

**MINISTRY OF PUBLIC HEALTH OF UKRAINE
BUKOVINIAN STATE MEDICAL UNIVERSITY
DEPARTMENT OF OBSTETRICS, GYNECOLOGY AND
PERYNATOLOGY**

**EMERGENCIES IN GYNECOLOGY.
DIAGNOSTICS AND STANDARDS OF EMERGENCY CARE.**
(Educational and methodological manual)

Chernivtsi – 2025

UDC 618.1-083.98-07-08(075.8)
IO 64

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IO 64 Yurieva LN Emergencies in Gynecology. Diagnostics and Standards of Emergency Care.: Educational and methodological manual / LN Yurieva; Eng. Bukovinian State Medical University - Chernivtsi: BSMU, 2025. (1,72 MB)

Educational and methodological manual was designed to improve the acquisition of practical knowledge, skills and abilities to provide emergency care in emergency conditions in gynecology of the medical undergraduates of the 4th and 6th years of study in the specialty Medicine second (master's) educational degree.

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Recommended by the Academic Council at Bukovinian State Medical University as a Educational and methodological manual (protocol №_9_dated 29.05.25).

ISBN 978-617-519-188-0

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PREFACE

An emergency is defined as a serious situation or occurrence that happens unexpectedly and demands immediate action. Although the definition implies that it is unforeseen, preparation and prevention should always be used to reduce the risks of emergencies occurring.

Developing a structured approach to emergencies that can be practised within a 'drill-type' scenario provides students with an ordered sequence of actions that can help in future a stressful and sometimes chaotic situation.

The training material of the manual is based on the principles of evidence-based medicine and contains up-to-date information on Standards of Diagnostic and an Emergency Care in gynecology.

Educational and methodological manual was designed to improve the acquisition of practical knowledge, skills and abilities to provide emergency care in emergency conditions in gynecology of the medical undergraduates of the 4th and 6th years of study in the specialty Medicine second (master's) educational degree.

CONTENT

	PREFACE	PAGE
1	ACUTE ABNORMAL UTERINE BLEEDING	5
2	ECTOPIC PREGNANCY	11
3	OVARIAN APOPLEXY	24
4	TORSION OF THE TUMOR	26
5	DISORDERS OF BLOOD FLOW CIRCULATION IN LEIOMYOMAS NODE	28
6	RUPTURE OF PURULENT TUBO-OVARIAN TUMOR	29
7	TUBO-OVARIAN ABSCESS (TOA)	30
8	PELVIOPERITONITIS	33
9	TRAUMATIC INJURIES OF THE GENITAL ORGANS - PERFORATION OF THE UTERUS	35
10	TEST QUSTION	39
11	Literature	47

ACUTE ABNORMAL UTERINE BLEEDING

AUB affects 10 - 30% of reproductive-aged women Excessive bleeding is recorded in about 8-9% women 15% of all gynecology OPD visits and 25% of all gynecological surgeries.

Characteristics of a normal menstrual cycle

- Duration of bleeding - **4-8 days**
- The interval between bleedings - **is 24-38 days**
- Intensity of blood loss - **5-80 ml**

Menstrual flow outside of normal volume, duration, regularity, or frequency occurs in **the absence of pregnancy** is considered **ABNORMAL UTERINE BLEEDING (AUB)**.

CLASSIFICATION OF AUB

Acute AUB	unrelated to pregnancy was defined in as “that which is sufficient in volume as to, in the opinion of the treating clinician, require urgent or emergent intervention.
Chronic AUB	abnormal uterine bleeding present for most of the previous 6 months. Acute AUB may occur spontaneously or within the context of chronic AUB.
Heavy menstrual bleeding (AUB/HMB)	has been defined as “excessive menstrual blood loss which interferes with the woman’s physical, social, emotional, and/or material quality of life ... [that] can occur alone or in combination with other symptoms”.

Heavy menstrual bleeding (HMB) has a major impact on a woman's quality of life, and ensure that any intervention aims to improve this rather than focusing on blood loss.

ETIOLOGIES OF AUB

**International Federation of Gynecology and Obstetrics (FIGO)
classification system for causes of abnormal uterine bleeding
(PALM&COEIN)**

PALM - “related to uterine structural abnormalities”	Diagnostic of AUB	COEIN - “unrelated to uterine structural abnormalities”
Polyps (AUB-P) Adenomyosis (AUB-A) Leiomyomas (AUB-L) Submucosal (AUB-LSM) Other leiomyoma (AUB-LO) Malignancy and hyperplasia (AUB-M)	Transvaginal ultrasound (TVS) - negative 	Coagulopathy (AUB-C) Ovulatory dysfunction (AUB-O) Endometrial (AUB-E) Iatrogenic (AUB-I) Not yet specified (AUB-N)

INVESTIGATIONS FOR THE CAUSE OF AUB/HMB

1. Collection of passport data (name, **age** of the patient). Clarification of complaints at the time of application.

2. Collect a detailed history with an aim to find out data on somatic, family history and the presence of hereditary diseases (**Co-morbidities**) which increase a woman's risk of **endometrial pathology**:

Co-morbidities which increase a woman's risk of EH should be determined (obesity, diabetes, polycystic ovarian syndrome (PCOS), history of Lynch Syndrome).

3. Laboratory testing for the evaluation of patients with Acute AUB

3.1. Initial laboratory testing:

- CBC with platelets;
- β -Human chorionic gonadotropin (β -hCG) subunit (**TO EXCLUDE PREGNANCY**)

3.2. Other laboratory tests to consider:

- Thyroid-stimulating hormone (TSH)
- Serum iron, total iron binding capacity, and ferritin
- Liver function tests.

3.3. Initial laboratory evaluation for disorders of hemostasis (in adolescents and in adults with a positive screen for coagulopathies).

Positive Screen for Coagulopathies

- Any of following Criteria
- History of heavy bleeding since Menarche

One of the Following:

1. PPH
2. Bleeding associated with dental work
3. Surgery-related bleeding

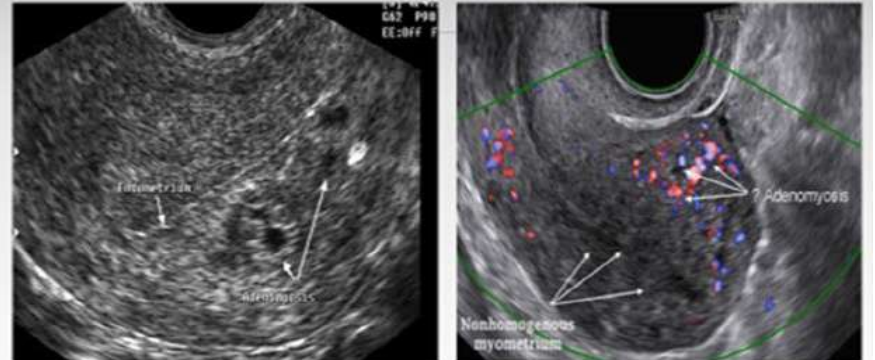
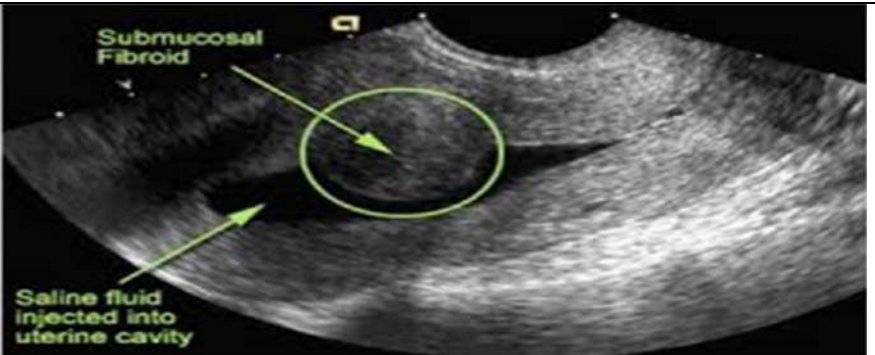
At least TWO of the following

1. At least one episode of Bruising per month

2. At least one episode of Epistaxis per month
3. Frequent gum bleeding
4. Family History of bleeding symptoms

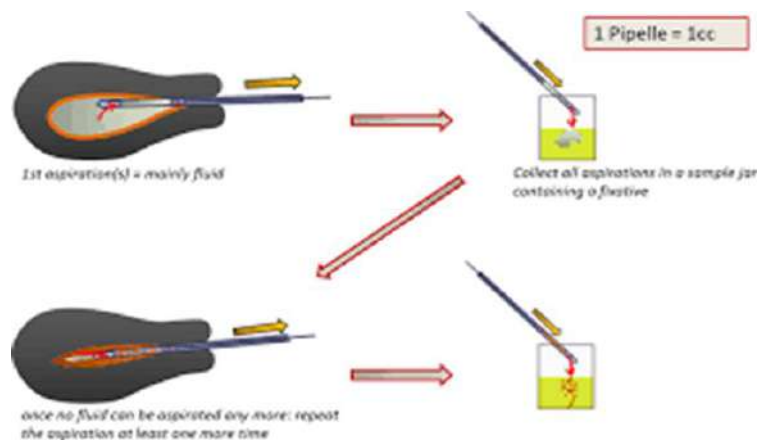
4. Imaging examinations

Transvaginal ultrasound (TVUS) should be done in AUB to evaluate uterus, adnexa and endometrial thickness (polyp, Adenomyosis, Leiomyomas, Endometrial hyperplasia).

