Early Pregnancy Complications

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Early Pregnancy Complications

Spontaneous abortion (SAB)

- First-trimester abortion
- Second-trimester abortion
- Recurrent pregnancy loss

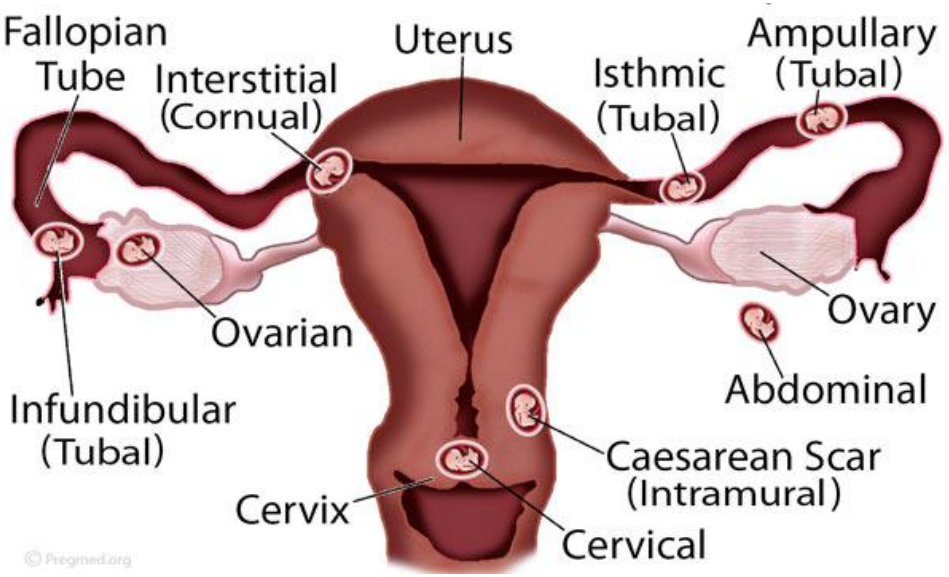
Ectopic pregnancy (EP)

- Tubal/ovarian/peritoneal/cervical EP
- Cesarean scar pregnancy

ECTOPIC PREGNANCY

Contents

Definition



- **ectopic pregnancy**, defined as a pregnancy found outside the uterine cavity.
- a significant cause of maternal morbidity and mortality as well as fetal loss.

Incidence

- During the past 40 years, the incidence of **EP** has been steadily increasing.
- a leading cause of pregnancy-related death in the first trimester, and accounts for 9% of all pregnancy-related deaths.
- Causes: a higher incidence of salpingitis, an increase in ovulation induction, and more tubal sterilization.

Risk factors

- prior EP
- previous tubal surgery
- previous salpingitis or PID
- infertility and ART
- intrauterine device use
- prior induced abortion
- previous abdominal surgery
- smoking

TABLE 10-1. Some Reported Risk Factors for Ectopic Pregnancy

Risk Factor	Relative Risk
Previous ectopic pregnancy	3–13
Tubal corrective surgery	4
Tubal sterilization	9
Intrauterine device	1–4.2
Documented tubal pathology	3.8–21
Infertility	2.5–3
Assisted reproductive technology	2–8
Previous genital infection	2–4
Chlamydia	2
Salpingitis	1.5–6.2
Smoking	1.7–4
Prior abortion	0.6–3
Multiple sexual partners	1.6–3.5
Prior cesarean delivery	1–2.1

Etiology

- Tubal factors:

salpingitis, abnormal tubal anatomy, tubal sterilization & reconstruction

Multiple previous elective pregnancy is a risk fact due to postabortal infection like salpingitis.

16-50% EP rate if pregnancy occurs after tubal ligantion

conservative treatment of an unruptured EP with a recurrent EP rate of 4-16%

- ***Remember:*** *most of these abnormalities are bilateral and irreversible.*

Etiology

- Zygote abnormalities:

Chromosomal abnormalities, gross malformations, and neural tube defects

----Which result in abnormal or ectopic implantation.

- Ovarian factors

Fertilization of an unextruded ovum, transmigration of the ovum into the contralateral tube with subsequent delayed implantation, and postmidcycle ovulation and fertilizaiton.

- Exogenous Hormones

4-6% EP occurs in women taking progestin-only oral contraceptives.

Progesterone's smooth muscle relaxant effects and subsequent "ovum trapping".

