по специальности 31.05.01 «Лечебное дело»

Регистрационный номер рецензии 1087 от 02 июля 2020 года



Moscow
«GEOTAR-Media»
PUBLISHING GROUP
2021

CONTENTS

Chapter 1. Breech presentation	11
1.1. Definition. General considerations	11
1.2. Causes, classification and diagnostics of breech presentation	12
1.3. Management of pregnancy with breech presentation	16
1.4. Cesarean section	20
1.5. Vaginal delivery in breech presentation	21
1.6. Manual maneuvers and surgeries in breech presentation	26
1.7. Examination of the newborn	33
1.8. Maternal complications after breech delivery	34
1.9. Fetal and neonatal complications after breech delivery	34
Chapter 2. Pregnancy loss. Preterm labor	36
2.1. Definition. Classification	36
2.2. Spontaneous abortion (miscarriage)	36
2.2.1. Main causes of spontaneous abortion	37
2.2.2. Clinical classification. Diagnosis. Treatment	39
2.3. Recurrent pregnancy loss	47
2.3.1. Cervical insufficiency	48
2.3.2. Endocrine causes of miscarriage	51
2.3.3. Infectious causes of recurrent pregnancy loss	52
2.4. Preterm labor	53
2.4.1. Causes and risk factors of preterm labor	55
2.4.2. Prevention of preterm labor	56
2.4.3. Clinical signs and diagnosis of preterm labor	58
2.4.4. Management of preterm labor.	
Prevention of fetal respiratory distress syndrome.	
Current guidelines	62
2.4.5. Delivery	70
2.4.6. Preterm prelabor rupture of membranes	71
Chapter 3. Multiple pregnancy	76
3.1. Definition. Etiology. Classification	76
3.2. Placentation in multiple pregnancy. Determining the twin zygosity	82
3.2.1. Placentation in multiple pregnancy	82
3.2.2. Determining the twin zygosity	83
3.3. Diagnosis of multiple pregnancy	85

3.4. Course of pregnancy. Complications	89
3.4.1. Fetal malformations in multiple pregnancy	90
3.5. Management of multiple pregnancy	94
3.6. Course and management of labor in multiple pregnancy	98
Chapter 4. Isoserological incompatibility of mother and fetus.	
Hemolytic disease of a fetus and a newborn. Current guidelines	101
4.1. Definition. Etiology. Classification	101
4.2. Rhesus isoimmunization. Risk factors of isoimmunization	103
4.2.1. Isoimmunization risk factors	104
4.3. Nature of immunological conflict	105
4.4. Role of maternal sensitization. Maternal protective mechanisms against isoimmunization	108
4.4.1. Protective mechanisms against isoimmunization	108
4.5. Clinical signs and complications of immune conflict pregnancy. Management of a rhesus-negative pregnant women at women's health clinic.	109
4.5.1. Clinical picture and complications	109
4.5.2. Management of pregnant women	110
4.6. Diagnostics of rhesus-isoimmunization and fetal hemolytic disease (FHD)	111
4.6.1. HDF diagnosis	112
4.7. Hemolytic disease of the newborn (HDN)	114
4.8. Treatment of fetal hemolytic disease and HDN	116
4.9. Delivery	118
4.9.1. Patient information	119
4.10. Prevention of rhesus-isoimmunization	119
Chapter 5. Placental insufficiency.	
Hypoxia and intrauterine growth restriction.	122
5.1. Definition. Epidemiology. Classification	122
5.2. Risk factors, pathogenesis of PI and IUGR. Types and grades of IUGR	124
5.3. Diagnosis of PI (hypoxia and IUGR)	129
5.4. Management of pregnant women with PI	137
5.5. Treatment and prevention of PI	138
5.6. Delivery. Pre-conception care	138
5.7. Neonatal asphyxia	139