Endometrial Polip	
Adenomyosis	
Leiomyomas Submucosal	
Malignancy Hyperplasia	

5. BIOPSY

5.1.1. «**Blind**» aspirations endometrial **BIOPSY** (for clinical problems with AUB as a result of endometrial pathology – polyp, endometrial hyperplasia (EH)).



5.1.2. **Outpatient hysteroscopy** with endometrial **BIOPSY** (for clinical problems with AUB in suspected endometrial cancer).

1. Age > 40
2. Persistent intermenstrual or persistent irregular bleeding
3. Risk factors for endometrial cancer
4. No response to medical management.

Who have high risk factors for carcinoma endometrium?:

Women with

- late menopause,
- endometrial thickness >12 mm,
- use of tamoxifen for HRT or breast cancer,
- Family history of malignancy of ovary/breast/endometrium/colon (Non-polyposis Colorectal Cancer (HNPCC) – **Lynch** syndrome.

Co-morbidities:

- obesity associated with hypertension,
- PCOS,
- diabetes,

TREATMENT OF AUB

Treatment options depends on

- Clinical condition (symptoms such as pressure and pain),
- Overall acuity
- Suspected aetiology (the presence or absence of fibroids (including size, number and location), polyps, endometrial pathology or adenomyosis
- Desire for future fertility and
- Any comorbidities

Pharmacological treatments for HMB

Consider starting pharmacological treatment for HMB without investigating the cause if the woman's history and/or examination suggests a low risk of fibroids, uterine cavity abnormality, histological abnormality or adenomyosis.

TREATMENT OF ACUTE AUB

AGENTS	The dosage regimen
Tranexamic acid Antifibrinolytic drugs	Single dose - 1.5 g orally or intravenously in a single dose of 10 mg / kg (maximum 600 mg). Acceptance regimen - 500 mg every 8 hours, 5 days.
Combined oral contraception (COC)	Single dose - 30-35 mg ethinylestradiol Acceptance regimen - one pill every 8 hours (3 times a day) during 7 days, then decrease every 2 days by 1 pill, then to continue with one pill per day for a total of at least 21 days.
Progestin-only regimens	Linestrenol Single dose - 5 mg orally. Acceptance mode - 3 times a day for 7 days.

TREATMENT OF CHRONIC AUB

HORMONAL AGENTS (LNG-IUS, CHC, CVR)	The dosage regimen
First-line Levonorgestrel-releasing intrauterine system (LNG-IUS)	Consider an LNG-IUS as the first treatment for HMB in women with: • no identified pathology or • fibroids less than 3 cm in diameter, which are not causing distortion of the uterine cavity or • suspected or diagnosed adenomyosis
Second-line Combined hormonal contraception (CHC): - COC and - combined vaginal ring (CVR)	Combined hormonal contraception (CHC) Heavy Menstrual Bleeding (HMB) guideline indicates that COC can be used for management of HMB but would generally be second-line after the LNG-releasing intrauterine system (IUS)
Non-steroidal anti-inflammatory drugs (NSAIDs)	
mefenamic acid (MFA)	500 mg three times a day from onset of menses for 4 or 5 days or until menstruation ceased
naproxen	500 mg at onset and three to five hours later, then 500 mg twice a day for five days
ibuprofen	600 mg daily and 1200 mg daily.

SURGICAL TREATMENT

Depends on

- Clinical stability,
- Severity of bleeding,
- Contraindications/ lack of response to medication,
- Desire for future fertility.

Methods of Surgical treatment OF AUB

- 1. Specific surgical treatment for revealed structural pathology (polypectomy, myomectomy).
 2. Endometrial ablation,
 3. Hysterectomy,
 4. Embolization of the uterine arteries.

1. Specific surgical treatment for revealed structural pathology

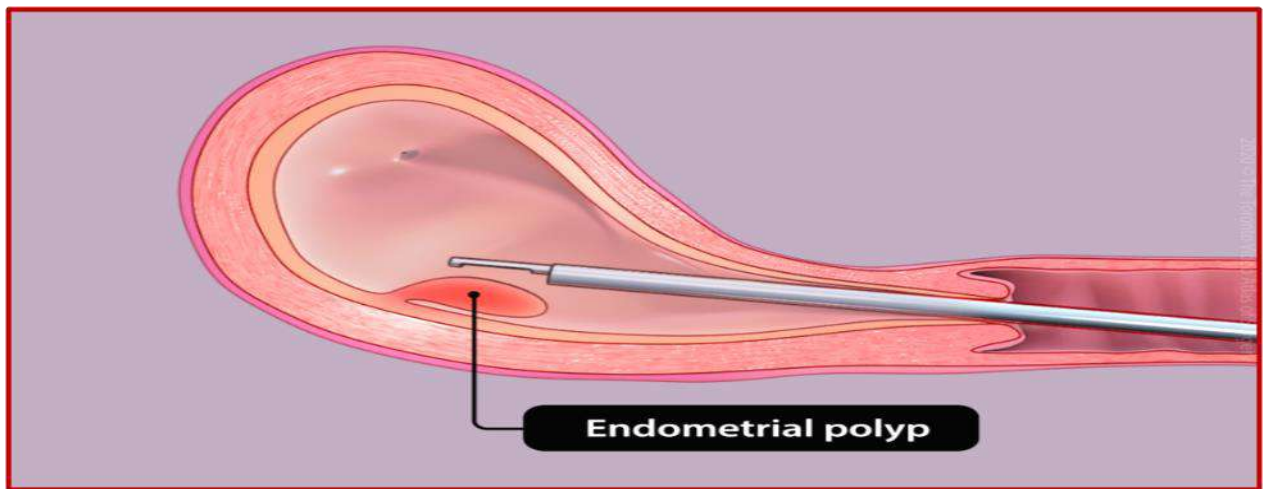


Fig. 1 Hysteroscopy procedure – polypectomy.

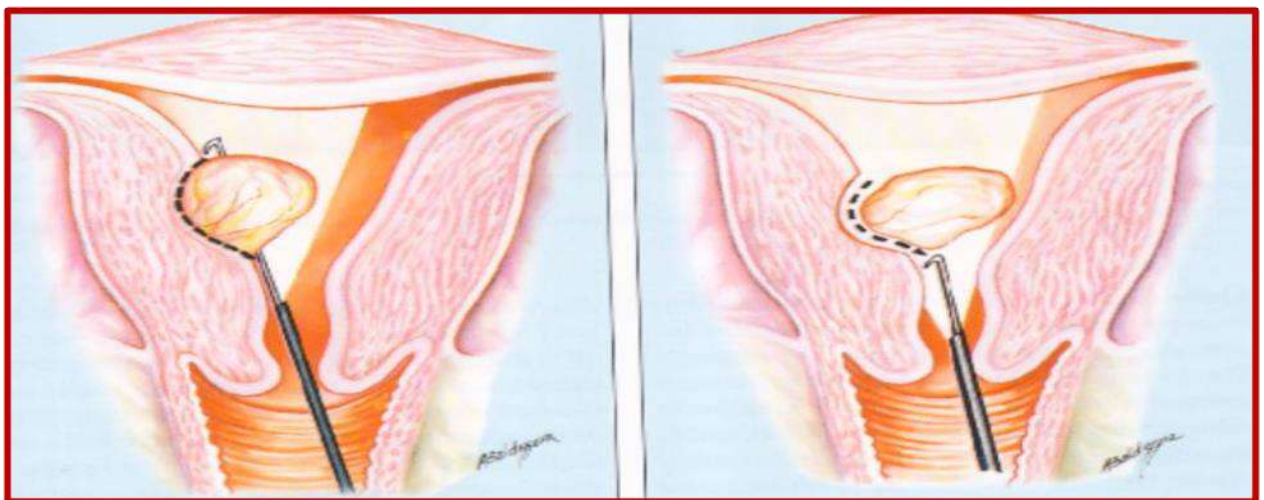


Fig. 2 Hysteroscopy procedure – myomectomy (Submucosal Leiomyomas).

2. Endometrial ablation (EMA)

- Considered appropriate only for patients who have completed their family.
- It is also not suitable for women with a large uterus.