Etiology

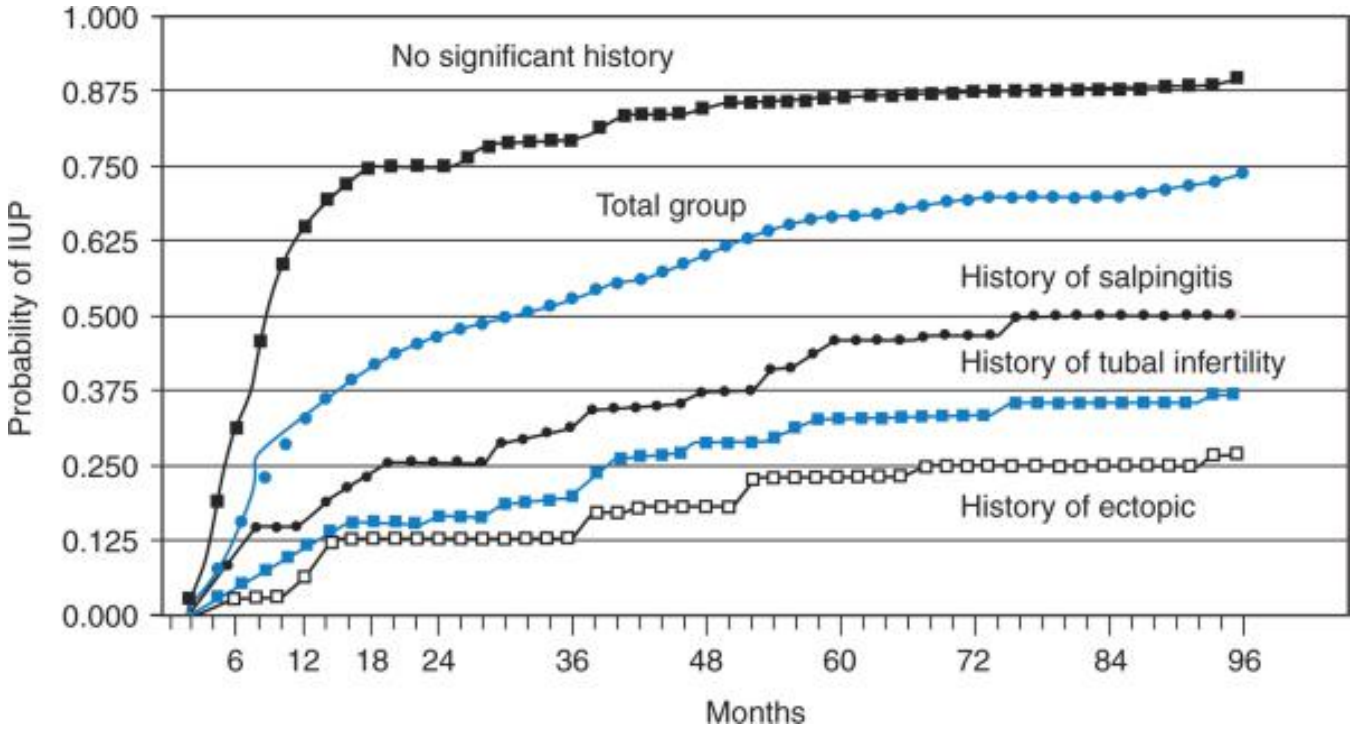
- Other factors

IUD: whether IUD prevents intrauterine but not EP or whether an associated salpingitis is responsible for this increased risk----unclear

Smoking

Aging

Prognosis for subsequent fertility

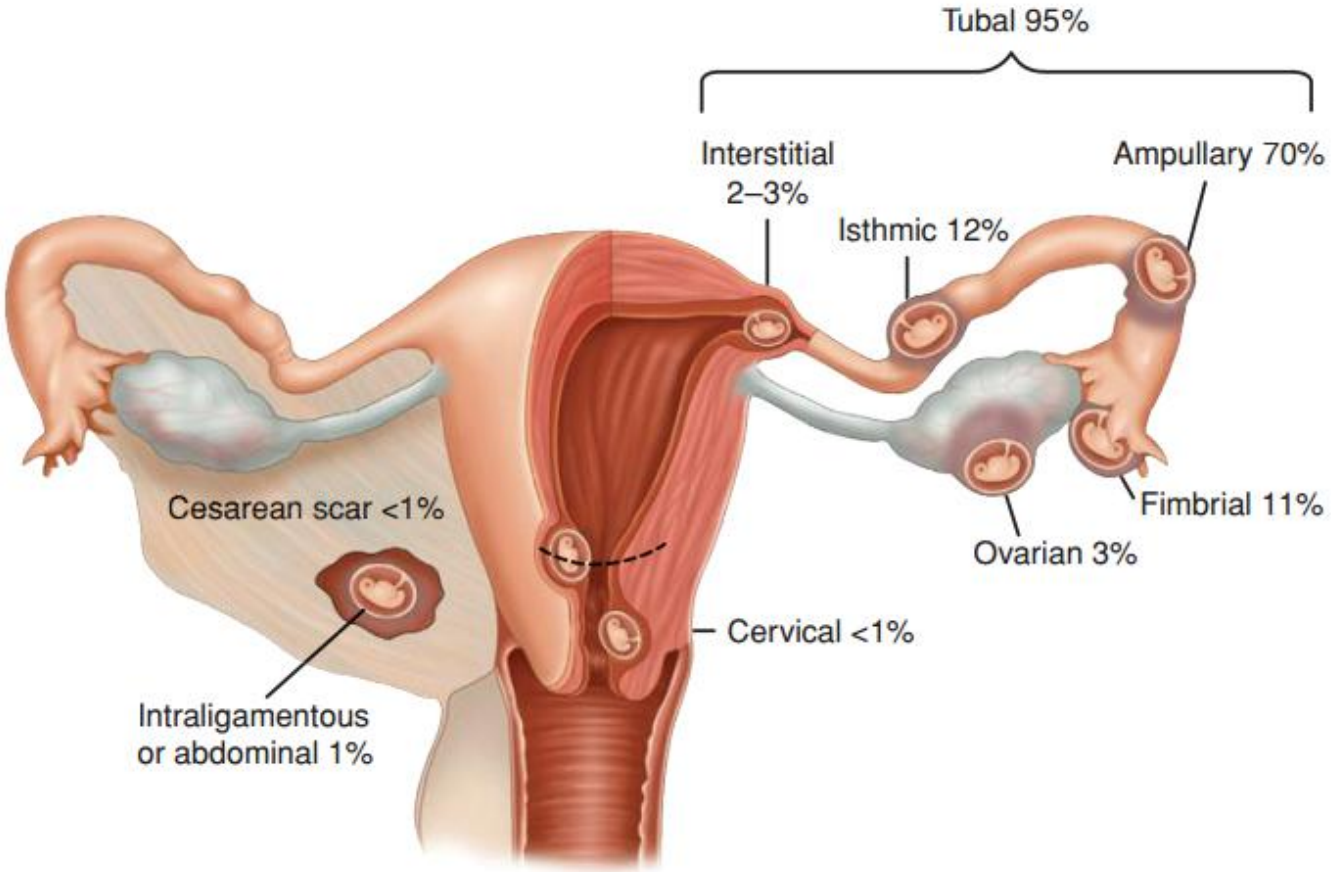


Cumulative pregnancy rate according to the patients' history. IUP, intrauterine pregnancy.

Classification

Location:

- Tubal (> 95%): *anywhere in the fallopian tube*
  - interstitial----2-3%
  - isthmic -------12%
  - ampullary----70%
  - fimbrial-------11%
- Ovarian (3%): *on the ovary*
- Abdominal (1%): *primary & secondary*
- Cervical (<1%): *in the cervix*
- Cesarean (<1%): *in the cesarean scar*


Tubal 95%
Interstitial
2–3%
Isthmic 12%
Ampullary 70%
Cesarean scar <1%
Fimbrial 11%
Ovarian 3%
Cervical <1%
Intraligamentous
or abdominal 1%

Classification

Special situations:

- Heterotopic pregnancy:

  Combined intrauterine and extrauterine pregnancy. It is rare in spontaneous pregnancies, while m*ore frequent（up to 1%） in IVF/ART pregnancies.*

- Bilateral ectopic:

  Rarely reported

- Persistent pregnancy of unknown location (PUL):

  Elevated HCG without ultrasound confirmation

Time of rupture

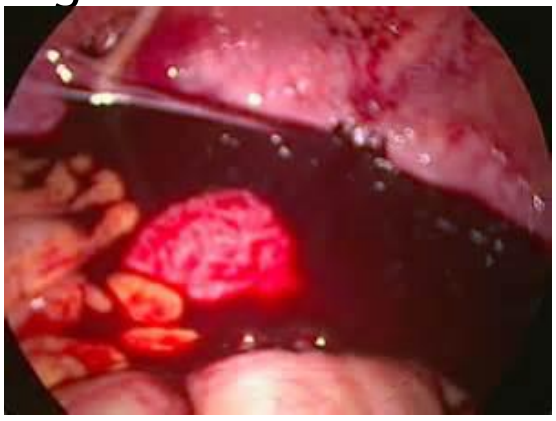
Spontaneous

- Isthmic pregnancy tend to rupture earliest at 6-8 weeks' gestation, due to the small diameter of this portion of the tube.
- Ampullary pregnancy rupture later at 8-12 weeks.
- Interstitial pregnancy is the last to rupture at 12-16 weeks, as the myometrium allows more room to grow than the tube wall. But interstitial rupture is dangerous, as its proximity to uterine and ovarian vessels can result in massive hemorrhage.

