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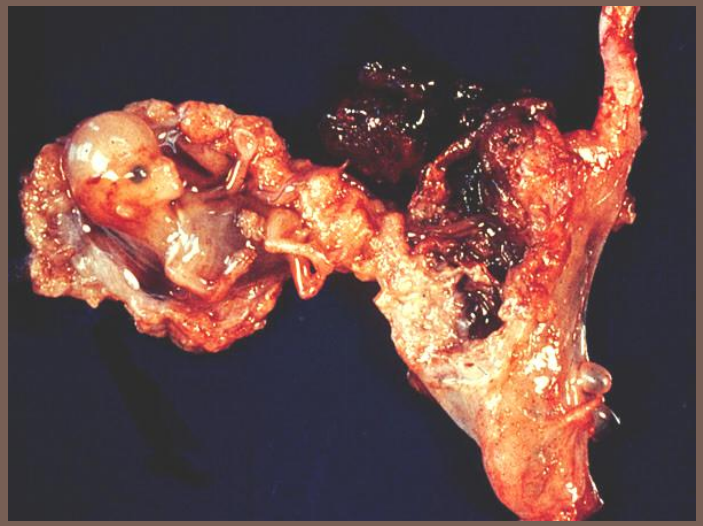


ECTOPIC PREGNANCY

By : Ghasaq Yassen Fadhel

Ectopic Pregnancy

- **Definition:**

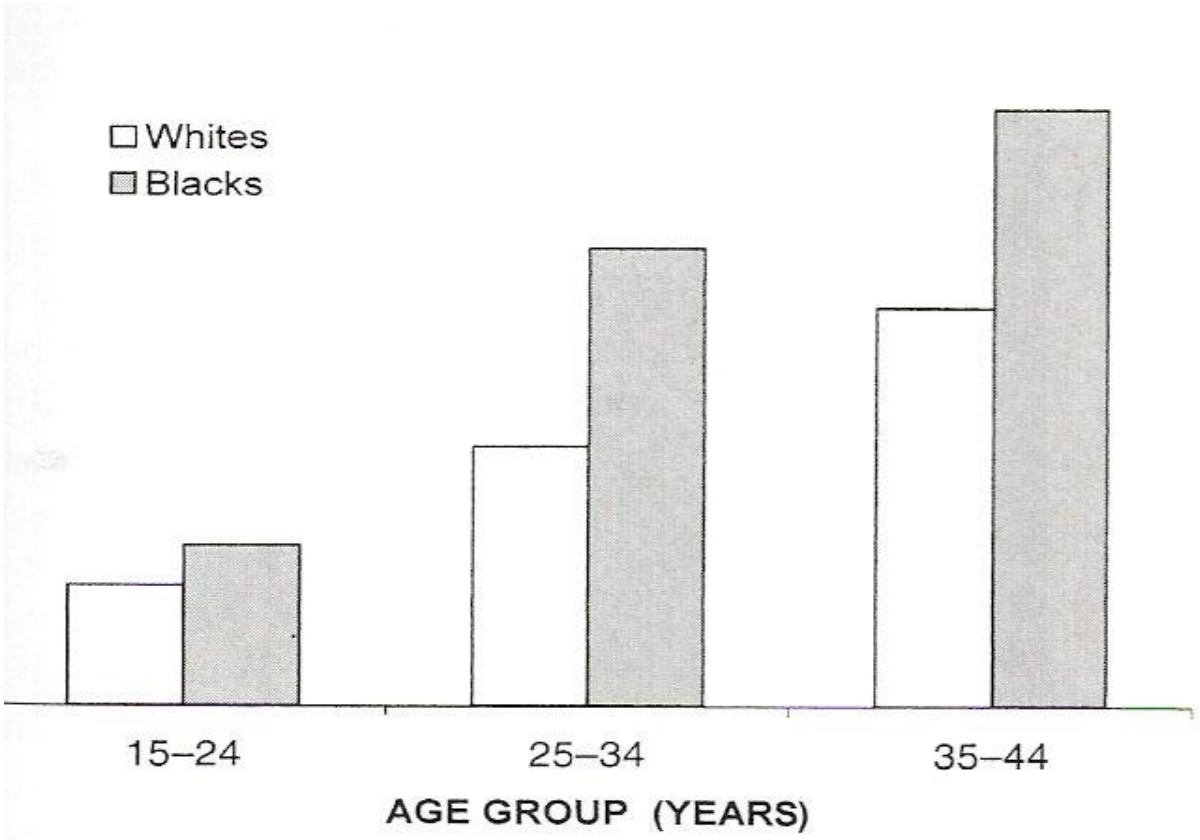
  Implantation of the zygote anywhere else out side uterine cavity

- **Epidemiology:**

- The incidence of ectopic pregnancy rise with time
- From 1970 to 1990 the incidence of ectopic pregnancy in the US tripled.
- They are occurs in 1 every 60 pregnancy

Mortality rate in the mother

Mortality
- markedly decreased due to improved diagnosis & management
- but, most common cause of the maternal death in first trimester of the U.S.A



Site of ectopic pregnancy:

- **Extra uterine :**
  - **Tubal :95%**
  - **Ovarian 1 % [Spiegel berg's Criteria]**
  - **Abdominal 2%**
- **Uterine :**
  - **Rudimentary horn**
  - **Cervical0.15%**
  - **Uterine diverticulum**
  - **Angular 2%**

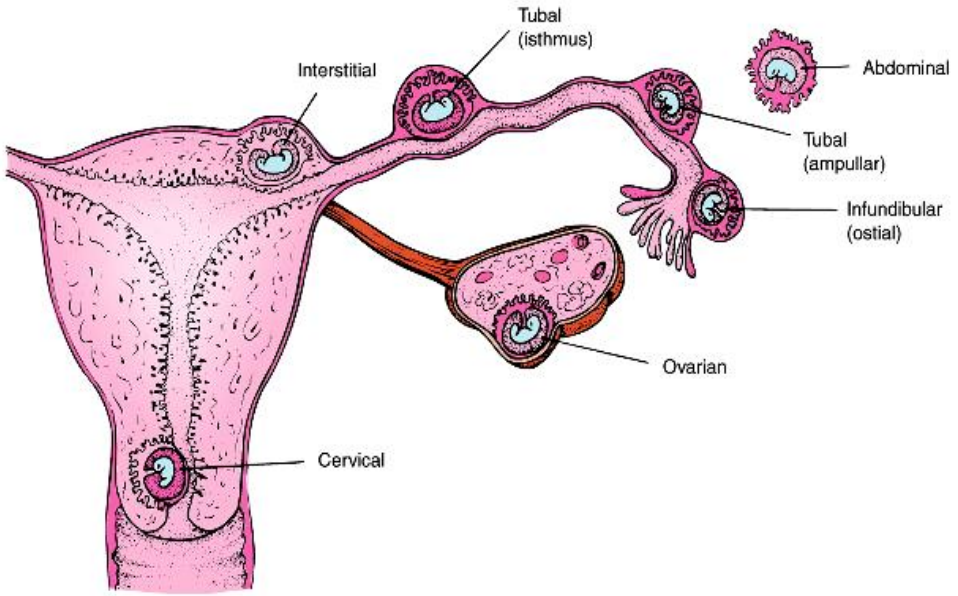


Figure 46-9 Sites of ectopic pregnancy.

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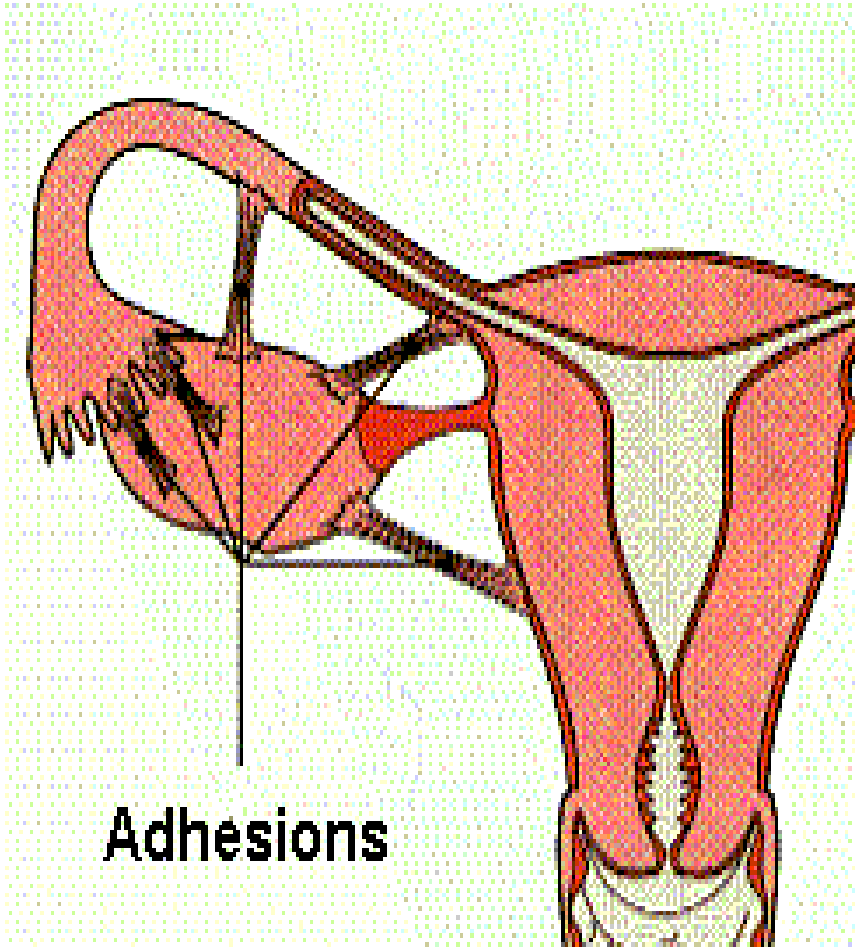
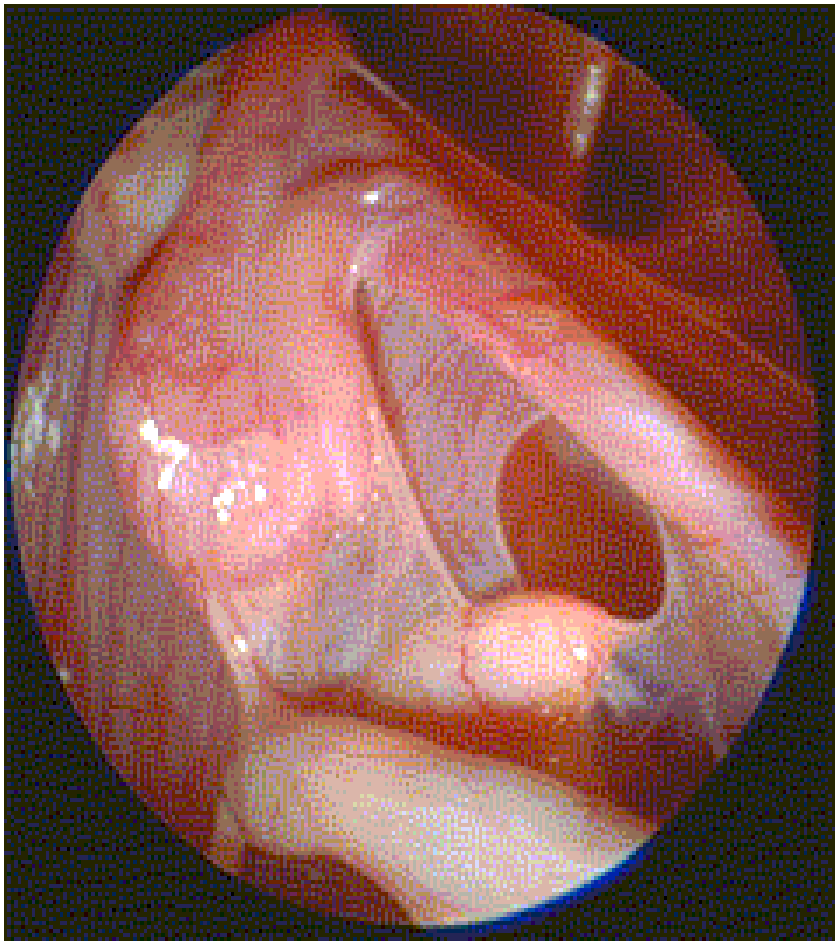
Aetiology