3. Hysterectomy

- Remains the definitive treatment for HMB.
- Should not be used as first-line treatment in cases with primary HMB unless all other treatments are contraindicated or refused by the patient.

4. Uterine embolization

- New and still experimental.

ECTOPIC PREGNANCY

Ectopic pregnancy (EP) is a pregnancy in which a fertilized egg is implanted and develops outside the uterus.

In more than 90% of cases, the egg implants in a fallopian tube. This is called a tubal pregnancy.

Classification.

I. Depending on the place of implantation of the fertilized egg (Fig.1):

1. Tubal pregnancy:

- ampullary
- isthmic

2. **Interstitial EP** - a fertilized egg implants in the portion of fallopian tube closest to the uterus.

3. Cervical EP.

4. A caesarean scar pregnancy (1-3%).

5. **Intramural HP** is when a second gestational sac (GS) is visualised surrounded by myometrium.

6. **Heterotopic pregnancy (HP)** is a rare and life-threatening condition in which an ectopic pregnancy occurs with an intrauterine pregnancy (IUP). (1:4000 up to 1:30 000)

7. EP in the rudimentary horn of the uterus (1:76 000).

8. Ovarian EP (1%).

9. Abdominal EP (1-3%): primary; secondary.

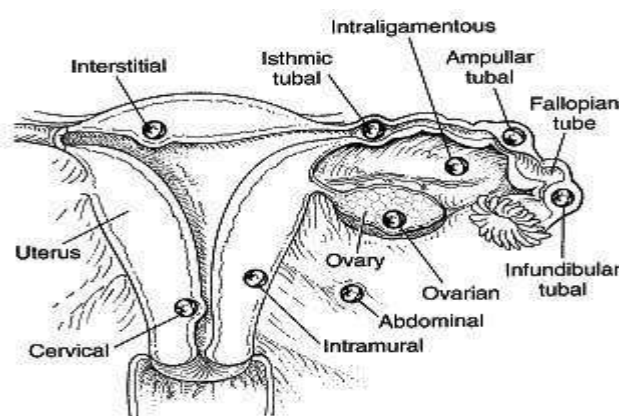


Fig. 3 Ectopic pregnancy location.

II. By frequency of occurrence:

- common forms: ampullary and isthmic localization of tubal pregnancy
- rare forms: interstitial, ovarian, abdominal

III. According to clinical duration:

- progressive
- ruptured (tubal abortion, tubal rupture)

‘Pregnancy of unknown location’ (PUL) is used whenever there is a positive pregnancy test, and no evidence of an intra or extra uterine pregnancy, or retained products of conception on transvaginal ultrasound, despite a positive pregnancy test. This occurs in 8-31% of women attending for an ultrasound assessment in early pregnancy.

Termination of ectopic pregnancy

1. Termination of tubal pregnancy can happen:
 - by tubal rupture type - at 4 - 6 weeks;
 - by tubal abortion type - at 6 - 8 weeks.
2. Termination of cervical pregnancy at 12 -14 weeks.
3. Termination of pregnancy in rudimental corn of the uterus - 16 -18 weeks

Risk factors.

- Pelvic inflammatory disease (PID)
- Smoke cigarettes
- History of curettage
- Older than 35
- Sexually transmitted infection
- Scarring from pelvic surgery
- Prior ectopic pregnancy
- Use fertility drugs
- Intrauterine device (IUD) used for contraception
- Had fertility treatments such as in vitro fertilization (IVF)
- Disorders of hormonal function of the ovaries
- Genital infantilism

- Endometriosis.

CLINICAL SIGNS OF ECTOPIC PREGNANCY

Common symptoms:

- abdominal or pelvic pain (sudden intense pain; unilateral cramping or constant pain in the lower abdomen)
- amenorrhoea or missed period
- vaginal bleeding with or without clots

other reported symptoms:

- breast tenderness
- gastrointestinal symptoms (nausea, vomiting, diarrhoea, or rectal pain on defecation)
- dizziness, fainting or syncope
- shoulder tip pain (a positive bilateral “phrenicus-symptom”)
- urinary symptoms.

Physical signs of ectopic pregnancy include:

- dizziness, loss of consciousness;
- shock or collapse
- pallor
- tachycardia (more than 100 beats per minute) or hypotension (less than 100/60 mm Hg)
- abdominal tenderness
- rebound tenderness or peritoneal signs (a positive Schötkin-Blumberg symptom)

Gynecological examination:

Speculum examination:

- cyanosis of the vagina and cervix;
- vaginal spotting or minor bleeding from the cervix.

On bimanual examination:

- the size of the uterus is slightly enlarged, but it is smaller than the expected gestational age;

- unilateral adnexal enlargement;
- adnexal tenderness;
- cervical motion tenderness;
- overhang of the fornix of the vagina (in the case of hemoperitoneum);
- sharp pain in the posterior fornix of the vagina ("Douglas's cry").

Labarotory signs - urine pregnancy test is positive or β -hCG level in serum is increase.

Clinically progressing EP

- missed period;
- signs of pregnancy_(breast tenderness, nausea, vomiting, etc.);

Gynecological examination:

Speculum examination:

- cyanosis of the vagina and cervix;
- the size of the uterus is slightly enlarged;
- unilateral adnexal enlargment;
- fornixes are free and **painless**.

Labarotory signs - urine pregnancy test is positive or β -hCG level in serum is increase.

Interrupted tubal pregnancy (tubal rupture)

- sudden intense pain in the lower abdomen with syncope;
- vaginal bleeding with or without clots
- signs of intra-abdominal bleeding (pallor, tachycardia and hypotension, shock or collapse)
 - abdominal tenderness
 - peritoneal signs;

Gynecological examination:

Speculum examination:

- cyanosis of the vagina and cervix;
- vaginal spotting or minor bleeding from the cervix.

On bimanual examination:

- the size of the uterus is slightly enlarged, but it is smaller than the expected gestational age;
- adnexal tenderness (unilateral);
- cervical motion tenderness;
- overhang of the fornix of the vagina (in the case of hemoperitoneum);
- sharp pain in the posterior fornix of the vagina ("Douglas's cry").

Labarotory signs - urine pregnancy test is positive or β -hCG level in serum is increase.

Interrupted tubal pregnancy (tubal abortion)

- unilateral cramping or constant pain in the lower abdomen;
- vaginal bleeding with or without clots;

Gynecological examination:

Speculum examination:

- cyanosis of the vagina and cervix;
- vaginal spotting or minor bleeding from the cervix.

On bimanual examination:

- the size of the uterus is slightly enlarged, but it is smaller than the expected gestational age;
- adnexal tenderness (unilateral);
- painfull, inlarged uterine appendages with out clear countur;
- cervical motion tenderness.

Labarotory signs - urine pregnancy test is positive or β -hCG level in serum is increase.

DIAGNOSIS OF EP

1. History. Take a thorough history especially with respect to ectopic pregnancy risk factors and LMP.

2. Past Medical History

The past medical history is an important aspect of gynaecological history taking. In particular, inquire about:

- **Pregnancies** (learn about a full obstetric history [here](#)):

- Number of births/miscarriages/abortions/ectopics.
 - Means of delivery, age of child and birth weight.
 - Explore any obstetric/delivery complications.
 - **Cervical smear** – ascertain the date of the last smear, its result, and any treatment arising.
 - **Surgical history** – particularly any pelvic or abdominal surgery.
 - **Previous gynaecological problems**
 - **Previous sexually transmitted infections**
- 3. Clinical symptoms (common and physical signs of EP, gynecological examination)**
- 4. Pelvic transvaginal ultrasound scan (TVUS):**
- the absence of the ovum in the uterine cavity;
 - visualization of the embryo outside the uterine cavity;
 - detection of the formation of an inhomogeneous structure in the projection of the fallopian tubes;
 - a significant amount of free fluid in the Douglas space (*hemoperitoneum*).

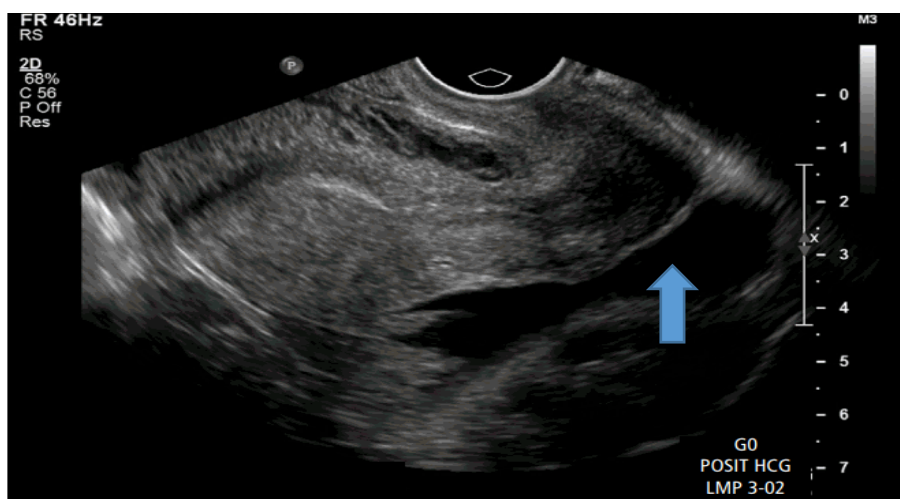


Fig. 4. US of EP: Empty uterus, ( *hemoperitoneum*).