Clinical finding-symptoms

The most common symptoms of **EP** are:

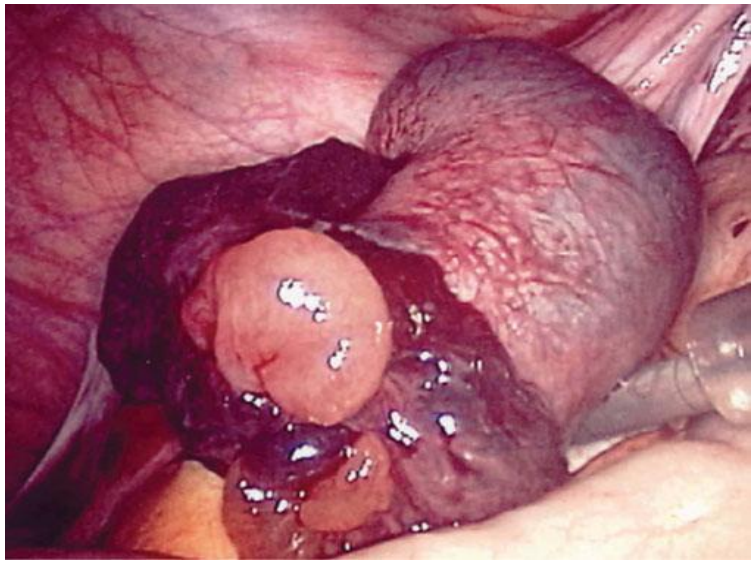
- irregular vaginal bleeding *(75%, 7~14 days after missed menstrual period)*
- Abdominal pain *(variable, could radiate to the shoulder or stomach area)*
- Amenorrhea:absence of menses
- *syncope: significant intra-abdominal hemorrhage*
- *Decidual cast—is passed in 5-10% of EP, and may be mistaken for products of conception.*



Clinical finding-signs

The most common presenting signs in a woman with symptomatic **EP**:

- abdominal tenderness
- adnexal mass
- *cervical motion tenderness*
- *Uterine changes*



Diagnosis

- Lab. Findings:
  - Human chorionic gonadotropin (HCG)
  - Progesterone
  - Hemoglobin or hematocrit
- Special Examinations:
  - Ultrasonography
  - Culdocentesis
  - Laparoscopy

Lab. Finding-HCG

- In normal pregnancies, HCG level doubles every 2+ days in early gestation.
- Two-thirds of EP have abnormal serial titers. HCG level increases at a lower rate.
- Initial and serial tests are both important: HCG increment <66% 2 days apart indicates abnormal pregnancy.

TABLE 10-2. Lower Normal Limits for Percentage Increase of Serum β-hCG During Early Uterine Pregnancy

Sampling Interval (days)	Increase from Initial Value (percent)
1	24–29
2	53–66
3	114
4	175
5	255

Lab. Finding-Progesterone

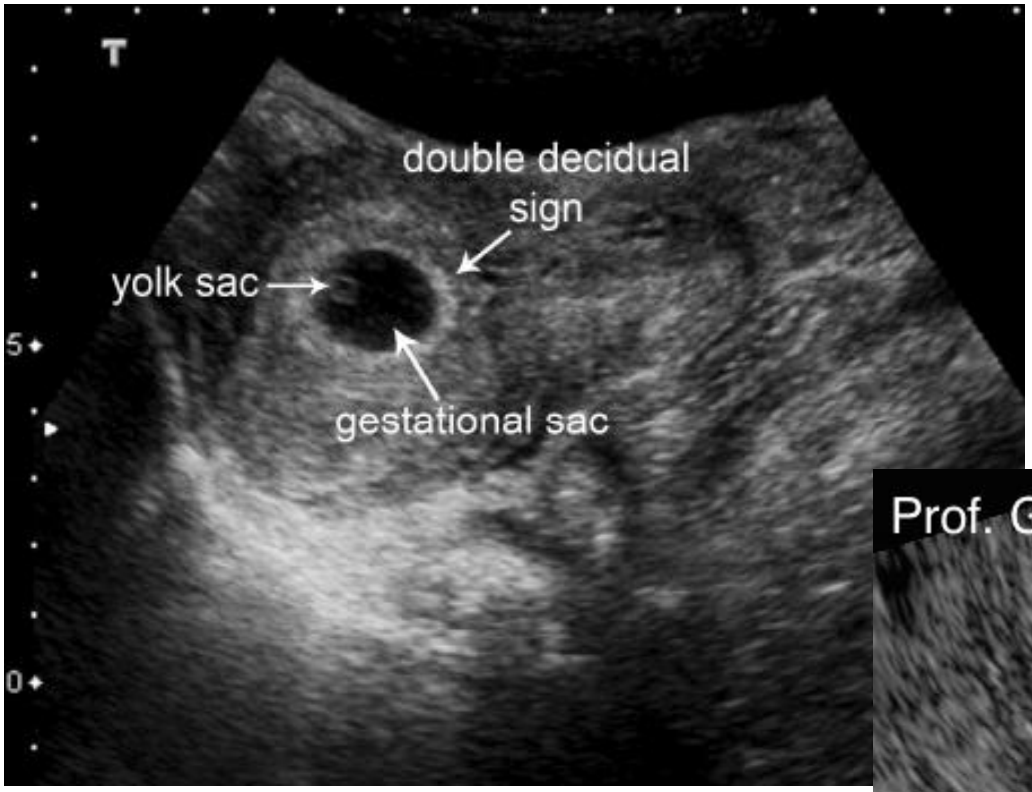
- In EP, the corpus luteum does not secrete as much progesterone as in normal pregnancies.
- A value exceeding 25 ng/mL excludes ectopic pregnancy; while a value below 5 ng/mL preclude normal pregnancy.
- Because in most ectopic pregnancies, progesterone levels range between 10 and 25 ng/mL, the clinical utility is limited.