The cause is not always clear but it result from tubal abnormality that obstructs the zygote passage as in

- PID
- Previous tubal surgery
- IUCD
- Congenital abnormality of the tube
- Migration of the ovam across the pelvic cavity to the opposite side

PID with adhesion





Increasing ectopic pregnancy rates:

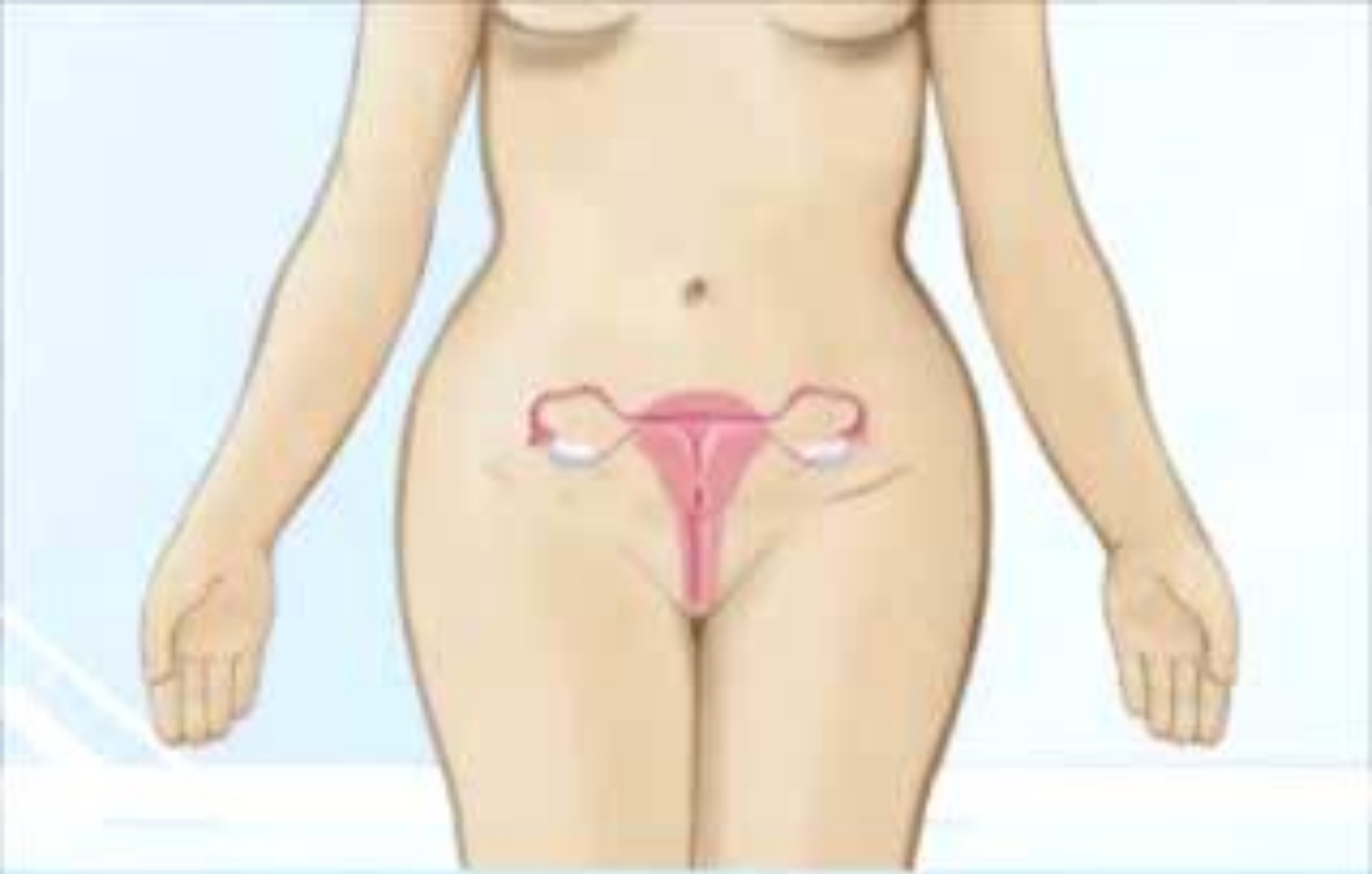
1. Prevalence of sexually transmitted tubal infection and damage
2. Ascertainment through earlier diagnosis of some EP otherwise destined to resorb spontaneously
3. Popularity of contraception that predisposes failures to be ectopic

Increasing ectopic pregnancy rates

4. Use of tubal sterilization techniques that increase the likelihood of EP
5. Use of assisted reproductive techniques
6. Use of tubal surgery, including salpingotomy for tubal pregnancy and tuboplasty for infertility

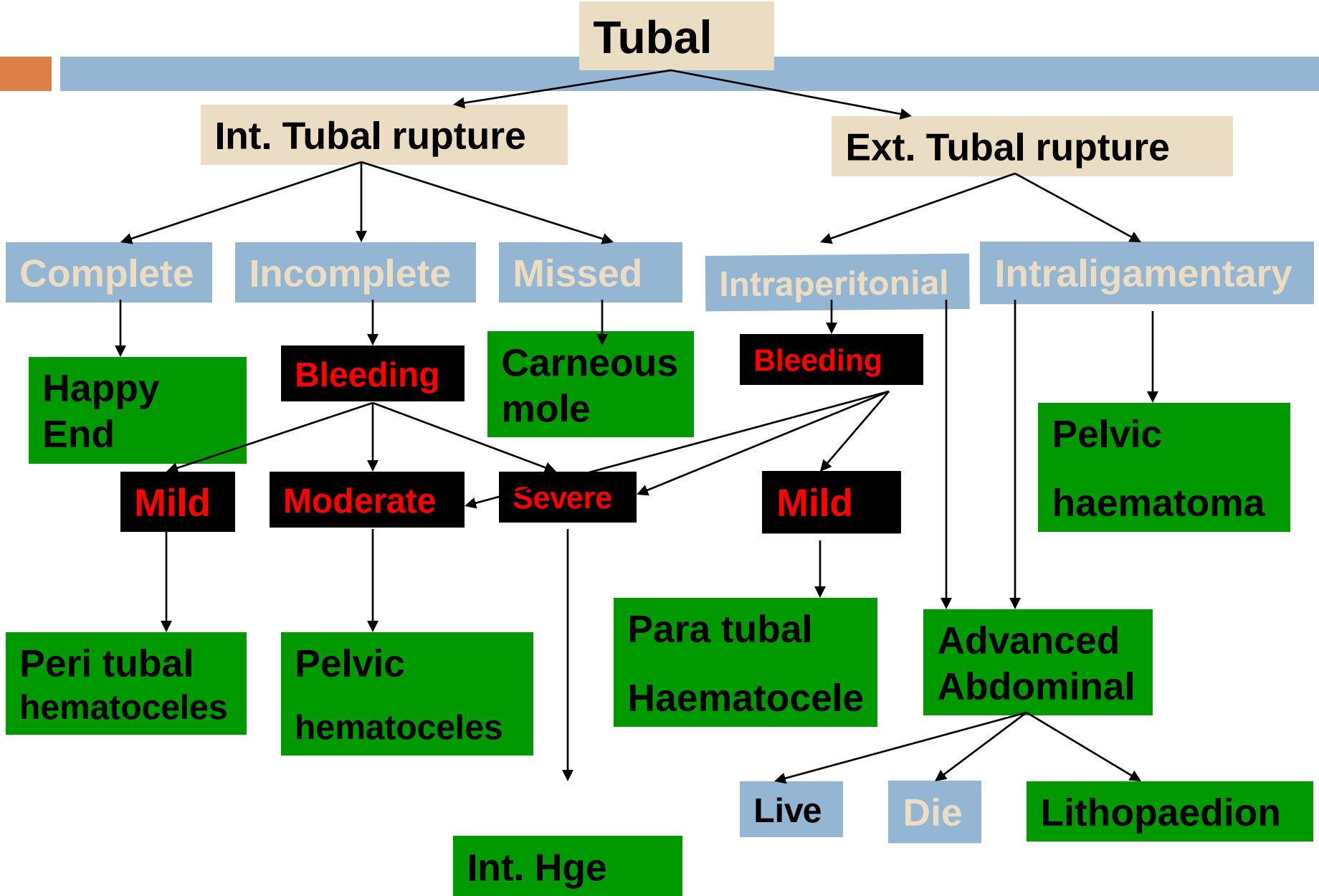
Table 1. Risk Factors for Ectopic Pregnancy

Risk Factor	Risk
High Risk	
Tubal corrective surgery	21.0
Tubal sterilization	9.3
Previous EP	8.3
In utero DES exposure	5.6
IUD	4.2-45
Documented tubal pathology	3.8-21
Moderate Risk	
Infertility	2.5-21
Previous genital infection	2.5-3.7
Multiple partners	2.1
Slight risk	
Previous pelvic or abdominal surgery	0.93-3.8
Smoking	2.3-2.5
Douching	1.1-3.1
Intercourse before 18 weeks	1.6