5. Serum β -hCG levels.

To determine the management of EP visualized by transvaginal ultrasound, a single determination of serum β -hCG levels is used.

In hemodynamically stable patients with a baseline serum β -hCG level < 1000 IU/L and PUL - repeated serum β -hCG test **in 48 hours** (but no earlier).

The determination of β -hCG levels in the blood serum for the diagnosis of heterotopic pregnancy is limited.

Before the surgical treatment of EP, it is carried out:

- standard examination for urgent surgical intervention,
- determination of blood loss volume,
- monitoring of blood pressure, pulse, blood saturation according to pulse oximetry,
- of a woman's diuresis.

Magnetic resonance imaging (MRI) in hemodynamically stable patients is a method of diagnosing second-line pregnancy in uterine scarring after cesarean section, interstitial and abdominal EB.

In abdominal pregnancy, MRI can help confirm the diagnosis and determine the c

Surgical management

Indication

- a ruptured ectopic pregnancy;
- failed conservative or medical management of ectopic pregnancy.

Laparoscopy is preferable to laparotomy because of its many advantages:

- reduction of the operation time,
- less intraoperative blood loss,
- reduced hospitalization time,
- lower cost,
- less need for painkillers
- and less likely to form adhesions.

A laparoscopic approach is preferable to an open approach in a patient who is haemodynamically stable.

Laparotomy should be reserved for patients who present with rupture and are in a state of hypovolaemic shock and compromise.

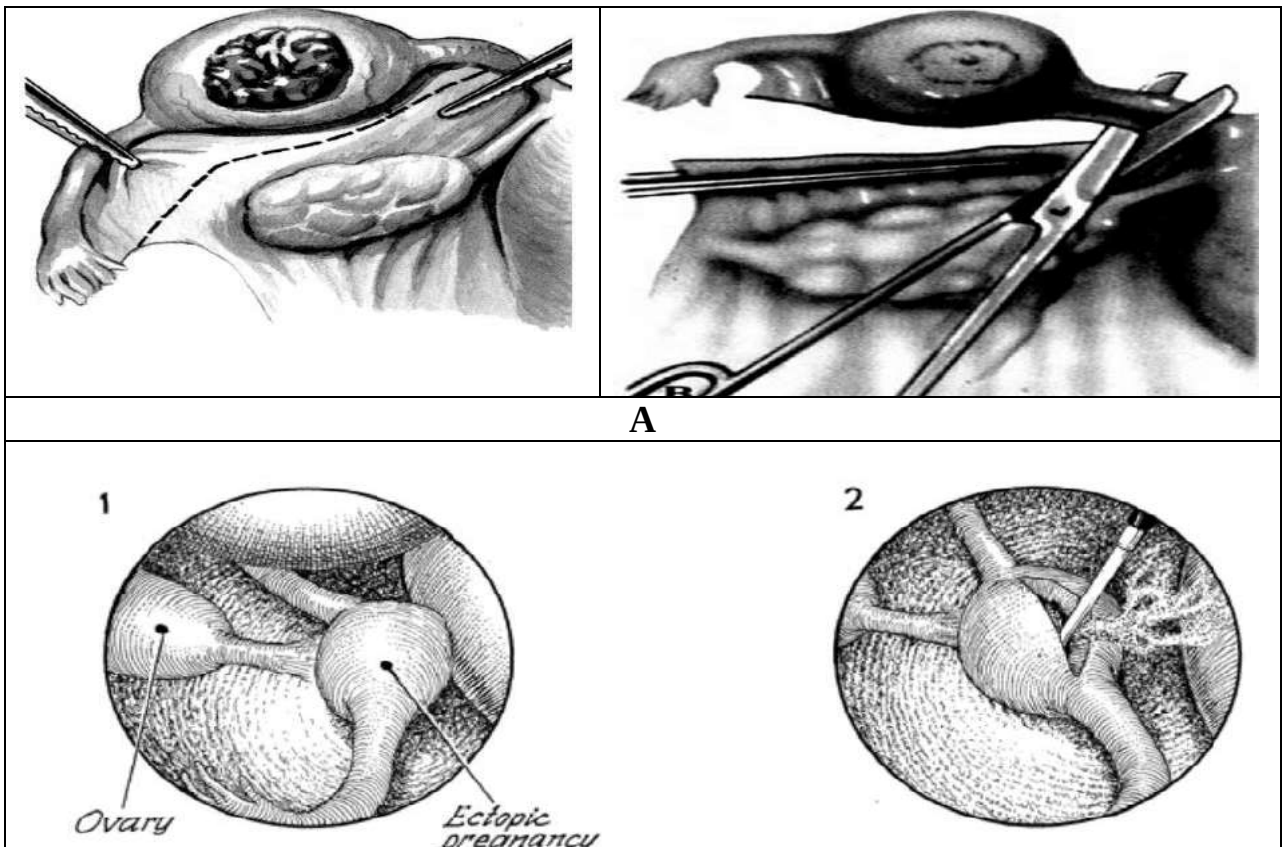
Operations used in case of tubal pregnancy (Fig. 2):

– **salpingectomy (A)** is performed in case of *disrupted tubal pregnancy* in **hemodynamically unstable patients**, especially in the presence of a healthy contralateral fallopian tube/

– **salpingotomy (B) or segmental resection (C)** is recommended in case of *impaired tubal pregnancy* in **hemodynamically stable women** with a history of fertility reduction factors (previous EP, contralateral fallopian tube lesions, abdominal surgery, pelvic inflammatory disease).

Due to the ***risk of trophoblast persistence after salpingotomy***:

- measure the level of β -hCG in the blood serum 7 days after surgery,
- and then every week until a negative result is obtained.