Special Exam-ultrasonography

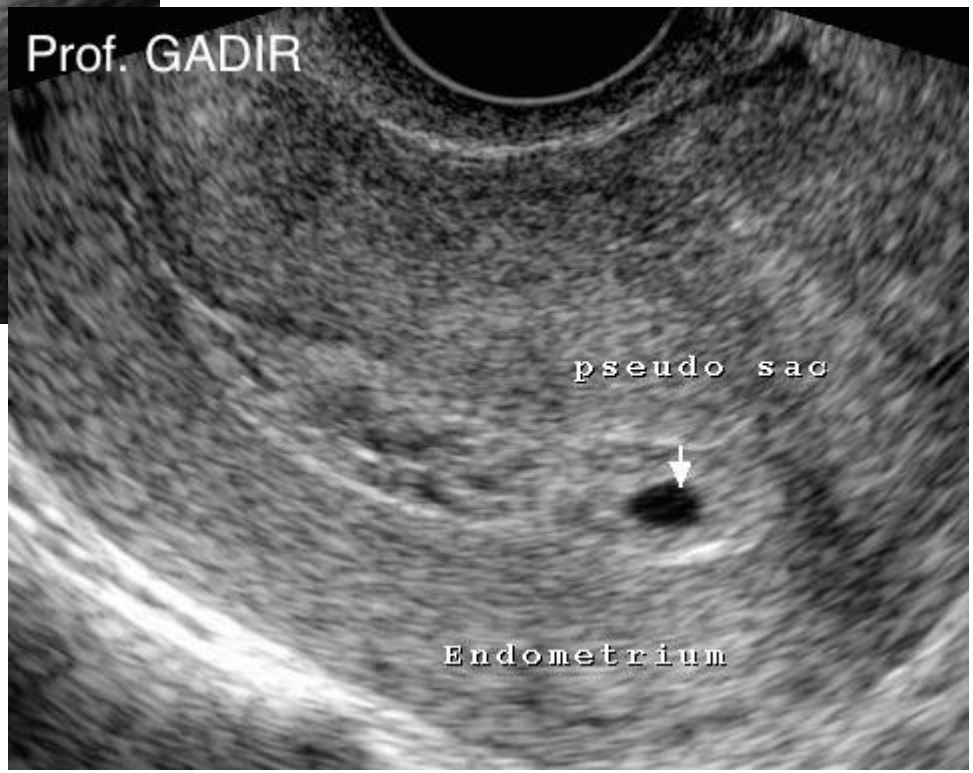
Transvaginal ultrasound (TVS) with color Doppler flow imaging: *the first and foremost step in the evaluation of a suspected EP*

A normal intrauterine sac appears regular and well-defined on ultrasound. It has been described as a “double ring”, which prepresents the decidual lining and the amniotic sac.

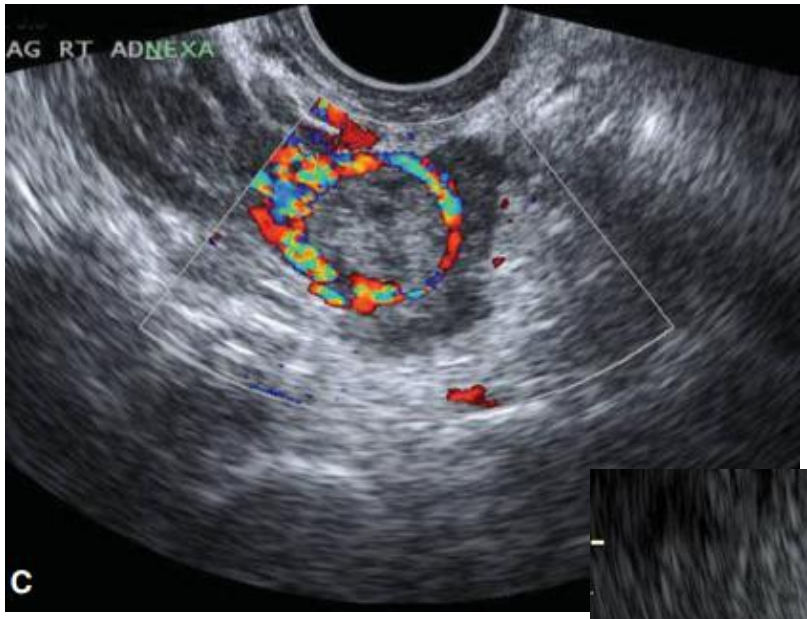
In EP, ultrasound reveal a thickened, decidualized endometrium (an empty uterus) with presence of an adnexal mass.