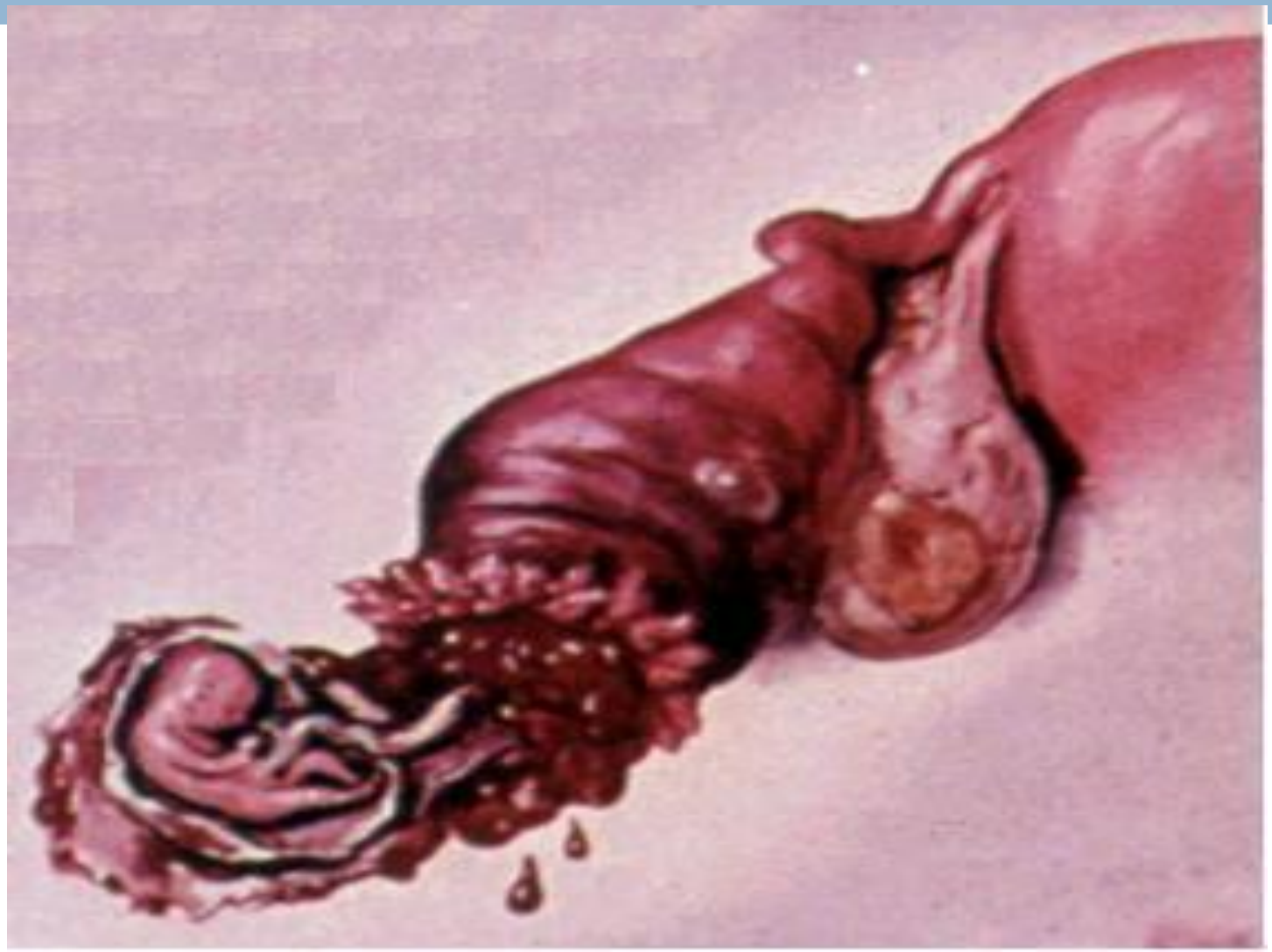


Ectopic Pregnancy

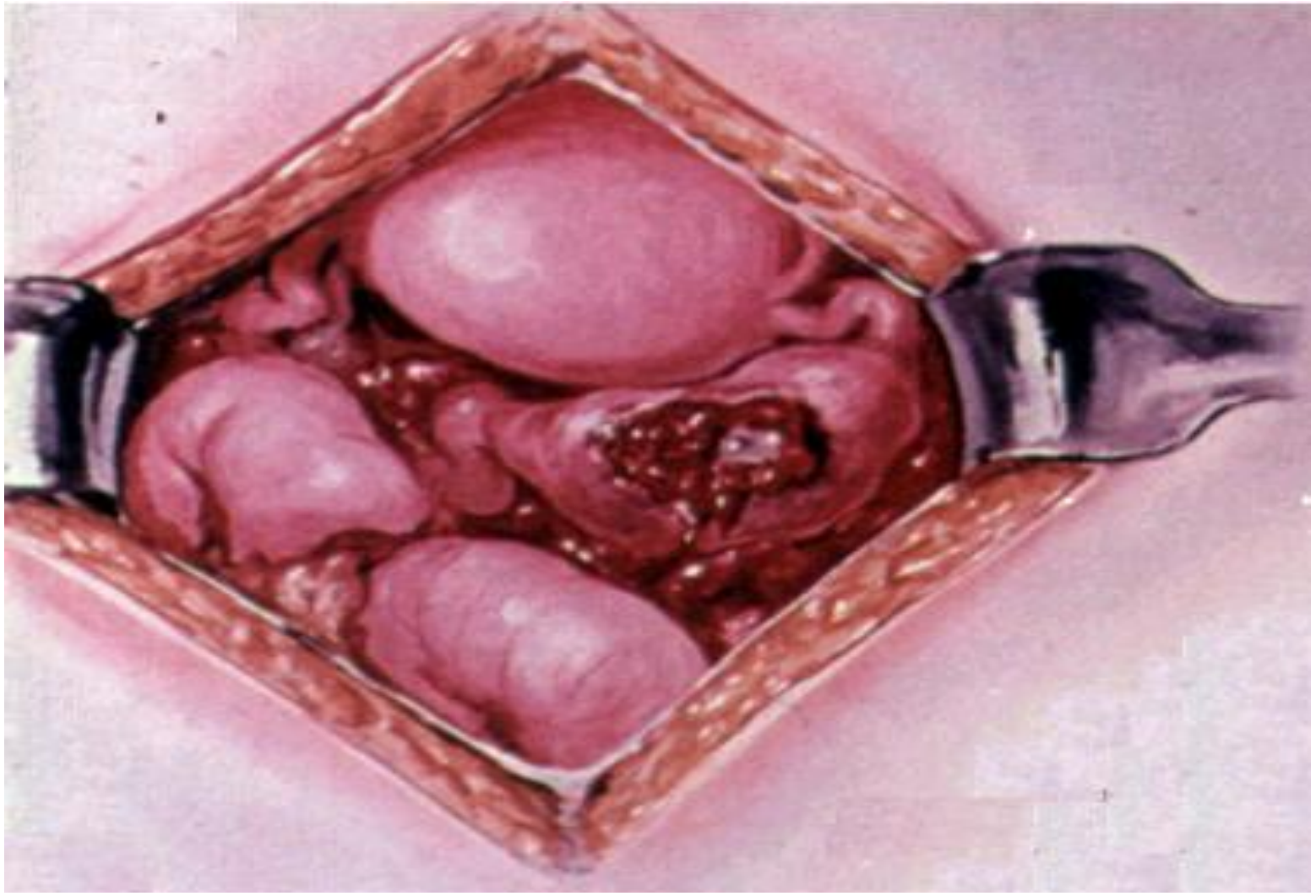
(fate and complication):