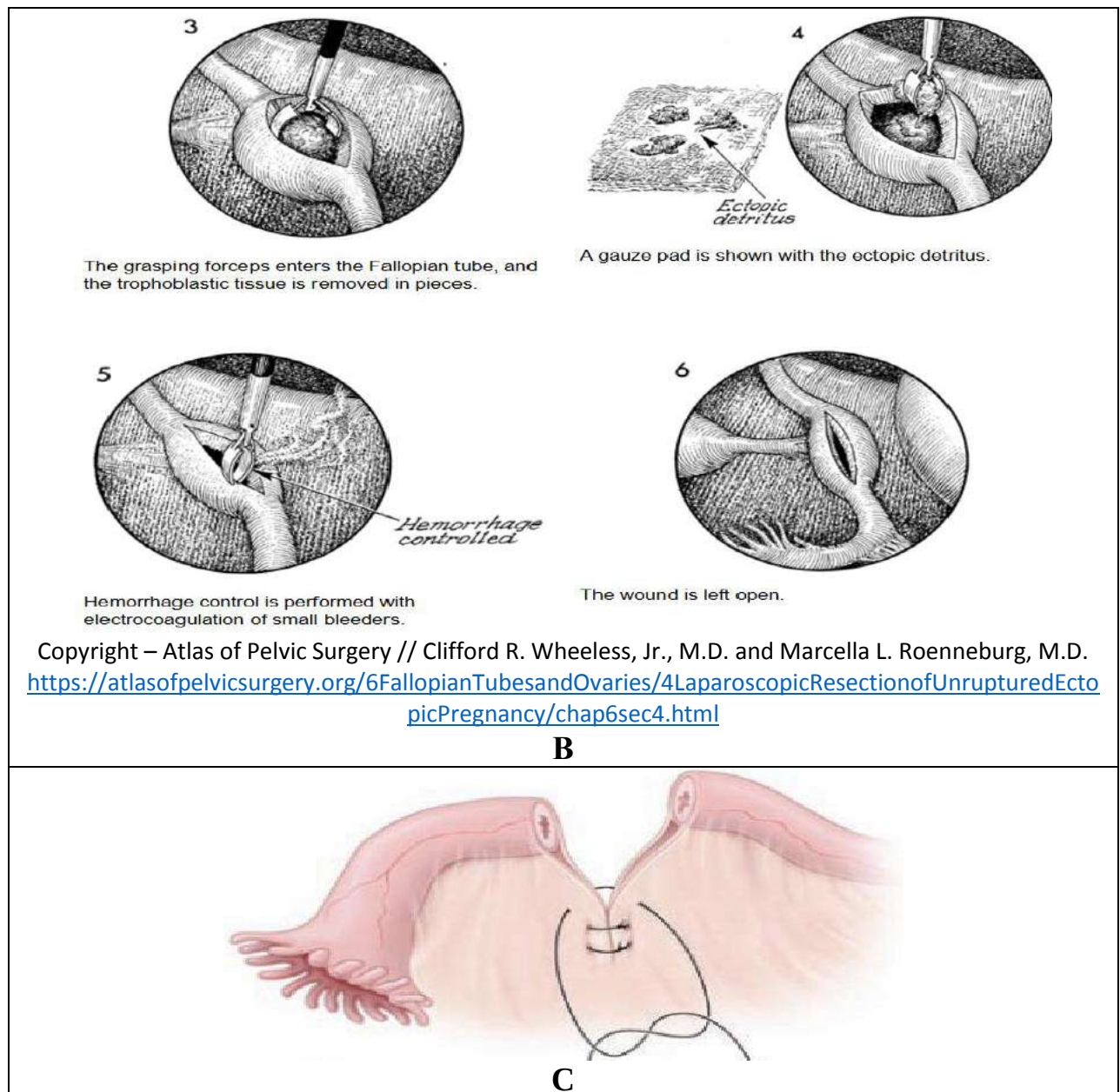


Fig. 5 Surgical management of EP: A – salpingectomy; B – salpingotomy; C – segmental resection.

Expectant management

Medical Management of Ectopic Pregnancy

Medical management of ectopic pregnancy with systemic methotrexate (intramuscular) can successfully treat stable women with ectopic pregnancies and should be considered as an alternative to surgical management where:

- > The serum Beta hCG is < 5000 IU/L.
- > The gestational sac/adnexal mass size is less than 35 mm in maximal diameter.

- > There is no fetal heartbeat demonstrated on TVUS.
- > There is no intrauterine (heterotopic) pregnancy.
- > The woman has access to 24-hour transport and telephone advice and can comply with the treatment plan and follow-up .

The specialist may elect medical management in individual cases outside of the above criteria.

Contraindications to medical management include:

- > Haemodynamic instability or free fluid demonstrated above the level of the uterus/in Morrison's pouch
 - > Presence of an intrauterine pregnancy (in cases of heterotopic pregnancy)
- > Immunodeficiency
- > Sensitivity to methotrexate
- > Pre-existing liver disease, haematological abnormalities, pulmonary disease, peptic ulcer disease or immunodeficiency.
- > No access to 24-hour telephone advice and unable to comply with treatment plan

Laboratory tests to be performed before prescribing methotrexate:

- serum level of β -hCG,
- urea,
- electrolytes,
- liver tests,
- CBC
- blood type, Rh factor.

Medical treatment with methotrexate

- ✓ Methotrexate is a folic acid antagonist that targets rapidly dividing cells and arrests mitosis.
- ✓ In ectopic pregnancy, the drug prevents the proliferation of cytotrophoblast cells, reducing cell viability and β -hCG secretion and thus progesterone support for the pregnancy.
- ✓ This facilitates the resolution of the ectopic pregnancy and tissue remodelling.

Single-dose methotrexate treatment regimen

- ✓ Intramuscular injection at a dose of 50 mg/m² of the calculated body surface area
- ✓ For women with ectopic pregnancy who have had methotrexate, take 2 serum β -hCG measurements in the first week (days 4 and 7) after treatment and then 1 serum β -hCG measurement per week until a negative result is obtained.

Medical care for patients with EP, if there are signs of HEMORRHAGIC SHOCK, is provided in the amount that ensures sufficient infusion of electrolyte solutions and transfusion of blood components to stabilize the condition.

- Insert an IV line (16-18G catheter) and administer **warm** Ringer lactate.
- Closely monitor: heart rate, blood pressure and bleeding.
- Provide oxygen therapy and maintain target blood saturation values.
- Prepare for a possible transfusion, determine the patient's blood type, select potential donors or ensure that blood is available.

The use of tranexamic acid:

- If 1 g of tranexamic acid was administered in the prehospital setting, administer an additional 1g of tranexamic acid.
- If tranexamic acid was not administered in the prehospital setting or is not known, administer 2 g of tranexamic acid in the hospital setting.

* Early diagnosis and initiation of treatment of patients with EB complicated by hemorrhagic shock helps prevent disability and premature death of patients.

Differential diagnosis.

Diagnosis of ectopic pregnancy is quite simple in patients with amenorrhea, signs of pregnancy, lower abdominal pain, and bleeding. However, the following conditions should be excluded:

1. Ovarian cyst torsion
2. Acute appendicitis.
3. Termination of uterine pregnancy.

4. Hemorrhage into the yellow body.
5. Acute or chronic salpingitis.
6. Ovarian cyst rupture.

Preventive measures after an ectopic pregnancy

During the surgical treatment of EP, with current industry standards of medical care is carried out:

- the choice of antibacterial drugs and their regimens;
- prophylaxis of VTE;
- iron deficiency anemia, serum ferritin levels and treatment with iron supplements are tested.

All Rh-negative unsensitized women who have undergone undergoing surgical treatment for EV should be offered anti-D rhesus prophylaxis:

- in pregnancy *up to 12 weeks*, the dose of anti-D(rh) human immunoglobulin is **625 IU (125 mcg)**,
- if the gestation period is *more than 12 weeks* - **1250 IU (250 mcg) or 1500 IU (300 mcg)**.

A dose of anti-D (rh) human immunoglobulin should be administered as soon as possible after surgical treatment of EP **within 72 hours**.

Effective contraception prevents recurrent EP.

Women after EP should be informed about the effectiveness of various contraceptive methods and planning for subsequent pregnancies. After medical treatment of EP, effective contraception is recommended for at least *3 months*.

OVARIAN APOPLEXY

Ovarian apoplexy is a sudden ovarian haemorrhage, accompanied by infringement of the integrity of the ovarian tissue and abdominal bleeding.

Ovarian apoplexy is 0.5–2.5% of cases of all intraabdominal bleedings.

Forms of ovarian apoplexy

- Pain
- Anemic

Clinic of ovarian apoplexy

ANEMIC FORM

- sudden acute pain;
- signs of intra-abdominal bleeding;
- rebound tenderness or peritoneal signs
- pallor
- abdominal distension
- symptoms of peritoneal irritation;
- positive phrenic symptom;
- percussion determination of free fluid in the abdomen
- during gynecological examination - overhang of the posterior fornix, enlargement and pain of the ovary, pain when displacing the cervix.

PAIN FORM:

- cramp-like pain;
- no signs of bleeding into the abdominal cavity;
- mild symptoms of peritoneal irritation.

Diagnosis of ovarian apoplexy

- History
- Objective examination.
- General blood test.
- Urine pregnancy test (to exclude ectopic pregnancy).
- Ultrasound of the pelvic organs.
- Laparoscopy

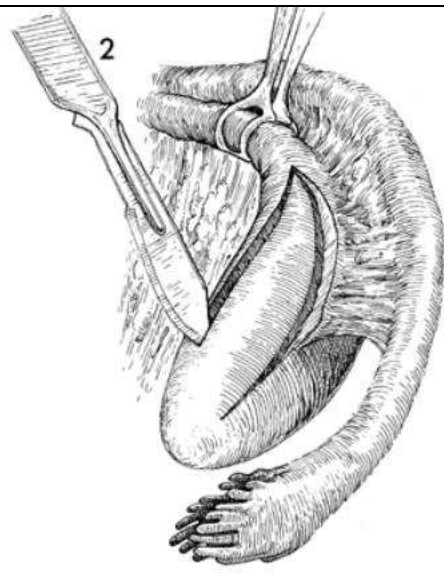
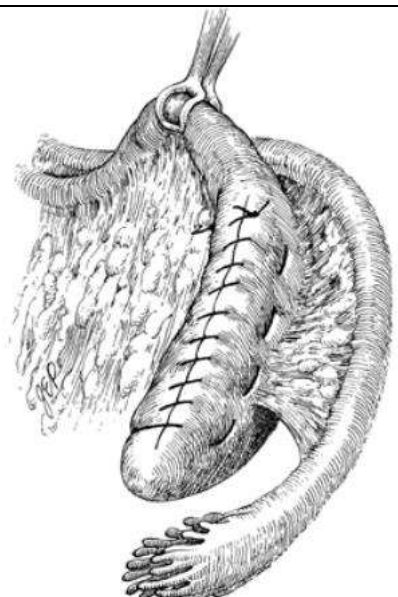
Treatment of apoplexy

PAIN FORM - conservative treatment:

- hemostatics;
- analgetics.

ANEMIC FORM - surgical treatment:

- wedge resection;
- ovarian suturing;
- ovariectomy (rarely).