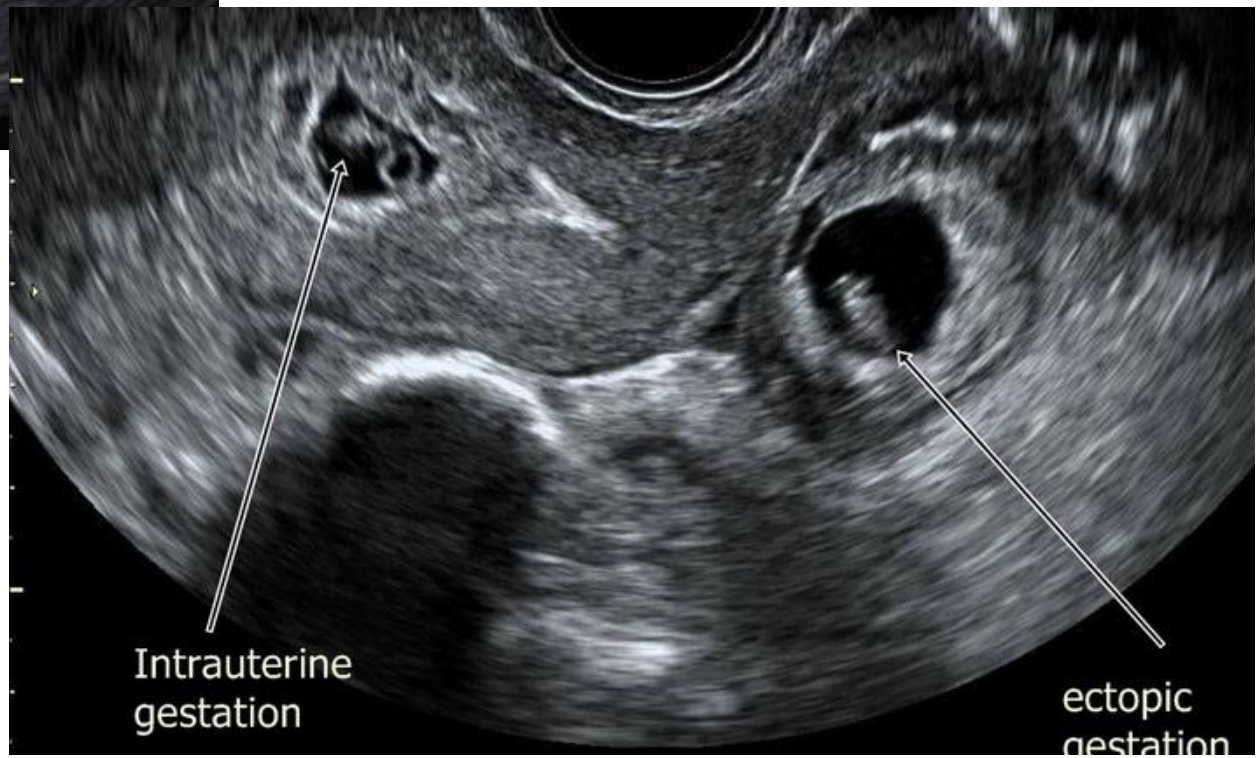
“double ring” sign



Pseudo-gestational sac



“ring of fire” sign



Heterotopic pregnancy

Discriminatory value

- Intrauterine pregnancy should be seen under TVS when β-hCG levels between 1,500 and 2,000 mIU/mL.
- When an empty uterine cavity is seen with β-hCG levels about this threshold, it is likely to be EP.

Other Special Exams

- Laparoscopy: *directly visuslise the tubes, suitable for severe or ambiguous cases that require surgical treatment anyway.*
- Dilation and Curettage (D&C): *exclude intrauterine pregnancy ; if only decidua is obtained on* D&C, EP is highly likely. D&C *should not be performed if the pregnancy is desired.*
- Culdocentesis: *useful in the diagnosis of intra-peritoneal bleeding. If the result is positive, laparoscopy should be performed immediately. ; not commonly performed.*