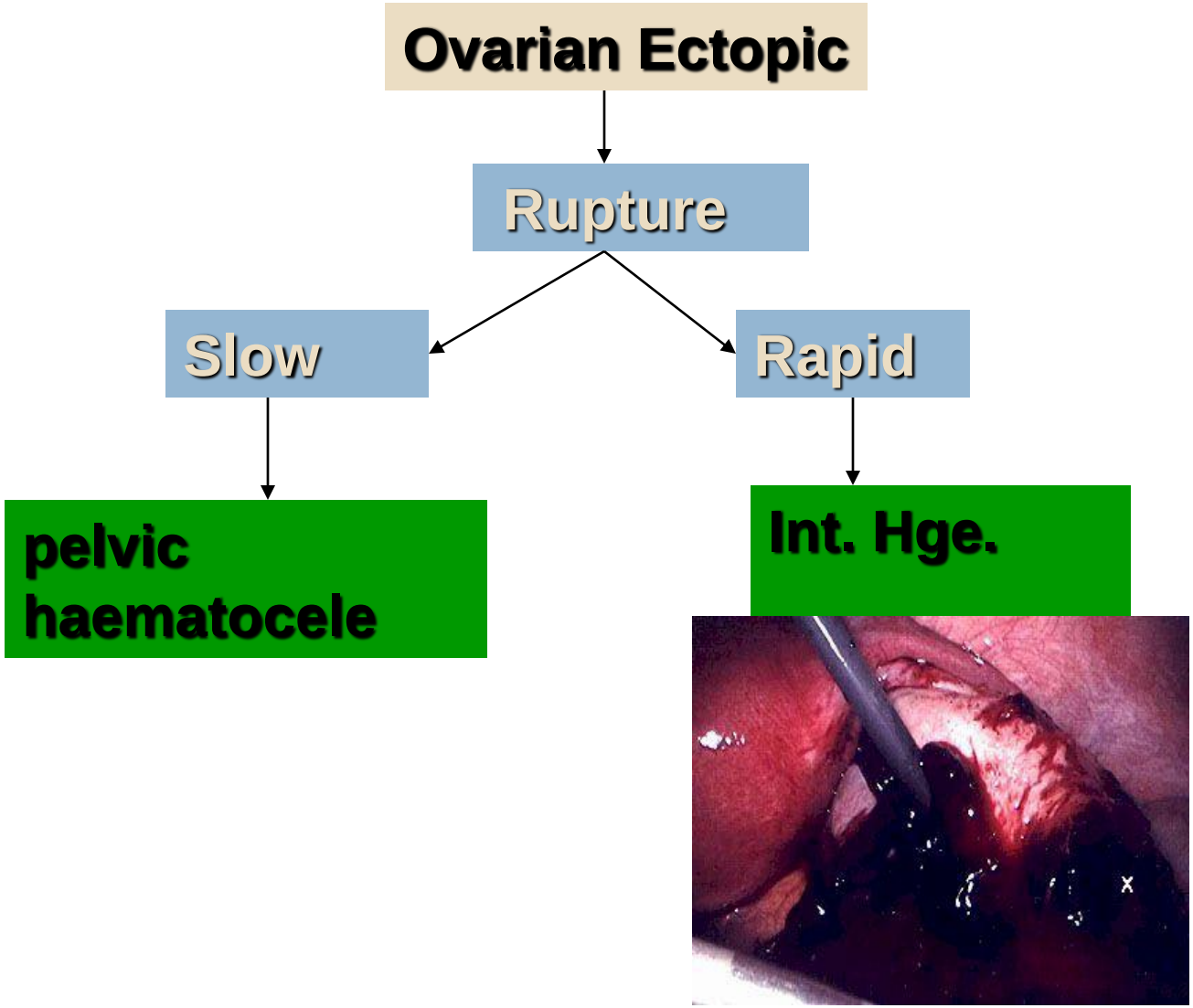
Tubal abortion



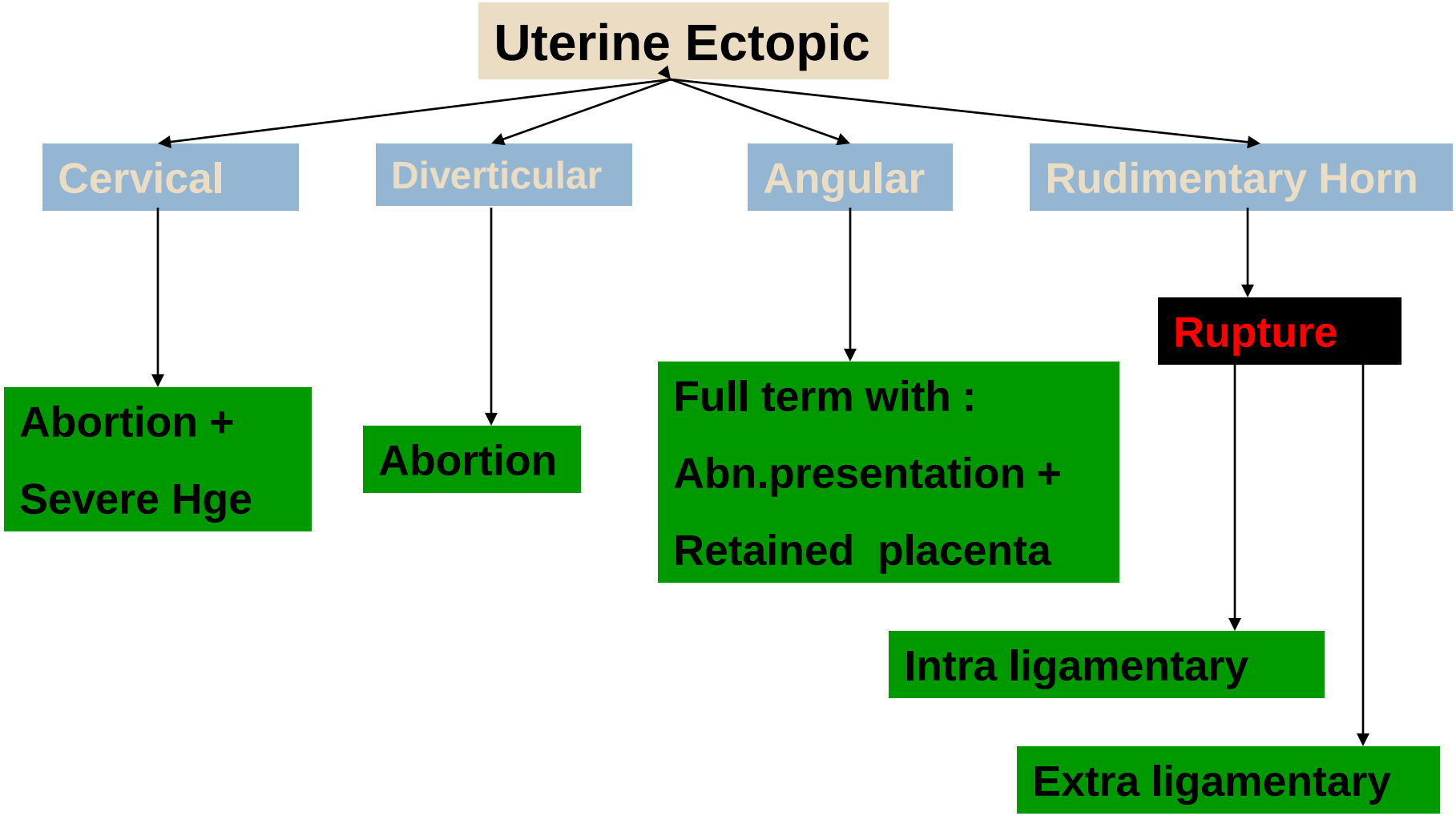
Rupture ectopic



(fate and complication):



(fate and complication):



(fate and complication):

abdominal pregnancy
- if the greater portion of the placenta retains its tubal attachment, further development is possible

broad-ligament pregnancy
- into a space formed between the folds of the broad ligament

#Multifetal ectopic pregnancy

heterotypic ectopic pregnancy
- tubal pregnancy + uterine pregnancy
- 1/30,000 → 1/7,000 (assisted reproduction)
  → 1/900 (ovulation induction)

History

- Classic triad of symptoms
  - **<u>Pain</u>, <u>amenorrhea</u>, <u>vaginal bleeding</u>**
  - Seen in only about 50% of patients
  - Most typical in patients in whom EP has ruptured
  - Abdominal pain – most frequent complaint(any female in child bearing age with acute abdomenal pain and sign of shock ectopic pregnancy must be excluded first}
    - With rupture, the patient may experience transient relief of pain since stretching of the serosa ceases
    - *Shoulder and back pain* – hemoperitoneal irritation of the diaphragm; may indicate intraabdominal hemorrhage

History

- Passage of decidual cast
  - Occurs in 5%-10% of women
  - Their passage may be accompanied by cramps similar to those occurring with a spontaneous abortion

Physical Examination

- Measurement of vital signs
  - With rupture and intraabdominal hemorrhage, the patient develops tachycardia followed by hypotension

Physical Examination

- Examination of the abdomen and pelvis
  - Abdomen may be nontender or tender, with or without rebound
  - Uterus may be enlarged, with findings similar to a normal pregnancy
  - Cervical motion tenderness may or may not be present
  - Bulging of the posterior cul-de-sac
  - Adnexal mass palpable in up to 50% of cases

Sign of ectopic pregnancy:

- intact ectopic: Mass: soft, tender, elastic

  ,pulsating .Nixon sign [unilateral. Pulsation] , Dodd's sign [unlateral. Tenderness]

- If slowly disturb ectopic:

  Pelvic haematocele,Para tubal haematocele,Peri tubal hematocele

Pelvic hematoma

Sign of ectopic pregnancy:

- Sudden Disturbed : **Internal Hemorrhage**

- advance abdominal :

Painful quickening
Tenderness + rigidity
Easy palp.fetal movements + FHM
No Braxton hicks sign
Uterus may be felt separately
Abn. Position + presentation

Table 2. Definitions of Types of Ectopic Pregnancies

Type of EP	Definition
Tubal pregnancy	A pregnancy occurring in the fallopian tube – most often these are located in the ampullary portion of the fallopian tube
Interstitial pregnancy	A pregnancy that implants within the interstitial portion of the fallopian tube
Abdominal pregnancy	Primary – the 1st and only implantation occurs on a peritoneal surface Secondary – implantation originally in the tubal ostia, subsequently aborted and then reimplanted into the peritoneal surface
Cervical pregnancy	Implantation of the developing conceptus in the cervical canal
Ligamentous pregnancy	A secondary form of EP in which a primary tubal pregnancy erodes into the mesosalpinx and is located between the leaves of the broad ligament
Heterotopic pregnancy	A condition in which ectopic and intrauterine pregnancies coexist
Ovarian pregnancy	A condition in which an EP implants within the ovarian cortex

Laboratory tests

- Hematology:
  - Even after substantive hemorrhage, hemoglobin and hematocrit readings may at first show only a slight reduction
    - Hence after an acute hemorrhage, a decrease in hemoglobin or hematocrit level over several hours is a more valuable index of blood loss than the initial reading

Laboratory tests

- hCG assays
  - EP cannot be diagnosed by a positive pregnancy test alone
  - hCG assays positive in over 99% of EPs
  - Sensitive to levels of chorionic gonadotropin of 10-20 mIU/ml
  - The hCG pattern that is most predictive of EP is one that has reached a plateau (doubling time of more than 7 days)

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

Sampling Interval (days)	Increase from Initial Value (%)
1	29
2	66
3	114
4	175
5	255

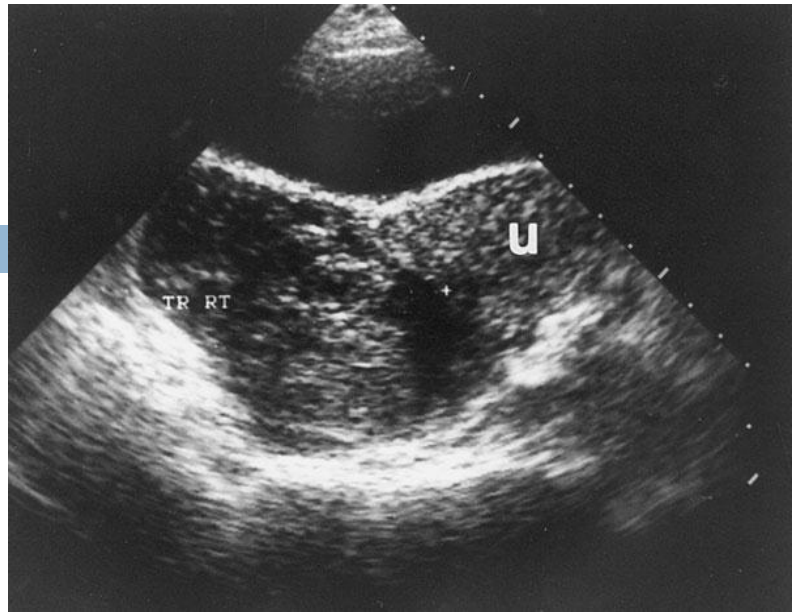
Modified from Kadar and co-workers (1981) with permission.

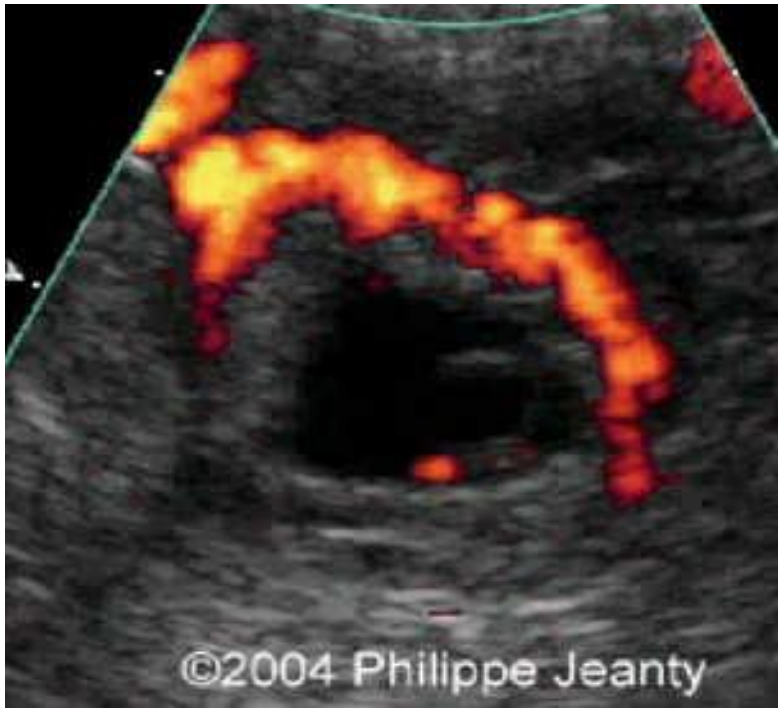
Laboratory tests

- Serum progesterone levels
  - A single progesterone measurement can be used to establish that there is a normally developing pregnancy with high reliability
  - A value exceeding 25 ng/mL excludes EP with 97.5% sensitivity
  - Values below 5 ng/mL occur only in 0.3% of normal pregnancies – suggests a dead fetus or EP