Chapter 6. Preeclampsia and eclampsia. Current concepts of management and delivery	141
6.1. Basic concepts of etiopathogenesis of preeclampsia	142
6.1.1. Placental ischemia concept	142
6.1.2. Immunological concept. Genetic aspects	144
6.1.3. Endothelial dysfunction as central link of preeclampsia development	146
6.2. Specific features of preeclampsia (<i>I.S. Sidorova</i>)	149
6.3. Risk factors of preeclampsia	150
6.4. Clinical signs and diagnostics of preeclampsia	151
6.4.1. Edema	151
6.4.2. Arterial hypertension	153
6.4.3. Proteinuria	154
6.4.4. Other clinical manifestations of preeclampsia	154
6.5. Current classification of preeclampsia	156
6.6. Complications of preeclampsia	158
6.7. Eclampsia. HELLP syndrome	159
6.7.1. Eclampsia	159
6.7.2. HELLP syndrome	167
6.8. Prevention of preeclampsia	171
6.9. Management of preeclampsia and eclampsia. Clinical guidelines ..	172
6.9.1. Basic therapy of preeclampsia	174
Chapter 7. Abnormal labor	183
7.1. General considerations. Classification	183
7.2. Pathogenesis and main causes of abnormal labor	184
7.3. Pathological preliminary period as a precursor of labor abnormality	188
7.4. Primary uterine inertia	190
7.5. Oxytocin-stimulated labor	193
7.5.1. Treatment regimen for primary uterine inertia	194
7.6. Secondary uterine inertia	196
7.7. Rapid and precipitous labor (oxytocia)	199
7.8. Labor dystocia	202
Chapter 8. Obstetric hemorrhage in pregnancy and labor	213
8.1. Definition. Classification of obstetric hemorrhage	213
8.2. Hemorrhage in placenta previa	214
8.2.1. Definition, classification, etiology of placenta previa	214

8.2.2. Clinical presentations of hemorrhage in placenta previa	216
8.2.3. Diagnosis of placenta previa	218
8.2.4. Management of pregnant women and special features of delivery	220
8.3. Hemorrhage in premature separation of normally located placenta, placental abruption	225
8.3.1. Definition, classification, etiology and pathogenesis of placental abruption	225
8.3.2. Main clinical signs of placental abruption	229
8.3.3. Algorithm of actions in placental abruption	232
8.3.4. Management of women with placental abruption during pregnancy and delivery	233
8.4. Hemorrhage in the third stage of labor and early postpartum period	234
8.4.1. Impairments of placental separation and delivery	234
8.4.2. Hypotonic hemorrhage in the early postpartum period	239
8.5. Injuries of soft tissues of the birth canal	243
8.6. Clinical protocol for prevention and treatment of postpartum hemorrhage	244
8.6.1. Definition	244
8.6.2. Causes	244
8.6.3. Preventive measures	245
8.6.4. Algorithm of actions in hemorrhage	246
8.6.5. Distribution of responsibilities of medical personnel in case of postpartum hemorrhage	252
8.6.6. Technique of uterine tamponade in hypotonic hemorrhage in the early postpartum period using Zhukovsky uterine balloon catheter	254
8.7. Intraoperative reinfusion of autologous red blood cells (clinical protocol)	255
8.8. Hemorrhagic shock	258
Chapter 9. Contracted pelvis in modern obstetrics	260
9.1. Definition. Characteristics. Classification	260
9.2. Anatomically contracted pelvis	262
9.2.1. Types and degrees of anatomically contracted pelvis	262
9.2.2. Causes of anatomically contracted pelvis	264
9.2.3. Diagnosis of contracted pelvis	265
9.2.4. Radiologic imaging of contracted pelvis	269

