METHODICAL POINTING
for the independent work of students for preparation to practical lesson

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Poltava – 2020
Trauma in labor (uterine rupture, puerperal inversion of the uterus, damage to the joints of the pelvis).

Uterine rupture

Uterine rupture (ruptura uteri) is a traumatic injury of the completeness of the organ during pregnancy or labor. Small rupture to the wall of the uterus in early months is called perforation either instrumental or perforating hydatidiform mole. Rupture of a rudimentary pregnant horn has got a special clinical entity and is grouped in ectopic pregnancy. Uterine rupture is rather serious obstetric pathology, accompanied by invalidization and high maternal and perinatal mortality: maternal mortality in uterine rapture accounts for 12-18 %, fetal death accounts for 35-40%. The prevalence widely varies from 1 in 2000 to 1 in 200 deliveries.

Etiology and pathogenesis

Uterine lacerations typically occur during labor and less frequently during pregnancy.

The risk group for uterine rupture during pregnancy:

- pregnant women with scarred uterus;
- multiparous pregnant women;
- the dilatation and curettage operation or manual removal of placenta;
- congenital malformation of the uterus (bicornuate variety) is a rare possibility;
- in Couvelaire uterus;
- injudicious administration of oxytocin;
- use of prostaglandins for induction of abortion or labor;
- forcible external version specially under general anesthesia;
- fall or blow on the abdomen.

The risk group for uterine rupture during labor:

- as above;
- macrosomia;
- overdistension of the uterus (polyhydramnios, multiple fetation);
- breech presentation;
- malpositions, such as brow;
• anatomical alterations of the cervix (scars, deformations);
• uterine myomas that block the pelvic inlet
• morphological changes of the myometrium (degenerative and inflammatory processes after abortion, surgery, curettage; infantilism, etc.)
  o Internal podalic version - specially following obstructed labor
  o Destructive operation
  o Manual removal of placenta
  o Application of forceps or breech extraction through incompletely dilated cervix
  o Injudicious administration of oxytocin for augmentation of labor.

Spontaneous rupture which occurs predominantly in an otherwise intact uterus during labor is due to:

• **Obstructive rupture** - This is the end result of an obstructed labor. The rupture involves the lower segment and usually extends through one lateral side of the uterus to the upper segment.

• **Non-obstructive rupture** - Grand multiparae are usually affected and rupture usually occurs in early labor. Weakening of the walls due to repeated previous births as mentioned earlier may be the responsible factor. The rupture usually involves the fundal area and is complete.

• The classical or hysterotomy scar is more vulnerable to rupture during labor. Although rare, lower segment scar predominantly ruptures during labor.

**Classification of uterine lacerations.**

1. **By pathogenesis:**
   1. Spontaneous uterine rapture:
      • morphological changes of the myometrium;
      • mechanical obstacle to fetal birth;
      • combination of morphological changes of the myometrium and mechanical obstacle to fetal birth.
2. Traumatic uterine rupture (iatrogenic, forced): mixed (in instrumental delivery along with morphological changes of the myometrium).


II. By the clinical course:
1. Risk for uterine rupture.
2. Impending uterine rupture.
3. Actual uterine rupture.

III. By the nature of the injury:
1. Incomplete rupture.
2. Complete rupture (fig.21).

IV. By localization:
1. Laceration in the lower uterine segment:
   • anterior wall tear;
   • lateral tear;
   • posterior wall tear;
   • separation of the uterus from the vaginal fornices.
2. Laceration in the uterine body:
   • anterior wall tear;
   • posterior wall tear.
3. Laceration in the uterine fundus.

Fig.21 Complete uterine rupture

Clinical picture of the uterine rupture
Clinical manifestations of the uterine rupture depends on the stage of pathological process and pathogenetic mechanism of its development. **Risk for uterine rapture** is defined as the process, which precedes the clinical signs of the impending uterine rupture, more common for women with high risk for uterine rupture

*Symptoms of anatomofunctional imperfection of the scar:*
- pain in the lower segment;
- pain on palpation of the lower segment through the anterior vaginal fornix, its heterogeneity, immersion (dipping);
- Ultrasonography: the thickness of the lower segment is less than 4,0 mm, cystiform shape.