Ultrasound imaging

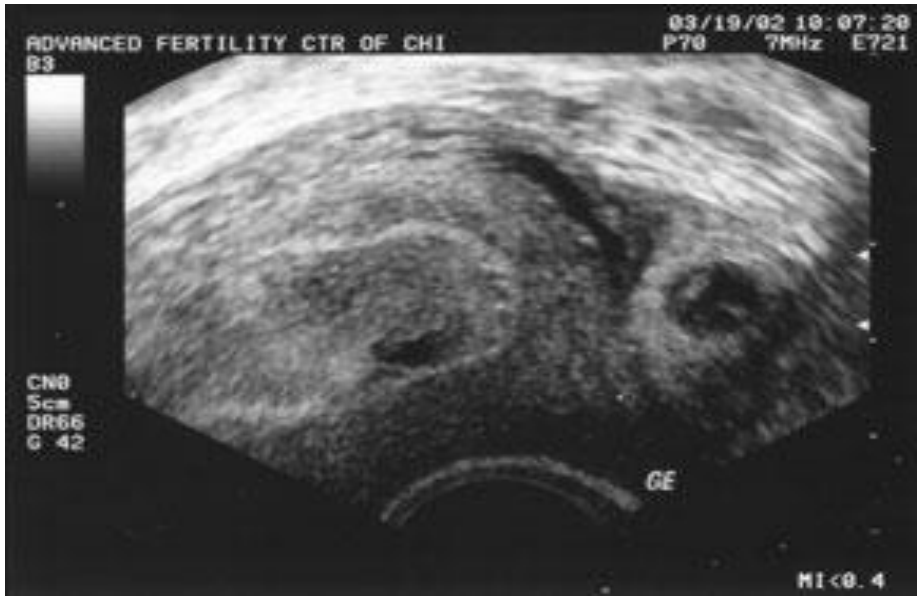
- Abdominal sonography
  - If a gestational sac is clearly identified within the uterine cavity, EP rarely coexists
  - With sonographic absence of a uterine pregnancy, a positive pregnancy test result, fluid in the cul-de-sac, and an abnormal pelvic mass, EP is alsmost certain

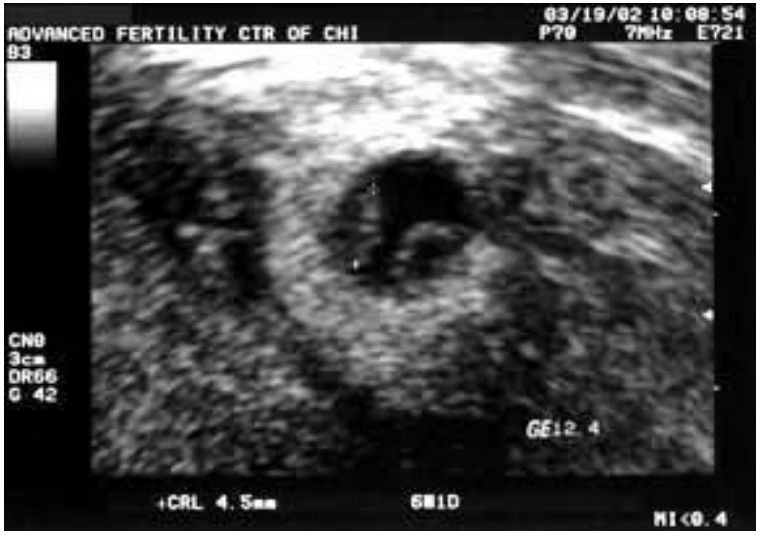


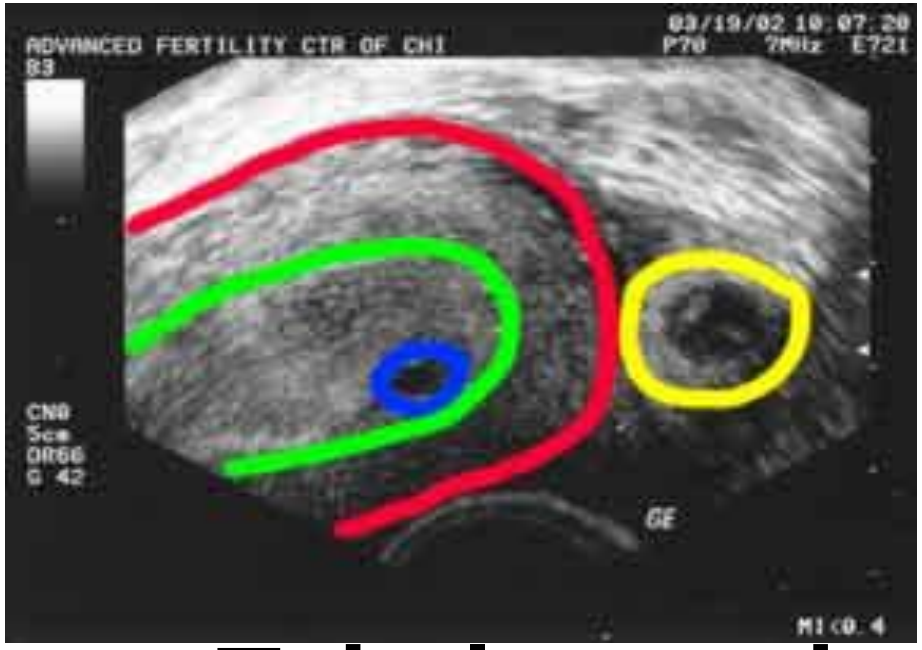


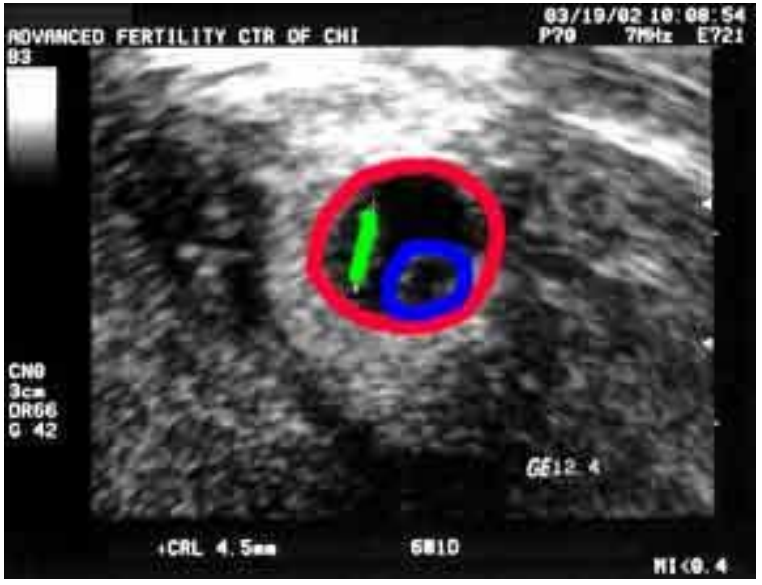
Ultrasound imaging

- Vaginal sonography
  - The imaging of choice in early pregnancy
  - A tubal pregnancy may be missed when the mass is small or obscured by bowel
  - Reported sensitivity for diagnosing EP varies widely from 20% to 80%





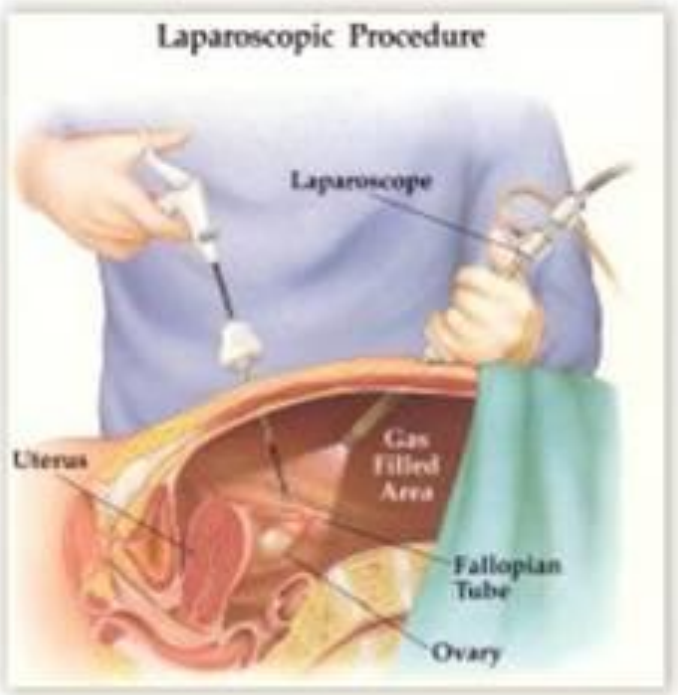




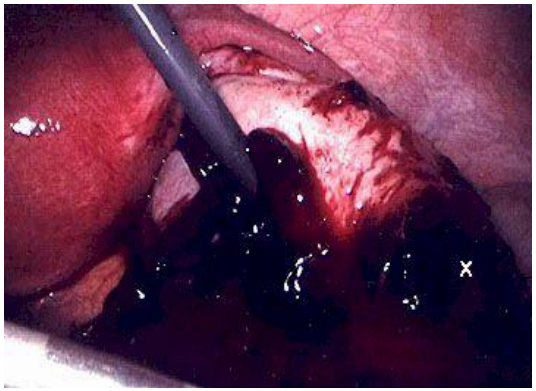
Tubal ectopic with empty uterus

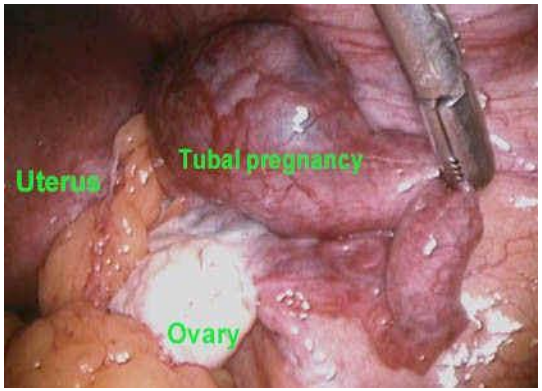
Surgical diagnosis

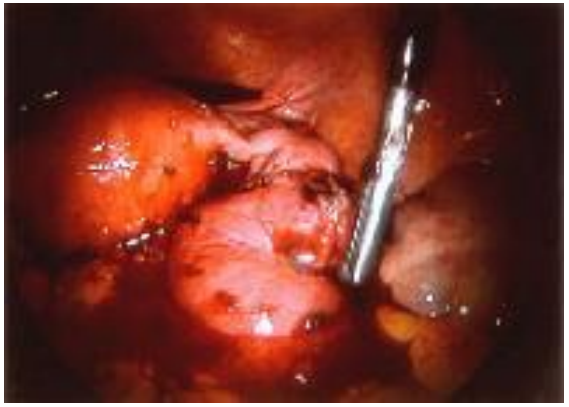
- Laparoscopy
  - Offers a reliable diagnosis in most cases of suspected EP and a ready transition to definitive operative therapy
- Laparotomy
  - Open abdominal surgery is preferred when the woman is hemodynamically unstable or when laparoscopy is not feasible