9.2.5. Anatomical characteristics and biomechanism of labor in different types of contracted pelvis	272
9.2.6. Rare shapes of anatomically contracted pelvis	283
9.2.7. Prediction of outcome in anatomically contracted pelvis . . .	284
9.2.8. Features of pregnancy course and management.	285
9.2.9. Management of labor in anatomically contracted pelvis (clinical guidelines).	286
9.3. Clinical cephalopelvic disproportion. Labor management	291
Chapter 10. Delivery with deflexed cephalic presentation, incorrect engagement and fetal malpresentation	299
10.1. General considerations	299
10.2. Labor with deflexed cephalic presentation	299
10.3. Other causes of clinical cephalopelvic disproportion	307
10.4. Shoulder dystocia	310
10.5. Labor in fetal malpresentation	312
Chapter 11. Traumatic birth	314
11.1. Vaginal and vulvar lacerations	314
11.2. Perineal lacerations	316
11.3. Cervical lacerations	321
11.4. Uterine rupture	323
11.4.1. Overview, historical and current views on uterine rupture . .	323
11.4.2. Classification of uterine ruptures	329
11.4.3. Clinical signs, diagnostics and treatment of uterine rupture . .	330
Chapter 12. Pregnancy and genital infections	340
12.1. Bacterial vaginosis in pregnancy	340
12.2. Pregnancy and infection caused by group B Streptococcus	343
12.3. Urogenital candidiasis in pregnancy	345
12.4. Toxoplasmosis and pregnancy	348
12.5. Intrauterine infections	352
12.6. Perinatal viral infections	364
12.6.1. Genital herpes in pregnancy	369
12.6.2. Rubella and pregnancy	372
12.6.3. Cytomegalovirus infection and pregnancy	374
12.6.4. HIV-infection and pregnancy	374
Chapter 13. Abnormalities of postpartum period.	
Non-infectious and infectious diseases of postpartum period	379
13.1. Non-infectious postpartum diseases	379

13.2. Postpartum infections (pyoinflammatory diseases).

Current clinical guidelines 381

13.2.1. Definition. Historical background. Classification. Etiology.
Pathogenesis 381

13.2.2. Postpartum endometritis (metroendometritis) 387

13.2.3. Peritonitis 393

13.2.4. Sepsis and septic shock. 401

13.2.5. Lactational mastitis 408

13.2.6. Prevention of postpartum pyoinflammatory diseases 414

Chapter 1

BREECH PRESENTATION

1.1. DEFINITION. GENERAL CONSIDERATIONS

Breech presentation is a **fetal malpresentation**, where the buttocks or lower extremities of the fetus *present* in the pelvic inlet *and appear first when moving along through the birth canal*. This creates many difficulties in labor and leads to numerous complications, since the diameters of the pelvic pole are much smaller than the diameters of the fetal head.

Currently, delivery in breech presentation is not considered pathological. Still, among children born in breech presentation general morbidity is somewhat higher, long-term unfavorable consequences of birth trauma (paresis, mental development retardation, epilepsy) are more common. On the maternal side, there can occur such complications as birth canal laceration, abnormal labor, postpartum infectious disease.

Unfavorable perinatal outcomes are due to the fact that the pelvic pole, the smaller part of fetus, is the first to pass through the birth canal and be delivered, followed by the larger head, delivering which can cause difficulties.

Perinatal mortality and morbidity in fetuses born in breech presentation is higher due to prematurity, congenital development anomalies, birth trauma and asphyxia.

Providing prenatal and intranatal care in breech presentations requires profound knowledge and high professional skills to provide qualified assistance to the mother and fetus. Over the last 30 years there has been a worldwide trend to deliver cases of breech presentation by cesarean section.

Prevalence of breech presentations for the last several decades remains constant, at about 3–4% on the average. This is primarily due to multiple causes of breech presentation, which are most often impossible to eliminate.

1.2. CAUSES, CLASSIFICATION AND DIAGNOSTICS OF BREECH PRESENTATION

The **causes** of breech presentation are varied, numerous and insufficiently studied. These include:

1. Obstruction for the insertion of the head in the pelvic inlet:

- ▶ in uterine fibroids;
- ▶ anatomically contracted pelvis and abnormal pelvic shape;
- ▶ placenta previa and low-lying placenta.

2. Abnormal uterine tone. This can manifest as pathological hypertone of the lower segment and hypotonic superior segments. At the same time, fetal head, as the largest and the densest part, is pushed out from the pelvic inlet and is positioned in the upper part of the uterine cavity. Such abnormalities of the uterine tone in the third trimester may be caused by changes in myometrium due to its structural impairment after inflammatory diseases, repeated curettage, multiple pregnancies and complicated labor, as well as in multiparous women.