 A detailed anatomical illustration showing a wedge-shaped portion of an ovary being removed. A surgical instrument, labeled with the number '2', is shown making an incision into the ovarian tissue. The fallopian tube is visible extending from the ovary.	 A detailed anatomical illustration showing an ovary with multiple sutures placed along its length to achieve hemostasis. The fallopian tube is also visible.
Fig. 6 Wedge resection	Fig. 7 Ovaris suturing. Complete hemostasis.
Copyright – Atlas of Pelvic Surgery // Clifford R. Wheelless, Jr., M.D. and Marcella L. Roenneburg, M.D. https://atlasofpelvicsurgery.org/6FallopianTubesandOvaries/4LaparoscopicResectionofUnrupturedEctopicPregnancy/chap6sec4.html	

TORSION OF OVARIAN TUMOR

- **The anatomical leg** of an ovarian tumor is its own ligament and the hanging ligament of the ovary.
- **The surgical leg** is the above structures + fallopian tube, cap, and intestinal loops

Partial torsion of the leg of the ovarian tumor - torsion less than 360 °.

At the same time:

- veins are squeezed,
- there is a venous stagnation,
- the tumor quickly increases in the sizes,
- there can be hemorrhages in its parenchyma.

Complete torsion of the leg of the ovarian tumor - torsion more than 360 °



Fig. 8 Adnexal torsion 360°

<https://www.contemporaryobgyn.net/view/adnexal-torsion-requires-careful-diagnosis-management>

Clinic and diagnosis of ovarian tumor leg torsion

- Intense cramping pain.
- Nausea, vomiting.
- Intestinal paresis.
- Fever.
- Positive symptoms of peritoneal irritation.

- In gynecological examination -
- Ultrasound is a tumor-like formation of various echogenic structure.
- General blood test - leukocytosis with a shift of the formula to the left

Treatment of ovarian tumor torsion

- Surgical treatment – adnexectomy (ovaries that have undergone gangrene should be removed).
- Features of the operation - the tumor is cut below the place of torsion, because thrombi are formed in the leg, which when untwisted the latter can get into the general bloodstream.

DISORDERS OF BLOOD FLOW CIRCULATION IN LEIOMYOMAS NODE

Risk factors:

- torsion of the pedicle of the subserous tumor;
- tumor compression;
- increase in vascular tone;
- increase in uterine tone;
- violation of venous outflow.

Clinic and diagnosis:

- abdominal pain;
- increase temperature;
- the uterus on palpation is enlarged, sensitive;
- at a necrosis a pain syndrome is constant;
- nausea, vomiting;
- positive signs of peritoneal irritation;

Lab: CBC- leukocytosis, shift of the formula to the left;

On ultrasound: the centers of softening in node.

Treatment - operative:

- conservative myomectomy;
- radical (supravaginal amputation of the uterus, extirpation of the uterus).

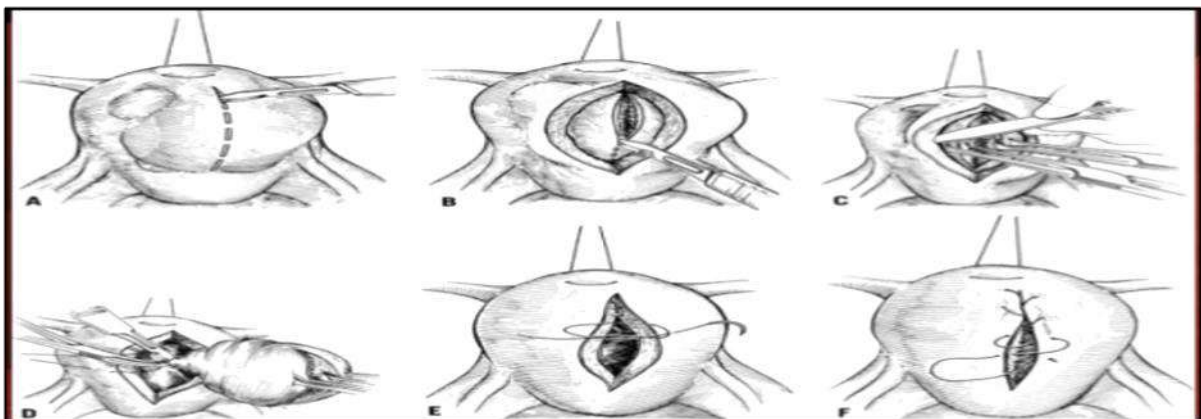


Fig. 9 Conservative myomectomy.

RUPTURE TUBOVARIAL TUMOR

RUPTURE OF THE OVARIAN'S TUMOR CAPSULE

Clinic:

- pain syndrome;
- peritoneal irritation syndrome;
- hyperthermia;
- in the blood test: leukocytosis, shift of the formula to the left, increased ESR;
- intoxication syndrome;
- syndrome of hemodynamic and metabolic disorders;
- early urinary syndrome (with rupture tubovarial tumor).

Diagnosis:

- life history and history of the disease;
- objective and gynecological status;
- laboratory examination;
- ultrasound;
- culdocentesis;
- laparoscopy.

Treatment

Surgical:

- rupture of the ovarian's tumor capsule - - ovarian resection, ovariectomy;
- rupture tuboovarial tumor - adnexectomy.

TUBO-OVARIAN ABSCESS (TOA)

TOA is defined as an inflammatory mass involving the tube and/or ovary characterised by the presence of pus.

TOA is a recognised and serious complication of untreated PID.

Approximately 15% to 35% of patients hospitalized for PID develop TOAs.

Diagnosis of TOA.

1. TOA should be suspected in patients with:

- severe pelvic pain;
- an adnexal mass on abdominal palpation/bimanual examination or seen by imaging (TOA only);
- failure to respond to conservative antibiotic therapy.

Ineffectiveness of conservative treatment of TOA should be suspected if the patient has:

- new or persistent fever,
- worsening pelvic or abdominal pain,
- persistent or increasing leukocytosis
- and/or enlargement of the pelvic mass on repeat ultrasound of the pelvic organs.

IMAGING

1. US - as the first-line imaging to guide diagnosis and treatment.

A TOA can be diagnosed by ultrasound, appearing as a tubo-ovarian complex:

- solid/cystic mass;
- a 'cogwheel' sign resulting from thickened endosalpingeal folds.



Fig. 10 Cogwheel sign resulting from thickened endosalpingeal folds.

Fig. 11 Tubo-ovarian complex.

This complex usually lies in the pouch of Douglas POD compared with ovarian tumours which are often located anterior and superior to the uterus.

2. Computed tomography (CT) imaging is useful when there is a suspicion of gastrointestinal pathology such as an appendix mass.

MANAGEMENT

Initial management of the woman with a suspected TOA is dictated by clinical findings and ultrasound.

CONSERVATIVE TREATMENT OF TOA

- if the woman is systemically well and/or clinically stable,
- abscess diameter < 4 cm;
- in reproductive age.

Ultrasound-guided aspiration or drainage with catheter placement with antibiotic cover should be the first line of treatment of TOAs diameter > 4 cm < 10 cm.

INDICATIONS FOR URGENT SURGICAL TREATMENT ARE:

- large abscess size (≥ 10 cm),
- an acute abdomen with rupture of an abscess is suspected
- systemic sepsis (resuscitation and prompt surgery).

Scope of surgical intervention: salpingoophorectomy.

Postmenopausal patients with TOA are treated surgically, given the high probability of malignancy.

Scope of surgery in postmenopausal patients: total hysterectomy with bilateral salpingoophorectomy (laparoscopically or transabdominally).

Long-term complications

Complications of TOAs arise from tissue damage, scarring, adhesions and fistulae.