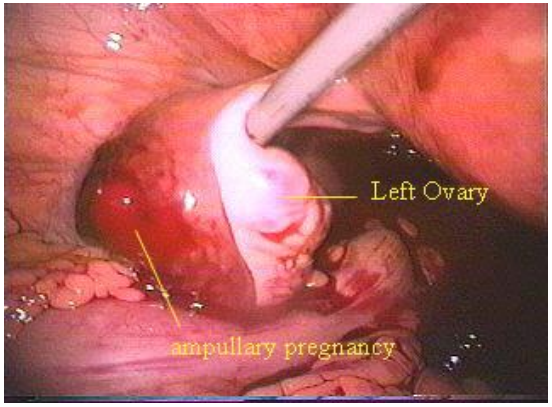


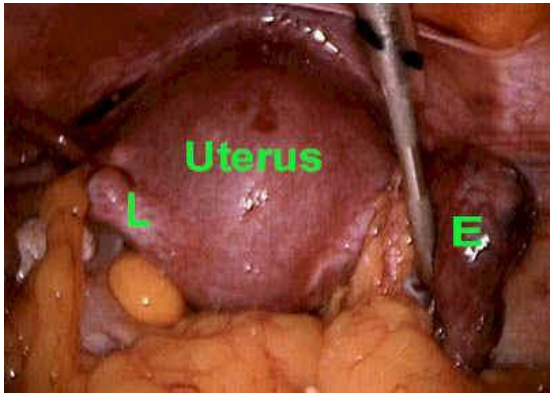
Diagnostic Laparoscopy





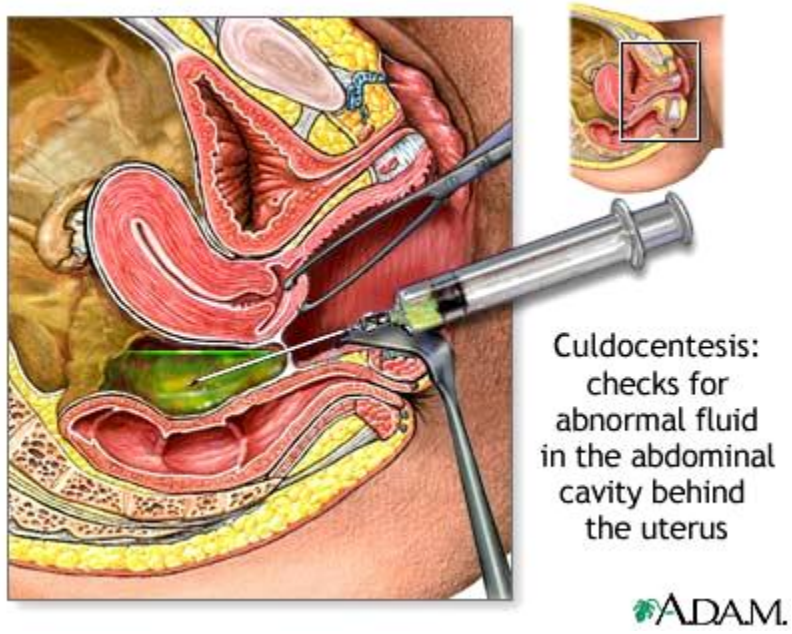






Culdocentesis

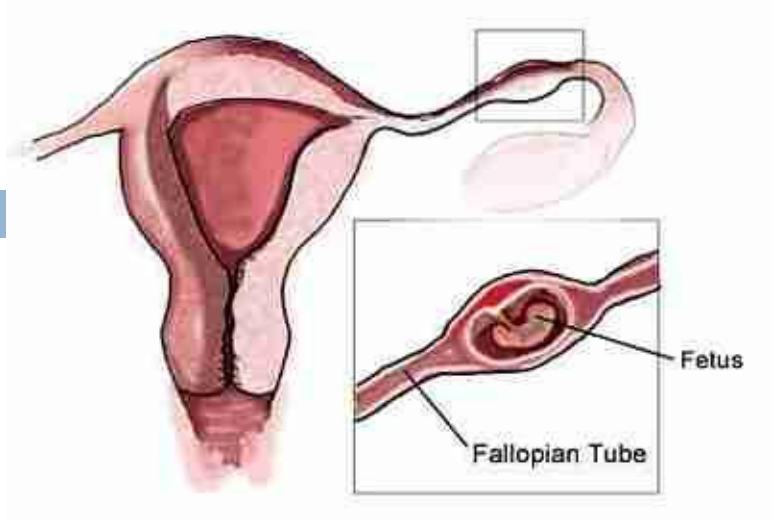
- A simple technique to identify hemoperitoneum
- The cervix is pulled toward the symphysis pubis with a tenaculum
- A long 16- or 18-gauge needle is in into the culdesac
- ***Non-clotting blood aspirated***: compatible with the diagnosis of hemoperitoneum resulting from an EP



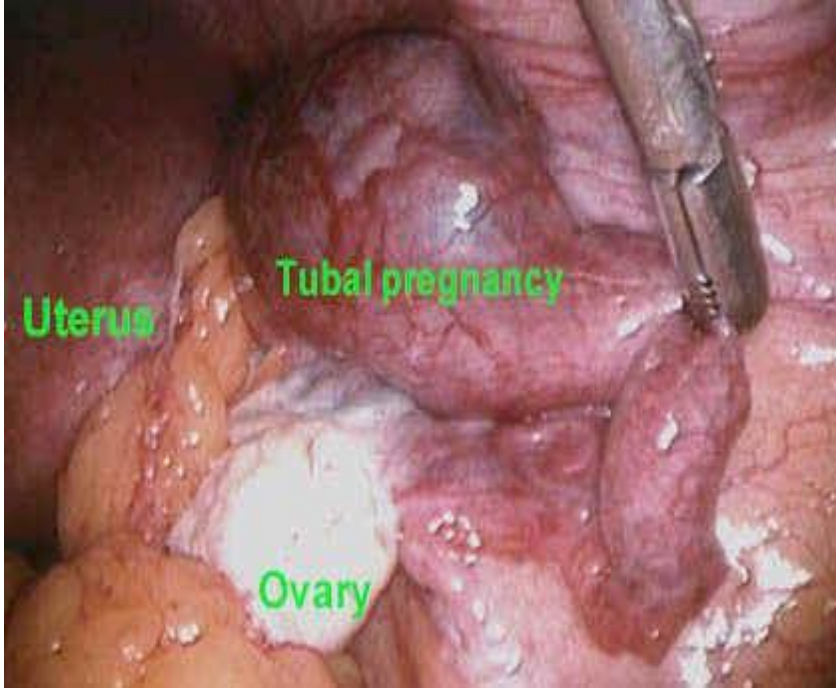
Histologic characteristics

- Evidence of chronic salpingitis and salpingitis isthmica nodosa (SIN)
- Arias-Stella reaction

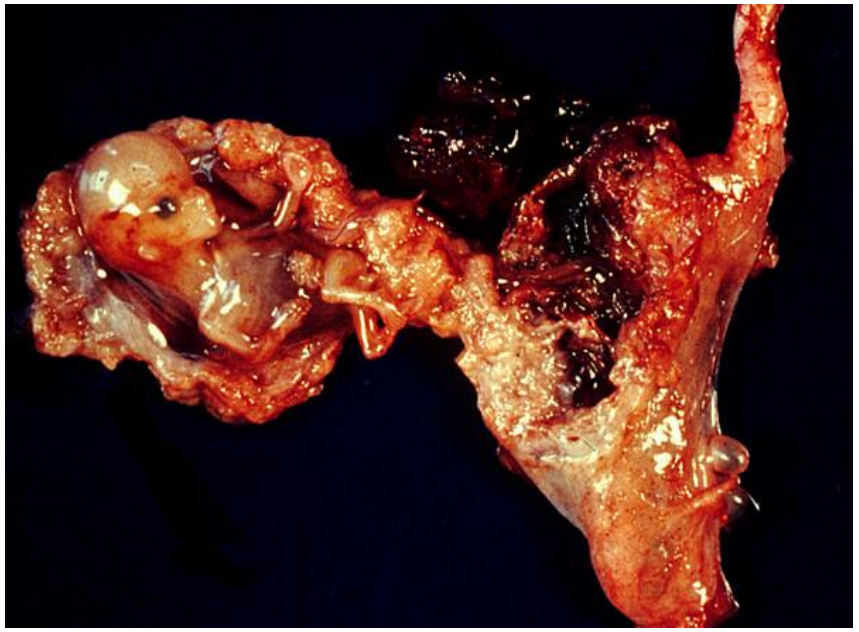
Tubal Pregnancy

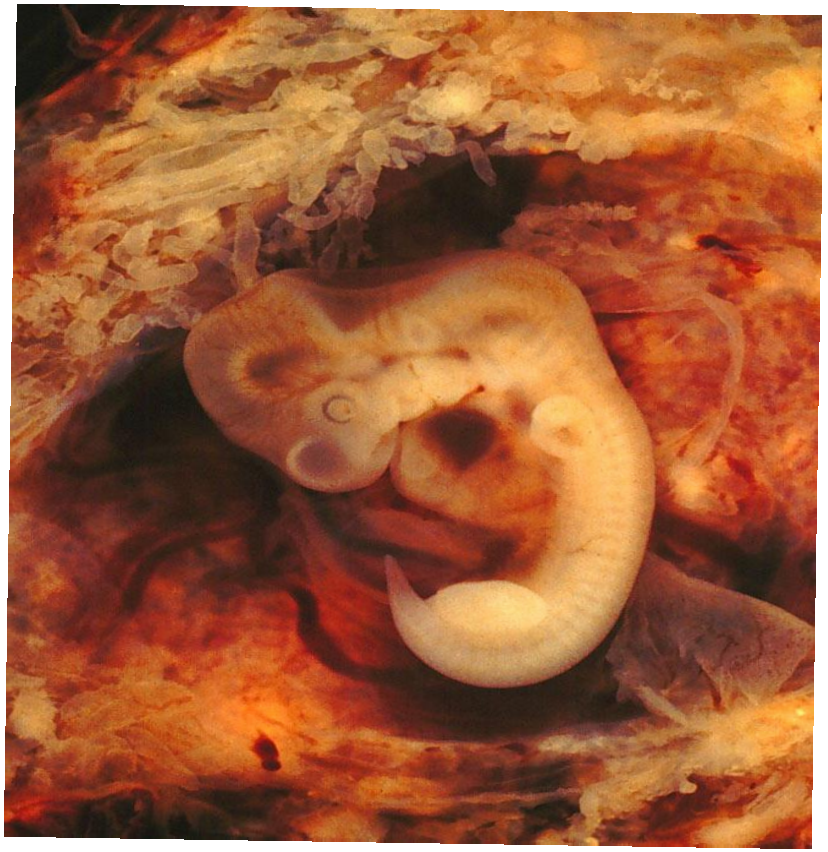


- The fertilized ovum may lodge in any portion of the oviduct, giving rise to ampullary, isthmic, and interstitial tubal pregnancies
- Ampulla is the most frequent site, followed by the isthmus
- Interstitial pregnancy accounts for only 3% of all tubal gestations