Special Exam-culdocentesis

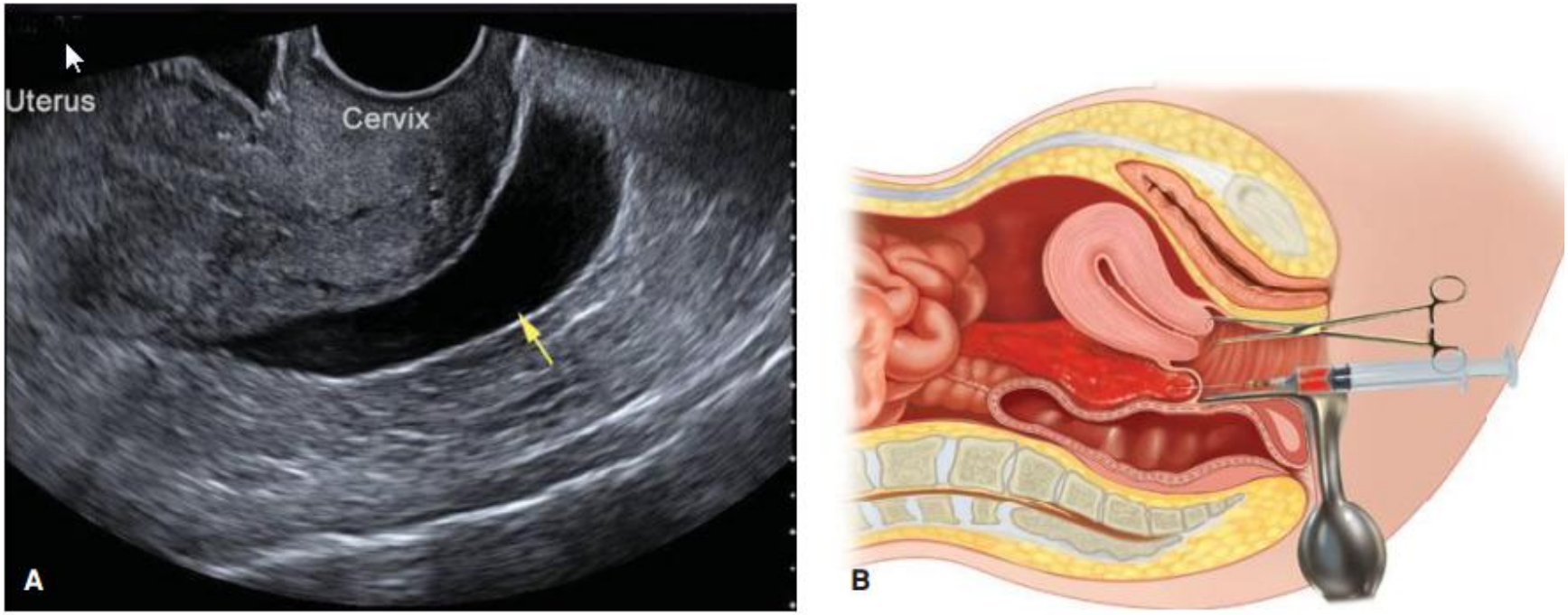
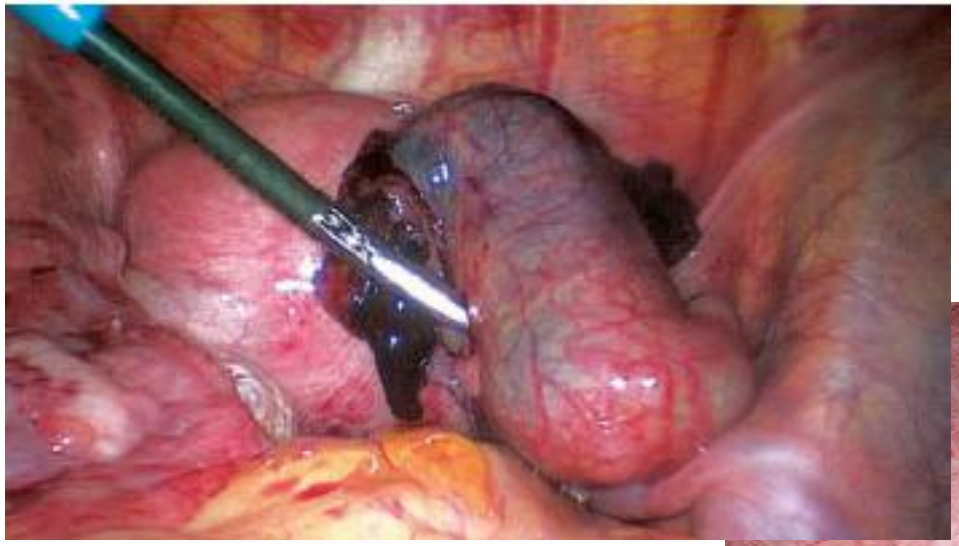
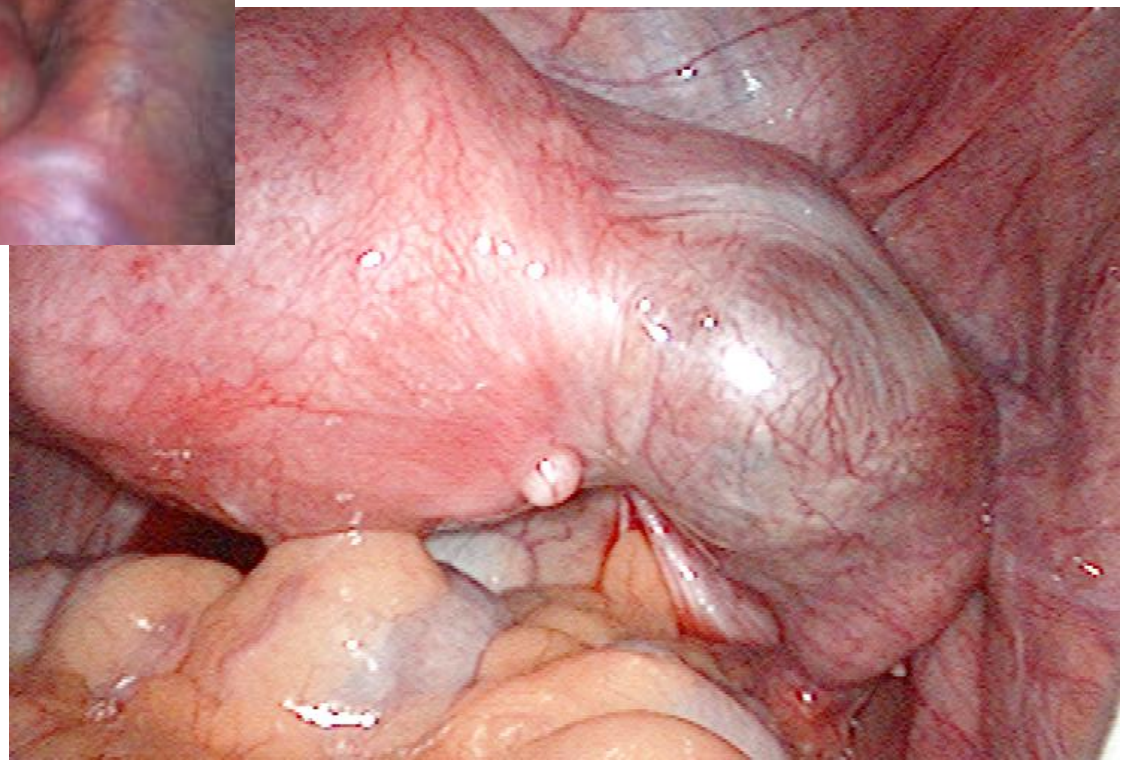
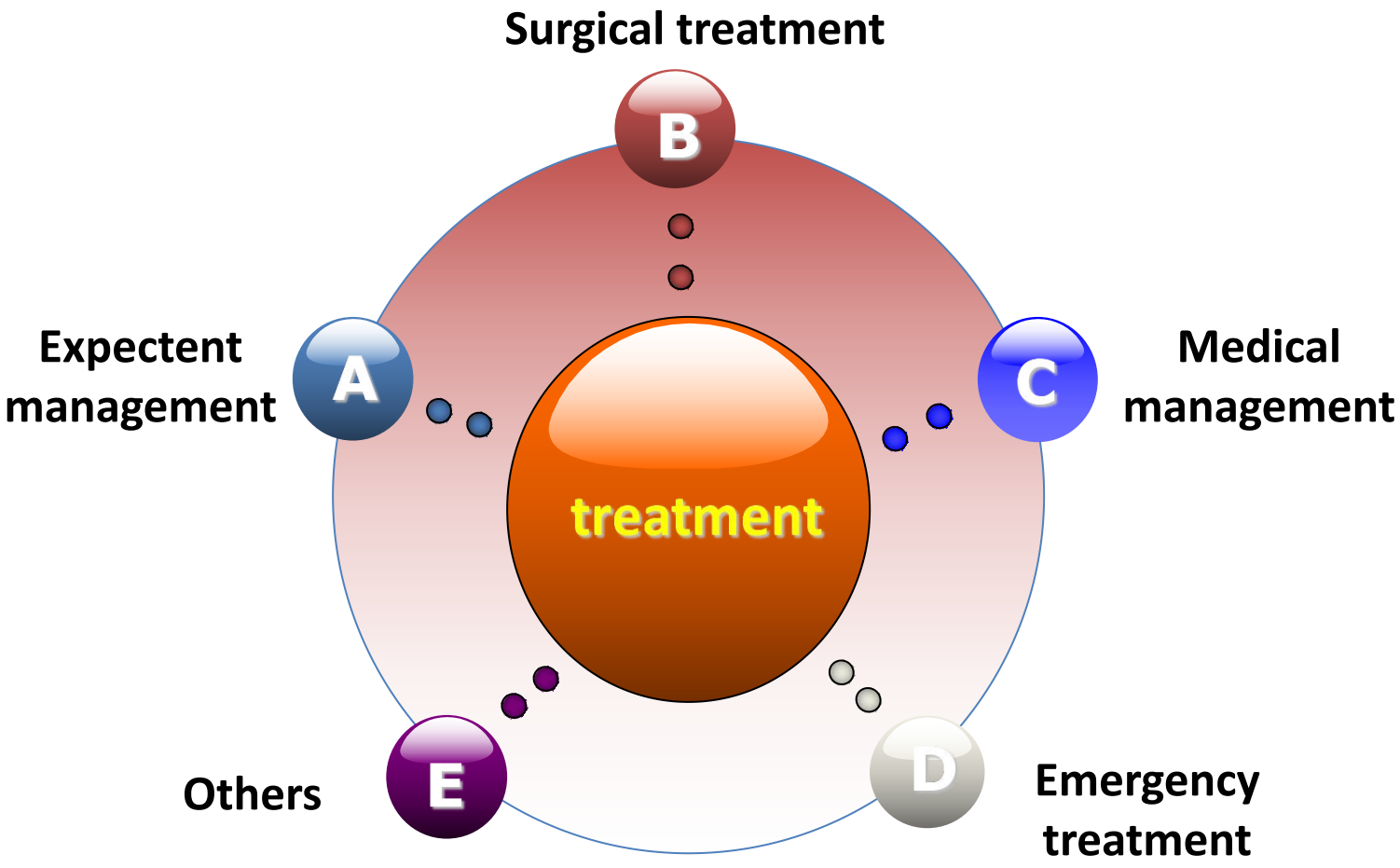