**Impending uterine rupture during labor.**

*Traditional set of symptoms in cephalopelvic disproportion according to Bandl:*
- frequent, extremely painful crampy contractions;
- the parturient woman is excited, may cry out, anxious, the face is red, the temperature is high, tongue is dry;
- the uterus is tense, lower segment is painful, circular uterine ligaments are tense and painful;
- constriction ring is oblique at the level of the navel or above; the uterus is hourglass-shaped (see fig. 22);
- ineffective uterine action in fetal presentation above the pelvic inlet;
- fetal heartbeat is poorly recorded;
- swollen suprapubic area (edema of the peribladder fat tissue), difficult urination;
- edema of the cervix, vaginal mucosa and perineum;
- positive Henkel-Vasten symptom;
- painful uterus on palpation;
- caput succedaneumon gradually fills up the pelvic cavity.
Fig. 22 Impending uterine rupture constriction ring is oblique at the level of the navel

*Set of symptoms of histopathic (in morphological changes of the myometrium)*
is characterized by the atypical manifestations:

- pathologic “preliminary” period;
- weak uterine action, ineffective augmentation of labor;
- strengthening of the severe abdominal pain between contractions and pushes;
- premature, early bursting of the waters;
- clinical manifestations of infection in labor;
- blood stained urine;
- progressing fetal distress.

**Actual uterine rapture.**

*Traditional clinical signs of uterine rupture in labor:*

- sharp shooting abdominal pain;
- marked erectile phase of shock specific in such condition;
- cessation of uterine contraction;
- progressive symptoms of pain and hemorrhagic shock, clinical symptoms of intraabdominal hemorrhage;
- altered shape of the abdomen (the uterus is contracted and moves aside, separate small parts of the fetus are detected through the anterior abdominal wall);
- external hemorrhage;
- fetal death.

**Signs of the incomplete uterine rapture:**
• fetus is in the uterine cavity;
• cessation of uterine action does not always occur;
• bruise appears near the uterus from the side of laceration;
• the bruise is painful, the pain irradiates to the lower extremities, strong pelvic and lower back pain;
• progressive clinical symptoms of internal hemorrhage and hemorrhagic shock.

**Signs of cesarean section uterine scar rupture:**
• specific history (the time period after cesarean section is than 2 years; purulo-septic complications in the postpartum period; corporeal cesarean section, etc.);
• occurrence of the symptoms of the imperfect uterine scar (positive symptom of the “niche”);
• strong uterine contraction in hypotonic inertia or incoordination of uterine action;
• uterine rupture in the intact fetal sac;
• pain in the area of the scar;
• pain intensifies with the start of labor action and sustains between contractions;
• presenting part of the fetus does not descend; strong pain on scar palpation;
• nausea, vomiting, anxiety;
• signs of fetal distress;
• marked clinical symptomatology in rapture of great uterine vessels;
• uterine rupture on the cesarean section uterine scar is incomplete.

**Signs of uterine rupture in the early postpartum period:**
• moderate or heavy vaginal bleeding;
• no signs of placental abruption;
• marked painfulness of all areas of the abdomen, strong uterine pain on palpation;
• abdominal distention, nausea, vomiting;
• obstructed uterus fundus symptom;
• symptoms of hemorrhagic shock of different severity;
• bruise on the uterine edge on palpation;
• hyperthermia.

Cases of _nondiagnosed uterine rupture_ are happened in the practical medicine, when the pathology is diagnosed on the 2-3 day postpartum in aggravating signs of the obstetric peritonitis.