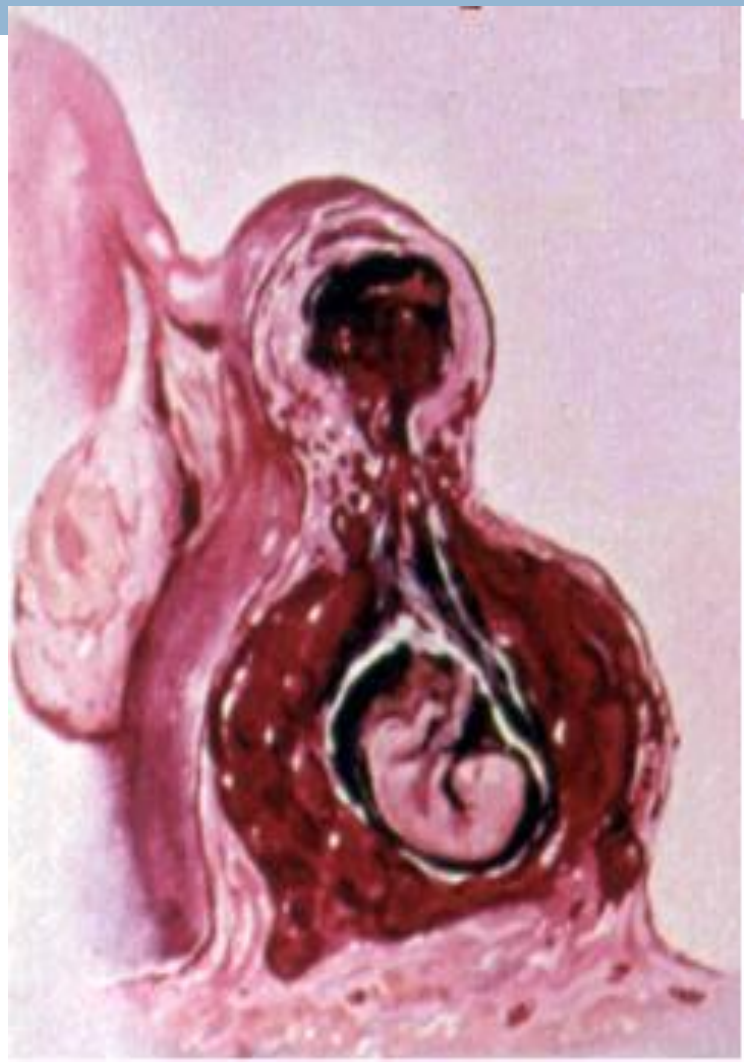
Ampulary Ectopic





Interligamentous pregnancy

- Rare form of EP; 1 in 300 EPs
- Usually results from trophoblastic penetration of a tubal pregnancy through the serosa and into the mesosalpinx, with secondary implantation between the leaves of the broad ligament
- Can also occur if a uterine fistula develops between the endometrial cavity and retroperitoneal space



Tubal Pregnancy

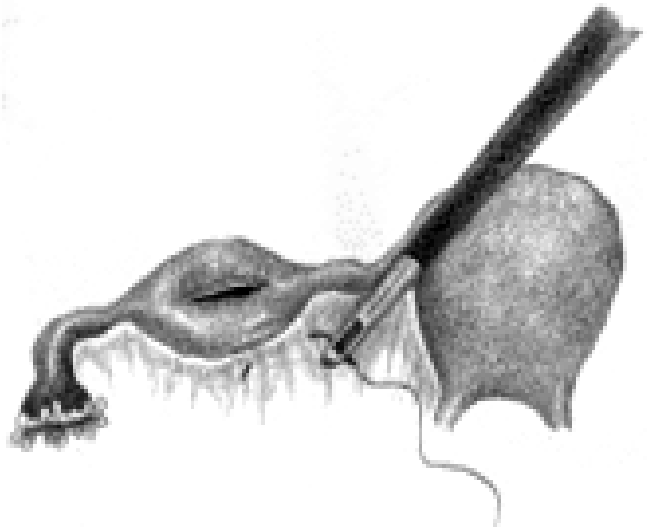
- Treatment
- Resuscitation if patient come with sign of rupture ectopic
  - Anti-D immunoglobulin
    - D-negative women with an ectopic pregnancy who are not sensitized to D-antigen should be given anti-D immunoglobulin

Tubal Pregnancy

- Treatment
  - Surgical Management
    - Laparoscopy is preferred over laparotomy unless the patient is unstable
    - Tubal surgery for EP is considered conservative when there is tubal salvage (salpingostomy, salpingotomy, fimbrial expression of the EP)
    - Radical surgery is defined by salpingectomy

Tubal Pregnancy

- Salpingostomy
  - Used to remove a small pregnancy that is usually less than 2 cm in length and located in the distal third of the fallopian tube
  - A linear incision, 10-15 mm in length or less, is made on the antimesenteric border, immediately above the EP
  - POC extruded out; small bleeding sites controlled with needlepoint electrocautery or laser
  - Incision is left unsutured and to heal by secondary intention



Tubal Pregnancy

- Salpingotomy
  - Essentially the same as salpingostomy except that the incision is closed with 7-0 Vicryl or similar suture
- Salpingectomy
  - May be performed through an operative laparoscope and may be used for both ruptured and unruptured EP
  - When removing the oviduct, it is advisable to excise a wedge of the outer third (or less) of the interstitial portion of the tube (cornual resection)
    - To minimize the rare recurrence of pregnancy in the tubal stump

Tubal Pregnancy

- Segmental resection and anastomosis
  - Resection of the ectopic mass and tubal reanastomosis is sometimes used for an unruptured isthmic pregnancy because salpingostomy may cause scarring and subsequent narrowing of the small isthmic lumen

Tubal Pregnancy

- Medical Management
- Medical management

systemic methotrexate

- folic acid antagonist

effective against rapidly proliferating trophoblast

- success rate ↑ < GA 6 weeks, <3.5cm, β-hCG<15,000 IU/mL fetus is dead

Tubal Pregnancy

<monitoring toxicity>

- liver involve, stomatitis, gastroenteritis
  BM depression, pneumonitis, alopecia
- resolved by 3~4 days after methotrexate was stop

<monitoring efficacy of therapy>

- Other treatment
  - direct injectionof various cytotoxic drugs
    laparoscopy or transvaginally by culdocentesis
  - oral methotrexate therapy two devided doses 2 hours apart for total dose of 60 mg/㎡ with lower success rate

Criteria to receive MTX

Absolute indication

- hemodynamically stable patient with out active bleeding or sign of hemoperitoneum
- Non laparoscopic diagnosis
- Patient desire future fertility
- General anesthesia is risk to patient
- Patient can return to follow up clinic
- No contraindication to MTX

Relative indication

- Relative indications:
- Unruptured mass≤3.5cm at its greatest dimension
- No fetal cardiac motion
- Patient hCG not exceed 6000-15,000 IU/ml

Contraindication to medical therapy

Absolute

- Breast feeding
- Immune deficiency
- Alcoholism or patient with chronic liver disease
- Blood dyscrysis
- Active pulmonary disease
- Peptic ulcer,hepatic,renal ,hematological problem

Relative

- Gestational sac≥3.5 cm
- Embryoic cardiac motion

Methotrexate Therapy for Primary Treatment of Ectopic Pregnancy

Regimen	Follow-up
Single Dose Methotrexate, 50 mg/m^2 IM	Measure β-hCG levels days 4 and 7: ➢ If difference is ≥ 15%, repeat weekly until undetectable ➢ If difference < 15%, repeat methotrexate dose and begin new day 1 ➢ If fetal cardiac activity present day 7, repeat Methotrexate dose, begin new day 1 ➢ Surgical treatment if β-hCG levels not decreasing or fetal cardiac activity persists after three doses of methotrexate
Variable Dose Methotrexate, 1mg/kg IM, days 1, 3, 5, 7 Leukovorin, 0.1 mg/kg IM, days 2, 4, 6, 8	➢ Continue alternate-day injections until β-hCG levels decrease 15% in 48 hr, or four doses methotrexate given ➢ Then, weekly β-hCG until undetectable

Cervical Pregnancy

- 1 in 2,400 to 1 in 50,000 pregnancies (US)
- Conditions that predispose:
  - Previous therapeutic abortion
  - Asherman's syndrome
  - Previous CS
  - DES exposure
  - Leiomyomas
  - IVF

Cervical Pregnancy

- Diagnostic Criteria

1. The uterus is smaller than the surrounding distended cervix
2. The internal os is not dilated
3. Curettage of the endometrial cavity is non-productive of placental tissue
4. The external os opens earlier than in spontaneous abortion

Cervical Pregnancy

- Preoperative preparation should include blood typing and cross-matching, IV access, and detailed informed consent which include the possibility of hysterectomy in the event of hemorrhage
- Surgical management

- in past : hysterectomy

(but, urinary tract injury↑, because the enlarged barrel-shaped cervix)

- *Cerclage* : similar to a McDonald cerclage

Shirodkar cerclage

- *Curettage and Tamponade*

: hemostatic cervical suture at 3 and 9 o' clock→suction curettage, then Foley catheter(30cc)

→vaginal packing tightly

Cervical Pregnancy

- *Arterial embolization*

  : preoperative arterial embolization

  : laparoscopic uterine artery ligation + hysteroscopic endocervical resection

-Medical management

- to avoid the risk of uncontrolled hemorrhage
- chemotherapy is the first choice in stable women (*methotrexate* and other drug)
- other method (not systemically)

  : directly into the gestational sac

    intra- amnionically

Ovarian Pregnancy

- Criteria for diagnosis (Spiegelberg's Criteria)
  1. The fallopian tube on the affected side must be intact
  2. The fetal sac must occupy the position of the ovary
  3. The ovary must be connected to the uterus by the ovarian ligament
  4. Ovarian tissue must be located in the sac wall

Ovarian Pregnancy

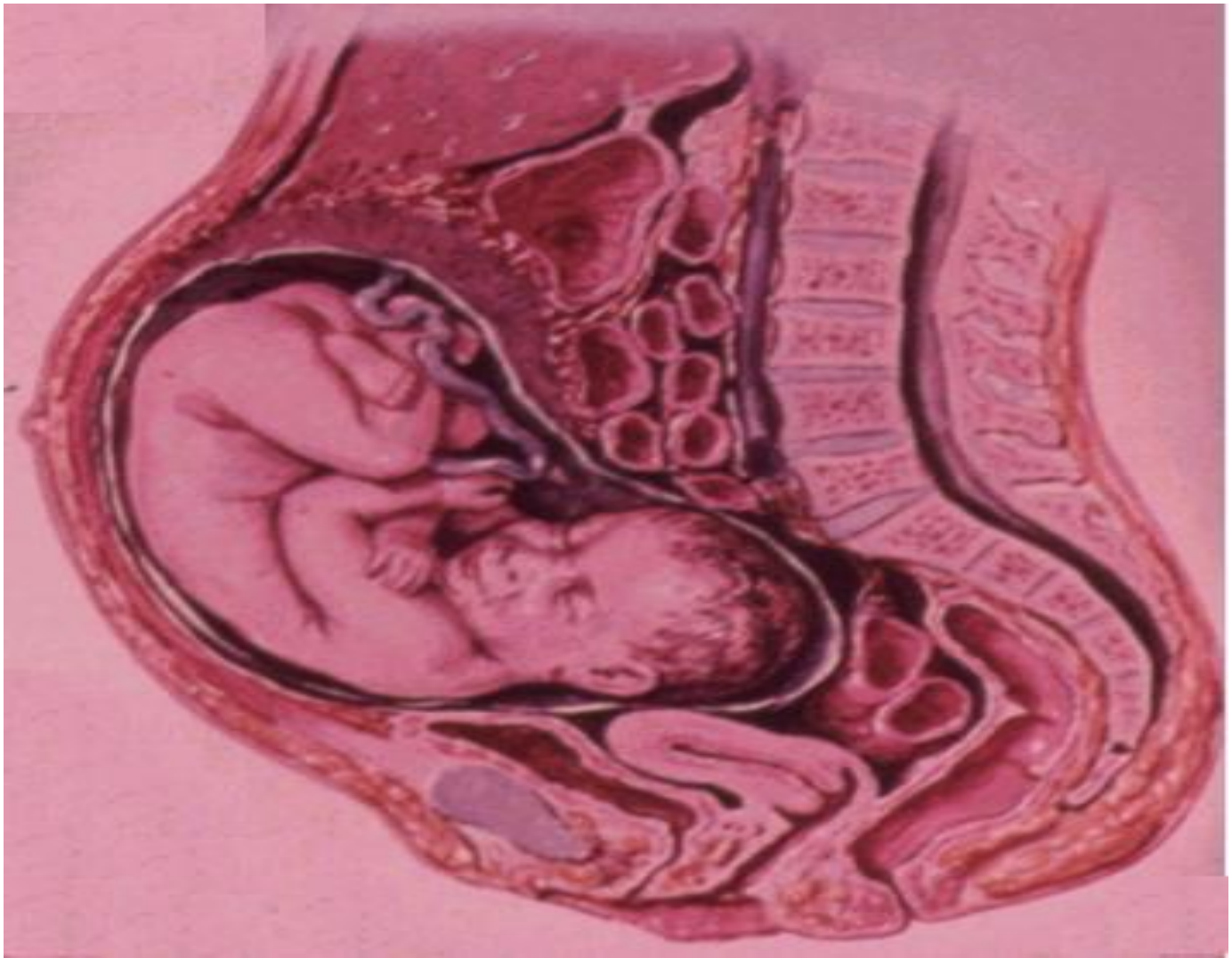
- 0.5% to 1% of all ectopic pregnancies
- Most common type of non-tubal pregnancy
- Misdiagnosis common because it is confused with a ruptured corpus luteum in up to 75% of cases
- Ovarian cystectomy is the preferred treatment
- Treatment with MTX if unruptured and prostaglandin injection has also been reported