FIGURE 19-7 Techniques to identify hemoperitoneum. **A.** Transvaginal sonography of an anechoic fluid collection (*arrow*) in the retrouterine cul-de-sac. **B.** Culdocentesis: with a 16- to 18-gauge spinal needle attached to a syringe, the cul-de-sac is entered through the posterior vaginal fornix as upward traction is applied to the cervix with a tenaculum.

Special Exam-laparoscopy






Surgical treatment
B
Expectent management
A
C
Medical management
treatment
Others
E
D
Emergency treatment

Expectant Management

- Tubal ectopic pregnancy with decreasing serial β-hCG levels, the ectopic mass diameter ≤ 3.5 cm, and no sonographic evidence of intra-abdominal bleeding or rupture.
- Almost one third of ectopic pregnancies measuring < 3 cm and with β-hCG levels < 1500 mIU/mL resolved without intervention.
- 88% of ectopic pregnancies will resolve if the β-hCG is < 200 mIU/mL.

Treatment-Medical

- Methotrexate (MTX), a chemotherapeutic agent (a folic acid antagonist), is used to treat small unruptured EP.
- Exclusion criteria: a noncompliant patient, peptic ulcer disease, renal disease, blood dyscrasias, hemodynamic instability, free fluid in the cul-de-sac pelvic pain
- Relative contraindications: mass >3.5 cm or an extrauterine gestation with fetal heart motion due to higher failure rate.
- Effects: in select cases, 90% of EP resolve under one month.

- Advantage: *avoid surgery*
- Disadvantage:

☆*mass may take 3 to 4 weeks to resolve*

☆*side effects (20%) : stomatitis, abnormal liver function tests*

☆*treatment failures lead to surgery*

Treatment-Medical

The best candidate for medical therapy is the woman who is asymptomatic, motivated, and compliant. Criteria for MTX treatment include:

- *diameter of the gestational mass less than 4 cm;*
- *serum β-hCG level <5,000 mIU/ml, and without a fetal heartbeat;*
- *no clinical evidence of active bleeding or tubal rupture;*
- persistent hCG elevation after salpingostomy or salpingotomy.

Regimen

- Protocols vary from single to multiple injections, typically given systemically.
- Single-dose intramuscular MTX administration is used most frequently.
- The dose of MTX depends on the patient's body surface area.
- Dosage: 50 mg/m2 BSA (Body Surface Area).
- Toxicity can be blunted by early administration of folic acid in multidose protocol.

Surveillance

- Serum *β-hCG* levels are measured on days 4 and 7 post MTX.
- The *β-hCG* level should decrease by at least 15% 4 -7 days after MTX administration.
- If the *β-hCG* level does not decrease by 15%, worsening pain in conjunction with a hemoperitoneum on ultrasound, and/or hemodynamic instability, a second dose of MTX or surgery may be given.

- Overall success rate is 85%, depending on the initial hCG levels.

Methotrexate Therapy Success Rate at Different Baseline Beta-hCG Levels

Initial beta-hCG level (mIU per mL)	*Success rate (%)*
Less than 1,000 (1,000 IU per L)	98
1,000 to 1,999 (1,000 to 1,999 IU per L)	93
2,000 to 4,999 (2,000 to 4,999 IU per L)	92
5,000 to 9,999 (5,000 to 9,999 IU per L)	87
10,000 to 14,999 (10,000 to 14,999 IU per L)	82
15,000 or greater (15,000 or greater IU per L)	68

Treatment-Surgical

Radical operation: salpingectomy

- Interstitial pregnancy requires a cornual wedge resection, with uterine reconstruction and sometimes salpingectomy on the affected side.

Conservative operation: *does not remove the entire oviduct; for an unruptured EP and who desire future fertility.*

- salpingostomy may be indicated in the hemodynamically stable patient with an ampullary pregnancy who wishes to preserve fertility.
- *With an isthmic EP,* segmental resection with subsequent anastomosis is typically recommended.

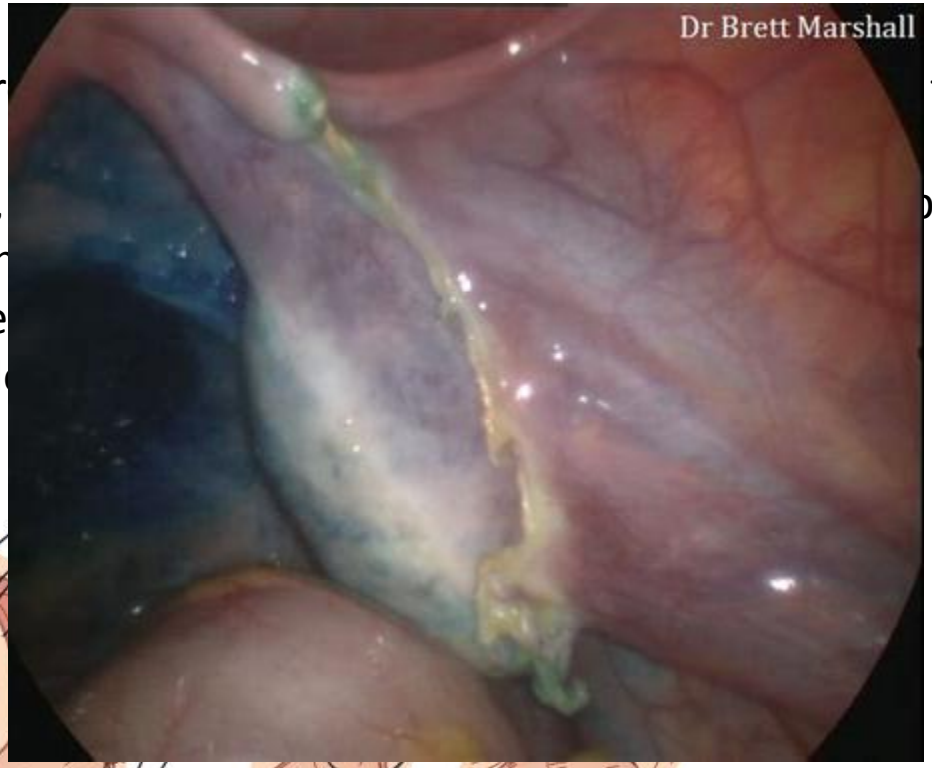
- If the physician is competent in operative laparoscopy, both of these procedures can be performed through the laparoscopy.