**Management**

_Cesarean delivery of women with the risk for uterine rupture is indicated in:_

• combination of the narrow pelvis of І-ІІ degree and large-for-date fetus with weigh more than 3800 g;
• malposition;
• narrow pelvis of ІІІ-ІV degree;
• tumors in parturient canal;
• scarred cervix, vagina.
• brow presentation, high, straight sagittal suture;
• clinically contracted pelvis.

**Obstetric management in the signs of impending uterine rapture:**

• labor action is stopped (tocolytics, narcotic or non-narcotic analgesics);
• the parturient woman is transported to the operating theatre;
• cesarean delivery.

_Feature of the cesarean section is bringing out the uterus from the pelvic cavity for detailed revision of the completeness of its walls._

**Treatment of the complete uterine rapture**

Clinical signs of uterine rapture require immediate prompt medical assistance. Transportation of the parturient woman dramatically worsens her state.

The treatment of complete uterine rapture encompasses the _prompt resuscitation actions:_

• immediate antishock therapy with mobilization of the central veins;
surgery encompasses immediate laparotomy, hysterectomy, revision of the abdominal organs, draining of the peritoneal cavity;

- ensuring of the infusion-transfusion therapy, adequate to the volume of blood loss and correction of the hemocoagulative disorders;
- postpartum intensive infusion-transfusion therapy, rehabilitation.

**Indications for organ preservation surgery:**
- incomplete uterine rupture;
- minor complete rupture;
- linear laceration with accurate margins;
- no signs of infection;
- short waterless period;
- uterine contractile force is preserved.

**Indications for hysterectomy:**
- rupture of the uterine body or lower segment, extended to the cervix with mashy margins;
  - rupture of the vascular bundle;
  - impossible to detect the lower edge of the wound;
  - cervical laceration extended to the uterine body.

**Indications for hysterectomy combined with the removal of fallopian tubes:**
- preliminary indications in the prolonged waterless period (more than 10 – 12 hours);
  - manifestations of chorioamnionitis, endometritis;
  - presence of chronic infection.

**In massive hemorrhage the internal iliac arteries are ligated.**

**In big trauma and significant blood loss the ligation of the internal iliac arteries is performed prior to the main operation.**

**Prevention** of uterine rapture is in the pregnancy planning; timely determination of the risk group for uterine rapture; timely hospitalization into obstetric facilities; rational labor management.

**Uterine inversion**
Postpartum uterine inversion is defined as pathological condition when the internal surface of the uterus is turned inside out.

In the obstetric practice the postpartum uterine inversion is extremely rare complications of the third stage of labor.

**Classification**

I. *By the clinico-morphological features:*
   1. Acute (rapid) complete.
   2. Acute (rapid) incomplete (partial).

II. *By the pathogenetic features:*
   1. Spontaneous.
   2. Forced.

**Etiology and pathogenesis.** The major cause of obstetric uterine inversion is the loss of tonus of myometrium. Irrational management of the third stage of labor contributes to the trauma.

**Clinical picture.** The obstetric uterine inversion is accompanied with sudden pelvic pain (collapse), shock, uterine hemorrhage, presence of soft, bright-red, bleeding tumor-like mass between the femurs of the parturient woman.

**Diagnosis.** The inversed uterus can be located in the vagina and extends beyond the pudendal fissure. If the placenta fails to detach, the tumor-like mass contains placenta, fetal membranes, umbilical cord. The diagnosis of incomplete (partial) obstetric uterine inversion is defined more exactly in determination of the uterine fundus height (the uterus under the pubis is not detected). Bivalve vaginal speculum examination confirms the diagnosis and enables differentiation of the complete and incomplete uterine inversion.

**Management.** Principles of management of the acute obstetric uterine inversion are in patient’s recovery from the pain and hemorrhagic shock and uterine reposition. Deep anesthesia is applied. The inversed uterus is washed with lukewarm sol. Furacilini 1:5000. If the placenta fails to detach, it is removed manually. The woman is shifted into Trendelenburg position and uterine reposition is performed (fig.23). In the postpartum period the prevention of purulo-septic complication is
made. Undue professional medical assistance can result in strangulation and gangrene of the prolapsed uterus. This requires hysterectomy through the vagina.