3. Fetal hyper/hypo-mobility:

- ▶ preterm labor;
- ▶ polyhydramnios, oligohydramnios;
- ▶ low fetal body weight;
- ▶ prematurity or IUGR;
- ▶ multiple pregnancy;
- ▶ various changes in uterine shape due to developmental malformations (bicornuate, arcuate uterus, uterine septum);
- ▶ entanglement of umbilical cord around different parts of fetal body;
- ▶ short umbilical cord.

Classification. There are the following types of breech presentations: breech presentation (frank and complete) and footling presentation (fig. 1.1).

Breech presentations are classified as follows:

- ▶ frank breech presentation, when fetal buttocks are aiming towards the pelvic inlet, legs are parallel with the trunk (incidence: 63–75%);
- ▶ complete breech presentation (flexed breech): fetal buttocks and legs, flexed in hip and knee joints, are aiming towards the pelvic inlet (incidence: 20–24%).

Footling presentations (incidence: 11–13%) are subdivided into the following:

- ▶ complete — both legs are the presenting part in the birth canal;
- ▶ incomplete — one leg is the presenting part in the birth canal;



Fig. 1.1. Types of breech presentations: a — frank breech presentation; b — complete breech presentation; c — footling breech presentation

- kneeling breech presentation — fetal knees are the presenting part in the birth canal (incidence 0.3%).

Footling presentation develops only during labor after the rupture of membranes.

Classification of breech presentations is based on the features of labor bio-mechanism in each variant, as well as different size of presenting parts, which is followed by fetal trunk and head. If in case of *frank breech presentation* of a small fetus and normal pelvis size in woman, normal vaginal delivery is pos-

sible without complications, in complete breech and footling presentations the prognosis for fetal life and health worsens significantly.

Footling presentation is the most unfavorable due to the high occurrence of such complications as asphyxia, prolapse of the umbilical cord or small body parts of the fetus during labor.

Diagnosis. During physiological pregnancy the fetus assumes a position with a head down by 22–24 weeks gestation, adapting to the uterus shape. However, this position remains unstable for the ensuing 11–13 weeks. Within this period uterine contractions are asynchronous; they occur with high frequency and low amplitude, with multidirectional contractions of different uterine zones. Such type of contractions preserves the obturative function of the internal os, promotes optimization of myometrial and uteroplacental blood flow. The fetus may frequently change position, even within a day. The final positioning of the fetus at the pelvic inlet takes place by 34–35 weeks. By that time, uterine contractions become more *synchronous*; the sympathetic part of the autonomous nervous system prevails over parasympathetic. This contributes to the increase in functional capabilities of the uterine fundus and body. Contractions of longitudinal and oblique smooth muscular fascicles intensify, with simultaneous relaxation of transverse, circular and spiral fascicles in myometrium. If by 34–35 weeks, the fetus is set in breech presentation, it is strongly predictive of breech delivery.

Diagnostics of breech presentations is based, first of all, on the findings of external obstetric examination and vaginal examination, as well as ultrasound data.

External obstetric examination. Large fundal height is characteristic for breech presentations.

External examination (four Leopold's maneuvers) allows suspecting breech presentation. During the first maneuver, a dense, round-shaped, balloting head is determined at the uterine fundus, often displaced to the right or left from the abdominal midline. During the second maneuver, fetal back is palpated on one side of the abdomen, with small parts on the other. During the third maneuver, a large irregular presenting part is palpated above or in the pelvic inlet, soft in consistency, without balloting. The fourth maneuver is used for clarify the relation of the presenting part to the pelvic inlet.

Fetal heart beat is heard more clearly at the level of the navel or above, on the left or right, depending on the position. To confirm breech presentation and to establish the type of presentation, *vaginal examination* is recommended.

In vaginal examination of a pregnant woman, a large, soft presenting part is palpated through the anterior fornix. During labor when the cervix is dilated 4–5 cm, the inguinal fold, sacrum and coccyx are palpated. One should not attempt to determine fetal gender by palpating external genital organs due to the risk of its trauma. In complete breech and footling presentation, fetal feet are palpated, which differ from the hand by the presence of a calcaneal tuber and short toes, located in a line.

The diagnosis of footling presentation does not present difficulty, as a rule.