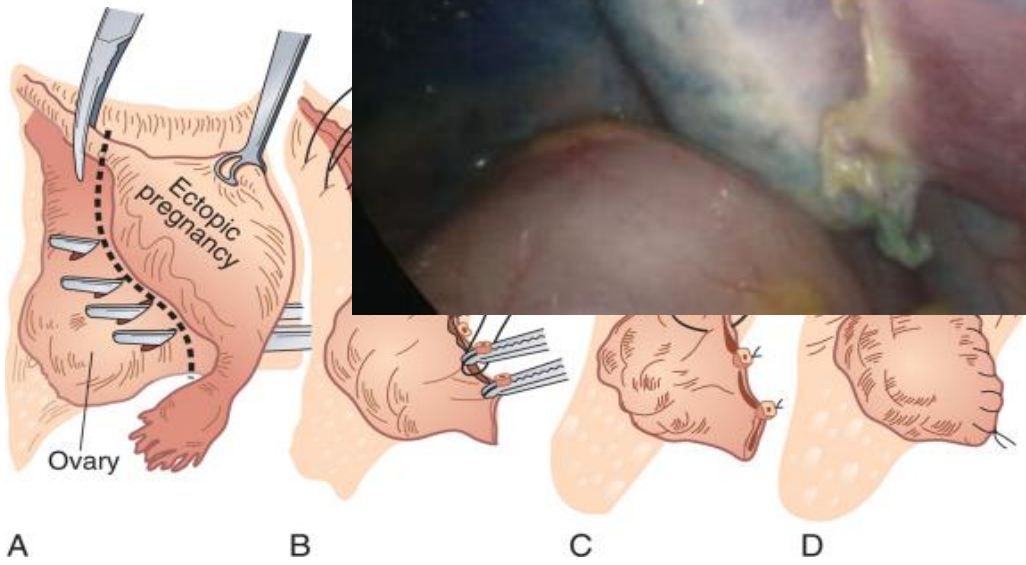
Treatment-Surgical

- Cervical EP, may be associated with massive hemorrhage and may mandate hysterectomy. Attempts at medical management with MTX should be considered.
- Ovarian EP requires oophorectomy and sometimes salpingectomy on the affected side.
- Abdominal EP involves delivery of the fetus (sometimes at term) with ligation of the umbilical cord close to the placenta.

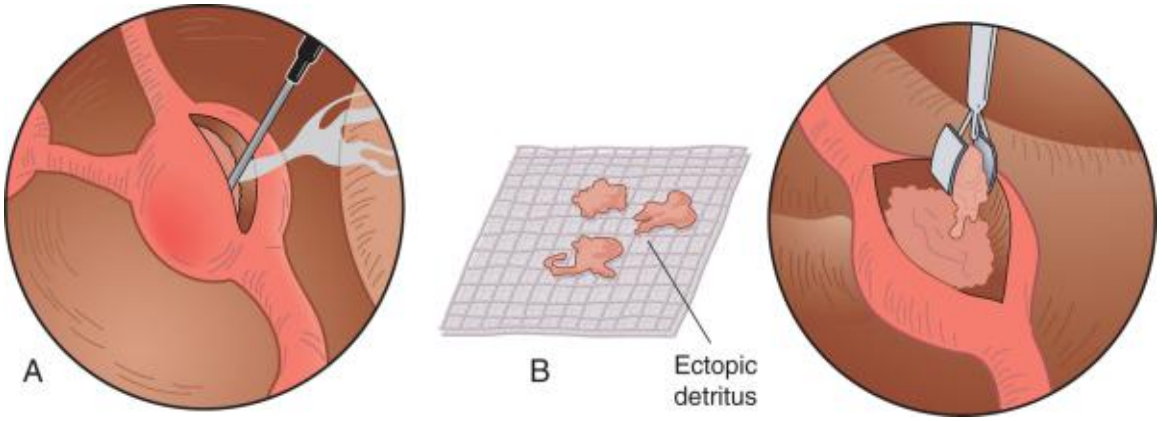
Salpingectomy

A, Tube is excised fr to the fimbria.
B, Pedicles are tied, portion of the tube is buried in
C, Mesosalpinx is re
D, Mesosalpinx is cl





Salpingostomy



A, Fallopian tube is opened in a longitudinal manner.
B, Trophoblastic tissue removed in pieces.

The risk of persistent trophoblast with the need for serum hCG level follow-up; a small risk of further treatment in the form of systemic methotrexate or salpingectomy.

Cesarean scar pregnancy (CSP)

- Embryo implantation within the myometrium of a prior cesarean delivery scar.
- Its incidence approximates 1 in 2000 normal pregnancies and has increased alongside the cesarean delivery rate.
- The pathogenesis of CSP has been likened to that for placenta accreta and carries high risk for serious hemorrhage.
- Women with CSP usually present early, and bleeding is common. However, up to 40% of women are asymptomatic, and the diagnosis is made during routine sonographic examination.
- MR imaging is useful when sonography is equivocal or inconclusive.

Cesarean scar pregnancy (CSP)

- Fertility-preserving options include systemic or locally injected MTX, either alone or combined with conservative surgery, including visually guided suction curettage, hysteroscopic removal, or isthmic excision by laparotomy.
- Often uterine artery embolization is used preoperatively to minimize hemorrhage risk.

Homework-Case study 1

- 25yrs, G1P0,
- complaining of lower pelvic pain;
- spotting for the past week;
- last normal menstrual period: 7 weeks ago;
- serum hCG: 2000IU/L;
- transvaginal ultrasound: no gestational sac, no adnexal masses, no free fluid in cul-de-sac
- The next best step in the management?

Homework-Case study 2

- 23ys, G3P1, ectopic 1
- A sharp, intermittent left lower abdomen pain;
- Missed last period;
- History of a left-side EP a few years ago successfully treated with MTX;
- serum hCG: 10,500IU/L;
- BP=110/74 mmHg, P=90;
- Transvaginal ultrasound: no gestational sac, a 4.3 cm mass in the left adnexa.
- The next best step in management?

Thank You !