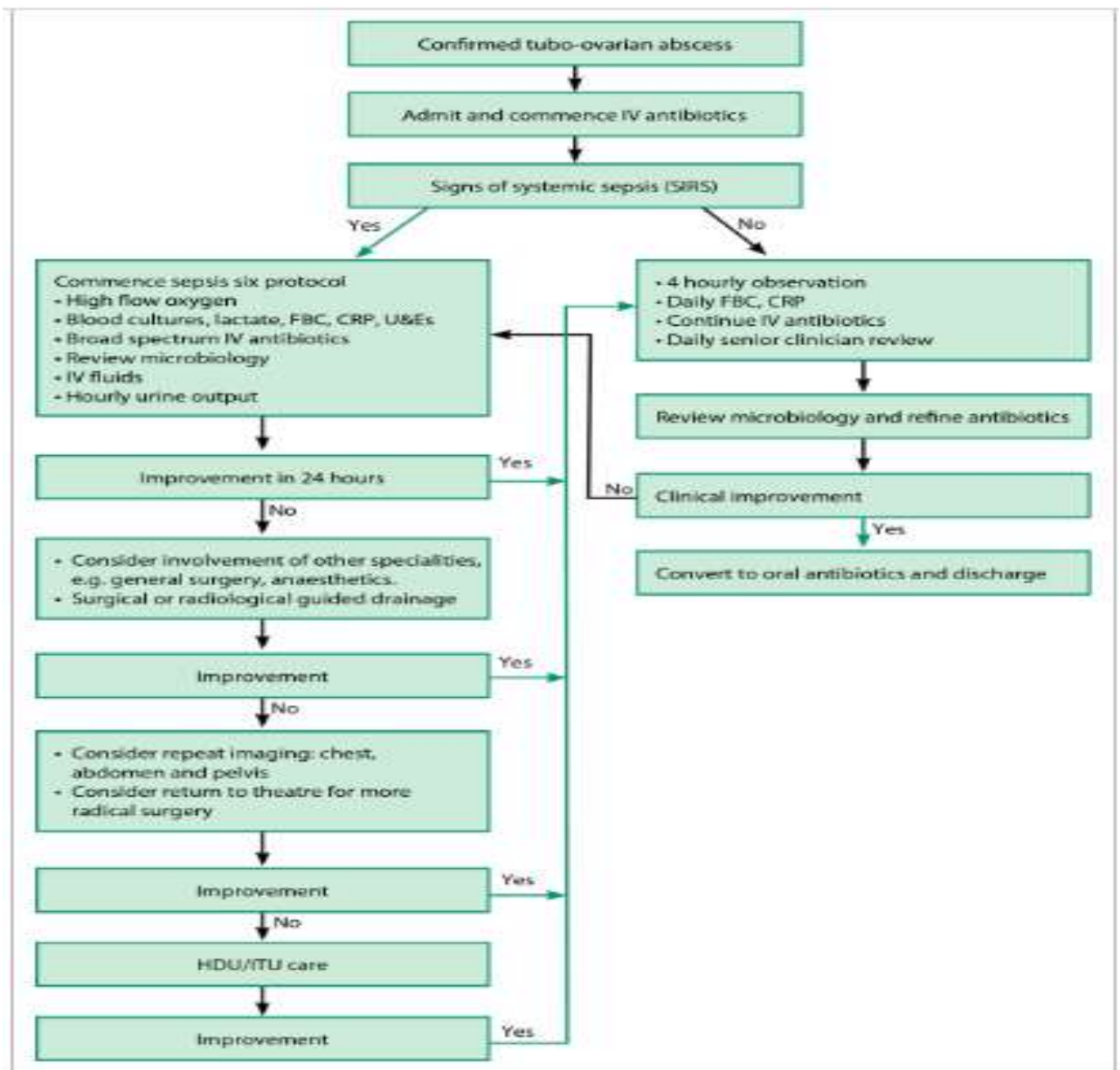


Fig. 12 Suggested approach to the management of a woman with a tubo-ovarian abscess.

CRP = C-reactive protein;

FBC = full blood count;

HDU = high-dependency unit;

ITU = intensive care unit;

IV = intravenous;

SIRS = systemic inflammatory response syndrome;

U&Es = urea and electrolytes.

PELVIOPERITONITIS

Pelvioperitonitis - inflammation of the pelvic peritoneum.

Pelvioperitonitis and peritonitis often arise secondarily as a result of infection spread from the uterus, appendages or pelvic fat to the peritoneum.

The onset of the disease is often provoked by recent uterine instrumentation (IUD, abortion, uterine perforation etc.), posterior vaginal laceration or rupture of purulent masses of uterine appendages with contents pouring out to the abdominal cavity.

By nature, pelvioperitonitis can be:

- serous;
- fibrinous;
- purulent.

The following symptoms are suggestive of a diagnosis of pelvioperitonitis:

- General state disruption. Tongue dry, nausea, vomiting.
- Lower abdominal tenderness and pain – usually bilateral. Positive peritoneal irritating symptoms appear (Schetkin—Blumberg's), intestinal peristalsis weakens.
- Deep dyspareunia – particularly of recent onset

Physical signs

- Cervical motion tenderness on bimanual vaginal examination
- Adnexal tenderness on bimanual vaginal examination – unilateral or bilateral
- Fever ($>38^{\circ}\text{C}$)

Therapy

The choice of an appropriate treatment regimen may be influenced by:

- local antimicrobial sensitivity patterns
- local epidemiology of specific infections in this setting
- cost
- patient preference and compliance
- severity of disease

General measures include:

- rest is advised for those with severe disease;
- if there is a possibility that the patient could be pregnant, a pregnancy test should be performed;
- appropriate analgesia should be provided;

INPATIENT REGIMENS

- i.v./i.m. ceftriaxone 1 g once daily plus
- i.v. doxycycline 100 mg twice daily (oral doxycycline may be used if tolerated) followed by oral doxycycline 100 mg twice daily plus oral metronidazole 500 mg twice daily to complete 14 days.
- i.v. clindamycin 900 mg three times daily plus i.m./i. v. gentamicin (3–6 mg/kg as a single daily dose with renal monitoring) followed by either (oral clindamycin 450 mg four times daily to complete 14 days) or (oral doxycycline 100mg twice daily plus oral metronidazole 500 mg twice daily to complete 14 days).

UTERINE PERFORATION

Among the causes of intraabdominal bleeding a certain place is occupied by perforation of the uterus (**perforatio uteri**) - damage to the uterine wall during diagnostic or surgical manipulations.

The frequency of this pathology is 1%.

SURGICAL INTERVENTIONS DURING WHICH PERFORATION OF THE UTERUS MAY HAPPEN:

- diagnostic scrapings of the uterine mucosa,
- artificial abortion;
- removal of the remains of the fertilized egg in women with spontaneous or criminal miscarriage;
- removal of fibroids.
- intrauterine device (0.04-1.2% of cases).
- hysteroscopy (0.2%)

RISK FACTORS:

- Infection
- Multiparity
- Multiple gestation
- Advanced gestational age
- Inadequate cervical preparation
- Difficult cervical dilation
- Uterine anomalies or cavity distorted by fibroids
- Previous cervical/uterine surgery, including cesarean section
- Provider inexperience
- Presentation for postabortion care (after unsafe abortion procedure)

TYPES OF UTERINE PERFORATION

1. Complete:

- uncomplicated (without damage to the pelvic organs and intestines);

- complicated (with injuries of the intestines, cap, bladder, uterine appendages and other organs).

2. Incomplete - intact serous membrane of the uterus.

CLINICAL MANIFESTATIONS OF UTERINE PERFORATION (during the procedure) (1):

- In most cases, uterine damage occurs when a woman is under anesthesia, so perforation is diagnosed before complaints occur - when perforation is **suspected!**

A provider should suspect uterine perforation when:

- a sudden loss of resistance occurs during cervical dilation or vacuum aspiration, allowing an instrument to pass well beyond the expected length of the uterus.
- A yellow fatty tissue is in the uterine aspirate, their suspicion for uterine perforation and bowel injury should be high and the woman should be referred for immediate surgical management whether stable or not.

Complaints of:

- sharp pain in the lower abdomen (in case of surgery under local anesthesia);
- smearing bloody discharge from the genital tract.

LABORATORY-INSTRUMENTAL RESEARCH

- If complete perforation of the uterus is suspected - diagnostic laparoscopy in an operative theatre.
- If condition of the patient is satisfactory- ultrasound (free liquid in an abdominal cavity, in some cases - degree of damage of a wall of a uterus).
- With obvious bowel damage or herniation through the uterine defect, excessive bleeding, or hemodynamic instability, immediate laparotomy may be preferable
- If the abortion was not completed, the uterus should be evacuated under direct visualization at the time of laparoscopy or laparotomy.

Monitor every 60 minutes

- FBC,

- Coagulation profile.

TACTICS AT THE SENSE OF “FAILURE” OF THE INSTRUMENT

- Stop manipulation.
- If the manipulation was performed with a vacuum curette, turn it off.
- Without removing of the instrument from the uterus, try to palpate it through the anterior abdominal wall.
- Remove the instrument from the uterus.
- If it is a curette, abortion force or a vacuum curette, inspect them carefully.

TACTICS OF CONDUCTING A PATIENT WITH UTERINE PERFORATION DEPENDS ON:

- the size of the perforation hole
- the location of the perforation hole
- the mechanism of perforation
- the probability of damage to the abdominal organs

PERFORATION OF THE UTERUS DURING THE INTRODUCTION OF THE IUD

- It is not always easy to diagnose.
- There is a so-called silent perforation, which does not appear immediately.
- It is even more difficult to diagnose spontaneous or secondary perforation.