Prevention of the acute obstetric uterine inversion is in the rational management of labor, especially the third stage of labor.

**Symphysis trauma.**

Symphysis rupture during labor is rare, whereas diastasis symphysis pubis occurs more frequently (up to 4%).

**Etiology and pathogenesis.** Hormonal changes in the woman’s body during pregnancy, promoting the softening of cartilage tissue of symphysis predispose the injury to symphysis. Under such conditions, insertion of the fetal head into the inlet of the narrow pelvis, macrosomia, parietal presentation can lead to diastasis symphysis pubis. Forceps application, embryotomy, fetus extraction by the pelvic pole can contribute to the pathology.

**Classification by the severity:**

1. The first-degree diastasis symphysis pubis is 5-9 mm (normal 1,5 mm);
2. The second-degree diastasis symphysis pubis is 10-20 mm;
3. The third-degree diastasis symphysis pubis is wider 20 mm.

**Clinical picture.** Diastasis symphysis pubis is revealed by the pain in the symphysis and lower back within 8-12 hours after childbirth. The pain intensifies in attempts of standing up, walking, and goose gait occur. The puerpera lies on the bed in the non-voluntary position: the legs are bent in coxofemoral and knee joints, hips
are spread apart (Volkovich symptom). Sometimes symphysiolysis are accompanied with injury to uterine bladder, clitoris, etc.

**Diagnosis** is made easily. The degree of diastasis symphysis pubis is measured by the X-ray; ultrasonography.

**The amount of treatment** of the puerpera with symphysiolysis is measured by the degree of diastasis symphysis pubis. Regardless of the severity of the process, bed rest is indicated, B vitamins, D vitamin – 5000 IU three times a day, 0,5 g calcium glycerophosphate three times a day, a balanced complex of macro-and microelements. In case of the first-degree diastasis symphysis pubis bed rest is indicated during 3-4 weeks, which includes alternate body positioning on the left, then on the right side. Pillow filled with sand up to 5 kg is put on the greater trochanter. 2-3 degree diastasis symphysis pubis requires application of hammock-type dressing for 4-6 weeks. If the conservative therapy is ineffective, the surgery will be performed.

**Prevention** of diastasis symphysis pubis is based on the prophylaxis of rachitis and disbalance of macro-and microelement metabolism, physical education of girls, prognosis and rational management of labor.

1. A woman is admitted to maternity home with discontinued labor activity and slight bloody discharges from vagina. The condition is severe, the skin is pale, consciousness is confused. BP is 80/40 mm Hg. Heartbeat of the fetus is not heard. There was a Cesarian section a year ago. Could you please determine the diagnosis?

A. hysterorrhesis  
B. bord presentation  
C. placental presentation  
D. dxpulsion of the mucous plug from cervix uteri  
E. premature expulsion of amniotic fluid

2. A woman is 34 years old, it is her tenth labor at full term. It is known from the anamnesis that the labor started 11 hours ago, labor was active, painful contractions started after discharge of waters and became continuous. Suddenly the parturient got knife-like pain in the lower abdomen and labor activity stopped. Examination
revealed positive symptoms of peritoneum irritation, ill-defined uterus outlines. Fetus was easily palpable, movable. Fetal heartbeats wasn't auscultable. What is the most probable diagnosis?

A. rupture of uterus
B. uterine inertia
C. discoordinated labor activity
D. risk of uterus rupture
E. II labor period

3. A woman is admitted to maternity home with discontinued labor activity and slight bloody discharges from vagina. The condition is severe, the skin is pale, consciousness is confused. BP is 80/40 mm Hg. Heartbeat of the fetus is not heard. There was a Cesarian section a year ago. Determine the diagnosis?

A. uterus rupture
B. cord presentation
C. placental presentation
D. expulsion of the mucous plug from cervix uteri
E. premature expulsion of amniotic fluid