Breech presentation should be differentiated from face and brow presentations. In case of prolapse of small fetal parts, hand should be differentiated from feet.

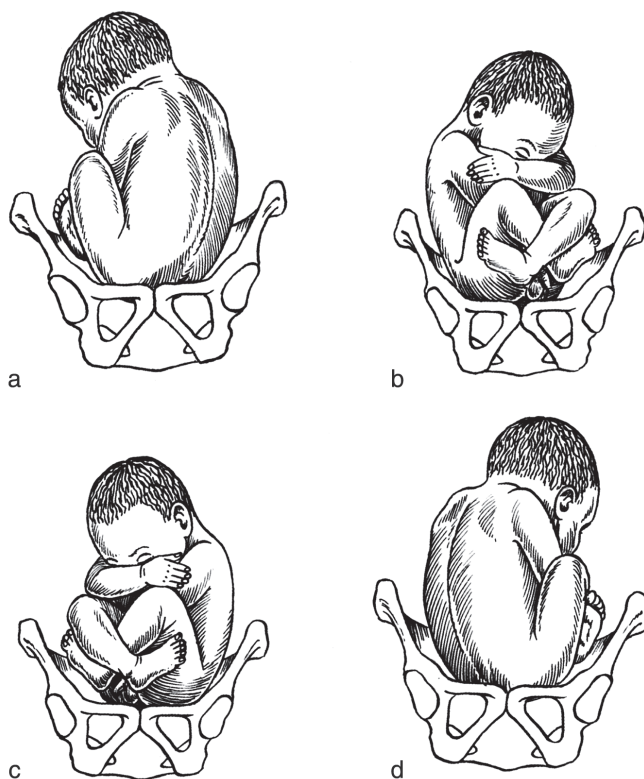


Fig. 1.2. Position variants in breech presentation: a — left (first) sacroanterior position; b — right (second) sacroposterior position; c — left (first) sacroposterior position; d — right (second) sacroanterior position

Position in breech presentation is determined based on the position of fetal sacrum and back, as well as intertrochanteric line. Like in cephalic, in breech presentation we distinguish anterior and posterior view, left (first) and right (second) position of the fetus. Ultrasound is the method providing the most information for diagnostics of breech presentation.

Ultrasound allows a precise identification of both breech presentation and its type, estimated fetal weight, position of the head (flexed, extended), amount of amniotic fluid. Based on the angle between the spine and occiput, there are 4 types of fetal head position: angle $>110^\circ$ — head is in flexed position, $100\text{--}110^\circ$ — grade I extended (military), $90\text{--}100^\circ$ — grade II extended, $<90^\circ$ — grade III hyperextended (“star-gazing fetus”).

1.3. MANAGEMENT OF PREGNANCY WITH BREECH PRESENTATION

Management of pregnant women at the women’s health clinic. Until 28 weeks gestation expectant approach is applicable, as in most cases the fetus assumes cephalic presentation spontaneously. But from 35 weeks it is reasonable to perform corrective exercises.

In patients with high risk of breech presentation occurrence, preventive measures should be taken to avoid disturbances of uterine contractions, macrosomia (big fetus). For this purpose, diet with low content of carbohydrates and, particularly, sugar, is necessary. One of the causes of macrosomia is chronic elevation of blood glucose.

If a breech presentation is diagnosed, corrective exercises, based on normalization of the uterine and anterior abdominal wall muscle tone, when the body position of a pregnant woman lying horizontally is changing, are recommended from 36 weeks (30 weeks in women at high risk). For this purpose, the woman, lying on a hard firm surface, alternately turns on her right and left side for ten minutes 3–4 times a day. Simple postural exercises are effective for version from breech to cephalic presentation in more than 60% of cases.

At a women’s health clinic it is necessary to conduct a comprehensive clinical and laboratory examination, including ultrasound, fetal monitoring, Doppler ultrasound, to assess fetal condition (position, presentation, state of the head — flexed, extended, cord entanglement, fetal gender, assessment of biophysical profile, body weight and its correspondence to gestational age). One should rule out possible fetal and uterine malformations, assess pelvic dimensions in accordance with gestational age. In a number of cases radiopelvimetry is necessary.