SUSPECTION OF UTERINE PERFORATION DURING IMPOSITION OF THE IUD INCREASES IF:

- a woman experiences sharp pain during IUD insertion,
- severe cramping pain does not stop after IUD insertion and lasts for several days;
- no IUD threads in the cervical canal;
- inability to remove the IUD from the cavity uterus in the presence of its threads;
- detection of IUD displacement by X-ray, ultrasound or hysteroscopic examination

PECULIARITIES OF CLINICAL MANIFESTATIONS OF MUTE AND SECONDARY PERFECTION OF THE UTERUS BY INTRACT UTERINE CONTRACEPTIVE

- the woman complains of constant mild pain in the lower abdomen, while she did not notice the expulsion of the spiral;
- severe clinical manifestations of internal bleeding are rare;
- symptoms of peritonitis appear late;
- bimanual examination does not give clear confirmation of uterine perforation

METHODS OF DIAGNOSIS OF PERFORATION DURING THE INTRODUCTION OF THE IUD:

- Ultrasound.
- Hysteroscopy.
- Laparoscopy.

TEST QUESTIONS

1. At what time is cervical pregnancy most often interrupted?

- A. 11-12 weeks
- B. 5-6 weeks
- C. 7-8 weeks
- D. 3-4 weeks
- E. 15-16 weeks

2. Which form of ovarian apoplexy requires surgical treatment?

- A. Anemic
- B. Painful
- C. Mixed
- D. Paraovarian
- E. Intrafollicular

3. Which form of ovarian apoplexy is treated conservatively?

- A. Painful
- B. Anemic
- C. Mixed
- D. Progressive
- E. Disturbed

4. What forms the anatomical leg of an ovarian tumor?

- A. Lig. ovarii proprium, lig. suspensorium ovarii
- B. Broad ligament, round ligament
- C. Pubocervical ligaments, transverse cervical ligaments, uterosacral ligaments
- D. Broad ligament, lig. ovarii proprium, lig. suspensorium ovarii
- E. Lig. ovarii proprium, lig. suspensorium ovarii, uterosacral ligaments

5. What are the ultrasound criteria of tubal EP:

- A. An empty uterus; visualization of a mass or ovum in the area of the uterine appendages, which moves separately from the ovary during ultrasound
- B. Hyperechogenicity of the endometrium
- C. Dilatation of the cervical canal
- D. Hourglass-shaped uterus
- E. A barrel -shaped cervix

6. What are the ultrasound criteria of cervical EP?

- A. All of the listed
- B. An empty uterus
- C. A barrel -shaped cervix
- D. A gestational sac present below the level of the internal os
- E. The absence of the “sliding sign”

7. Risk factors for ectopic pregnancy are:

- A. A history of inflammatory diseases of the uterus and appendages
- B. Ovarian cyst
- C. Use of hormonal contraceptives
- D. Cervical erosion
- E. Smoking

8. At what diameter of the ovum is medical therapy of progressive tubal EP used?:

- A. No more than 35 mm
- B. No more than 40 mm
- C. No more than 50 mm
- D. No more than 55 mm
- E. No more than 60 mm

9. What are the indications for laparotomic treatment of tubal pregnancy?

- A. Hemorrhagic shock
- B. Woman's desire
- C. Progressive pregnancy
- D. Tubal abortion
- E. Woman's desire

10. What are the contraindications for methotrexate therapy in ectopic pregnancy?

- A. All of the listed
- B. Presence of uterine pregnancy
- C. Breastfeeding
- D. Inability to perform further observation
- E. Known sensitivity to methotrexate

11. What are the contraindications for medical treatment in ectopic pregnancy?

- A. All of the listed
- B. Hepatic or renal dysfunction
- C. Blood disease
- D. Active lung disease
- E. Immunodeficiency

12. What medication iare used for conservative treatment for painful type of ovarian apoplexy?

- A. Hemostatics, analgesics, antibiotics
- B. Nonsteroidal anti-inflammatory drugs
- C. Glucocorticoids
- D. Cytostatics
- E. Crystalloids

13. What forms the surgical pedicle of an ovarian tumor?

- A. Lig. ovarii proprium, lig. suspensorium ovarii, fallopian tube, omentum, intestinal loops
- B. Lig. ovarii proprium, lig. suspensorium ovarii, broad ligament, round ligament
- C. Lig. ovarii proprium, lig. suspensorium ovarii, pubocervical ligaments
- D. Lig. ovarii proprium, lig. suspensorium ovarii, transverse cervical ligaments
- E. Lig. ovarii proprium, lig. suspensorium ovarii, uterosacral ligaments

14. What processes are observed with partial torsion of the pedicle of the ovarian tumor?

- A. All of the above
- B. Veins are compressed
- C. Venous stasis occurs
- D. The tumor rapidly increases in size
- E. Hemorrhages may occur in its parenchyma

15. What processes are observed with complete torsion of the pedicle of the ovarian tumor?

- A. All of the above
- B. Arteries are compressed
- C. Necrotic changes occur in the tumor tissue
- D. Peritonitis may develop
- E. Hemorrhagic infarction
- F. Hemorrhage, ischemia

16. In what cases the surgical management of uterine perforation carried out?

- A. All of the above
- B. If a perforation occurs when using a mechanical curette

- C. If a perforation occurs when using a vacuum curette
- D. In case of signs of intra-abdominal bleeding
- E. Small bowel prolapse through uterine perforation

17. Which is the common site of implantation in abdominal EP?

- A. All of the above
- B. Rectouterine pouch (culdesac of Douglas)
- C. Bowel and its mesentery
- D. The peritoneum of the pelvic wall
- E. Omentum

18. Who is most at risk for heterotopic EP?

- A. All of the above.
- B. Previous history of ectopic pregnancy,
- C. Multiple abortions,
- D. Tubal infertility and multiple-embryo transfer
- E. IVF-ET treatment

19. What is heterotopic pregnancy?:

- A. Pregnancy in which both extrauterine (ectopic) pregnancy and intrauterine pregnancy occur simultaneously
- B. Pregnancy in the uterine scar after cesarean section
- C. Pregnancy in the accessory horn of the uterus
- D. Pregnancy between the ligaments of the uterus
- E. Interstitial EP

20. What symptoms indicate a coagulopathic etiology of AUB?

- A. All of the above
- B. Bleeding associated with dental work
- C. Surgery-related bleeding

- D. Frequent gum bleeding
- E. Family history of bleeding symptoms

21. What conditions are indications for hysteroscopy with endometrial biopsy in women with AUB?

- A. All of the above
- B. Family history of malignancy of ovary/breast/endometrium/colon (Lynch syndrome).
- C. Age > 40
- D. Persistent intermenstrual or persistent irregular bleeding
- E. Risk factors for endometrial cancer (obesity associated with hypertension, diabetes, PCOS).

22. Which of the following medications should be prescribed for hemostasis in acute AUB?

- A. Tranexamic acid*
- B. Naproxen
- C. LNG-IUS
- D. Ibuprofen
- E. All of the above

23. What method is appropriate to use for diagnosing uterine perforation by IUD?

- A. Ultrasound
- B. Colonoscopy
- C. Laparoscopy
- D. Colposcopy
- E. Uterine probing

24. What are the conditions for conservative treatment of TOA?

- A. All of the above
- B. Abscess diameter < 4 cm
- C. In reproductive age
- D. No signs of systemic inflammation
- E. If the woman is systemically well and/or clinically stable

25. Which of the following is a contraindication to conservative treatment of TOA?

- A. Abscess diameter ≥ 10 cm
- B. Abscess diameter < 4 cm
- C. In reproductive age
- D. No signs of systemic inflammation
- E. If the woman is systemically well and/or clinically stable

26. At what time does a cervical rudimental corn ectopic pregnancy most often terminate?

- A. 16-18 weeks
- B. 5-6 weeks
- C. 7-8 weeks
- D. 11-12 weeks
- E. 8-9 weeks

27. What dose of tranexamic acid is prescribed to a patient with an ectopic pregnancy and hemodynamic disorders in the prehospital stage?

- A. 1 g
- B. 0,5 g
- C. 2 g
- D. 50 mg/kg
- E. 600 mg

28. What ultrasound characteristic is a sign of cervical pregnancy?:

- A. Hourglass-shaped uterus
- B. Significant amount of free fluid in the Douglas space
- C. Detection of a heterogeneous structure in the area of the projection of the appendages
- D. Narrowing of the cervical canal
- E. Hyperechogenicity of the endometrium

29. What COCs are used for hemostasis in acute AUB?

- A. monophasic with a dose of estradiol 30 mg
- B. monophasic with a dose of estradiol 20 mg
- C. biphasic with a dose of estradiol 30 mg
- D. biphasic with a dose of estradiol 20 mg
- E. monophasic with estradiol valeriot 2 mg

30. Which of the following is a contraindication to conservative treatment of TOA?

- A. Signs of systemic sepsis
- B. Abscess diameter < 4 cm
- C. In reproductive age
- D. Abdominal pain
- E. If the woman is systemically well and/or clinically stable

Correct answers in position A

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