Ovarian Pregnancy

Abdominal pregnancy

- Classified as primary(originally abdominal) and secondary
- Secondary abdominal pregnancies are by far the most common and result from tubal abortion or rupture or, less often, from subsequent implantation within the abdomen after uterine rupture
- 1 in 372 to 1 in 9,714 live births
- Incidence of congenital anomalies: 20%-40%

Abdominal pregnancy



Abdominal pregnancy

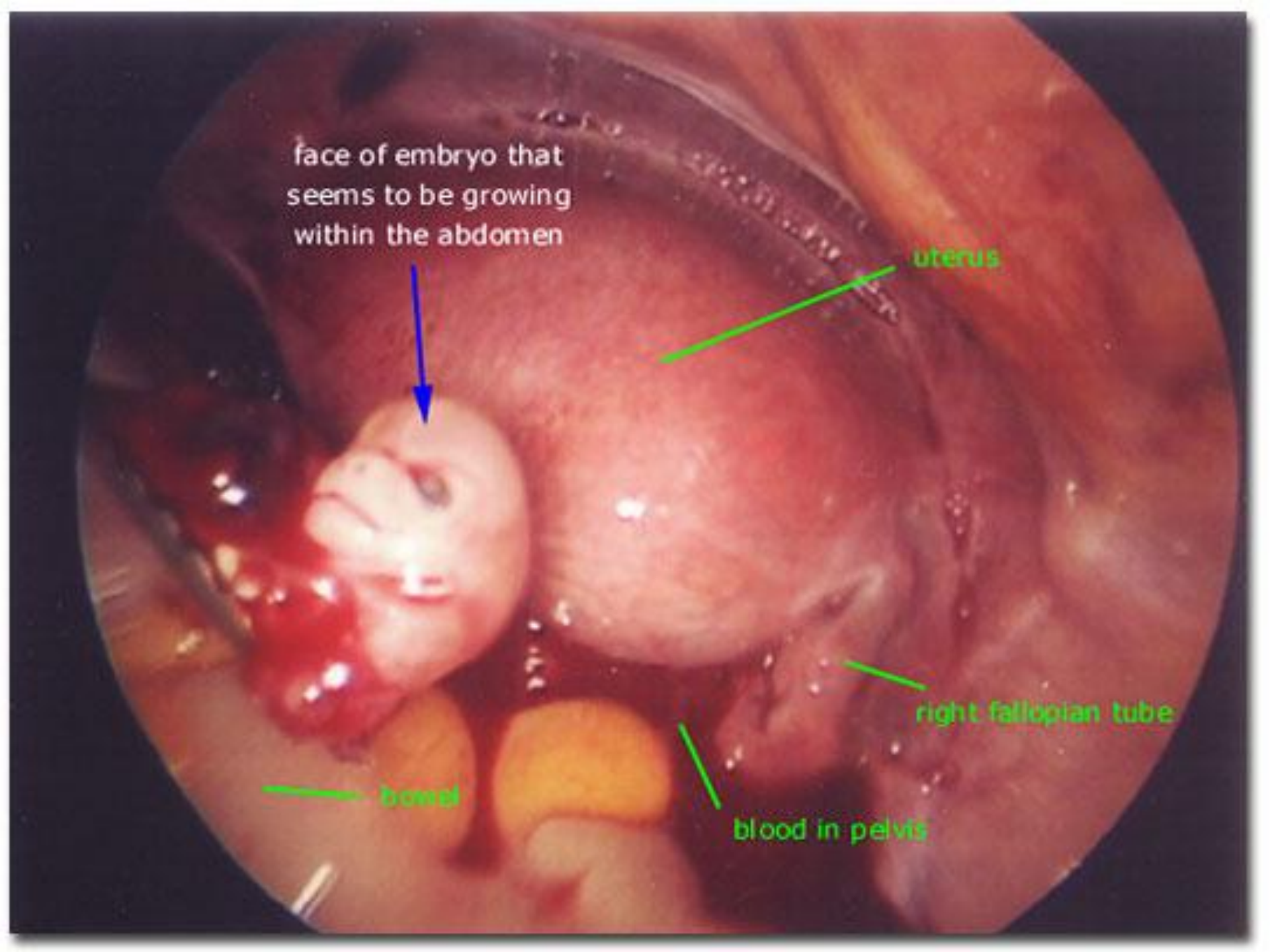
- Clinical presentation
  - In the 1st and early second trimester, the symptoms may be the same as a tubal EP
  - In advanced pregnancy:
    - Painful fetal movement
    - Fetal movements high in the abdomen or sudden cessation of movements
    - Persistent abnormal fetal lies, abdominal tenderness, displaced cervix, fetal superficiality
    - No uterine contractions after oxytocin infusion

Abdominal pregnancy

- Criteria for diagnosis – Studdiford's Criteria
  1. Presence of normal tubes and ovaries with no evidence of recent or past pregnancy
  2. No evidence of uteroplacental fistula
  3. The presence of a pregnancy related exclusively to the peritoneal surface and early enough to eliminate the possibility of secondary implantation after primary tubal abortion

Abdominal pregnancy

- Fetal outcome
  - surviving fetuses may be abnormal
  - fetal deformation : cranial asymmetry
    various joint abnormalities
    fetal malformation: limb deficiency
    CNS anomalies


face of embryo that seems to be growing within the abdomen
uterus
right fallopian tube
bowel
blood in pelvis

Abdominal pregnancy

- Management

- risk for sudden and life-threatening bleeding

: in-hospital management

generally, termination risk of surgery : bleeding due to the lack of constriction of vessels after placental separation(adequate blood supply, monitoring)

laparotomy : vertical midline incision

management of the placenta

- avoid unnecessary exploration of other organ

must be safety removed if possible, blood vessel supplying the placenta should be legated first

if leaving placenta : long-term sequel (infection) resorption (>5years) *methotrexate* use is controversial

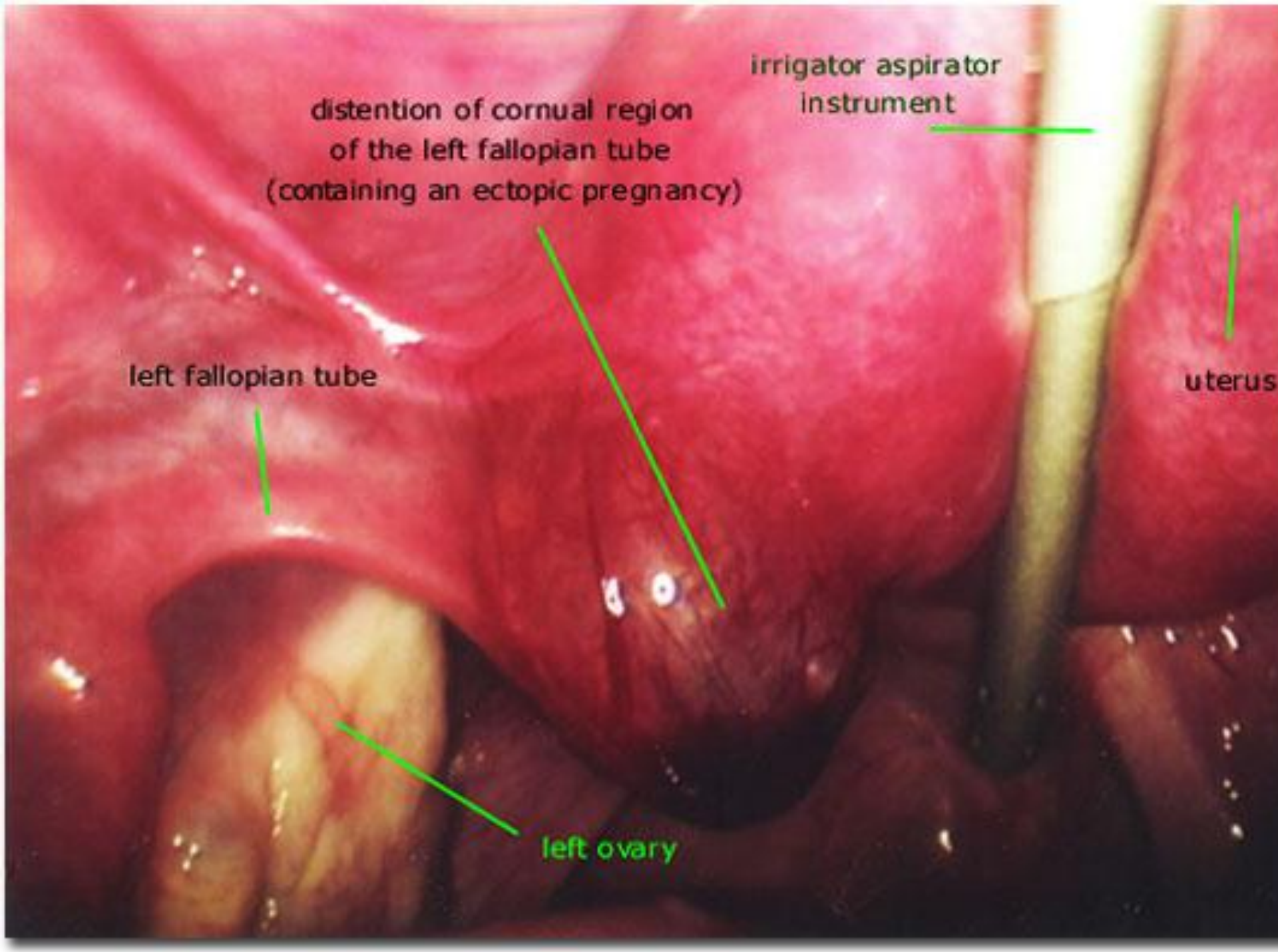
arterial catheterization and embolization

- preoperatively

- lifesaving in massive pelvic hemorrhage

Interstitial pregnancy

- Represent about 1% of EPs
- Patients tend to present later in gestation than those with tubal pregnancies
- Often associated with uterine rupture – represent a large proportion of fatalities from EP
- Treatment: cornual resection by laparotomy


irrigator aspirator
instrument
distention of cornual region
of the left fallopian tube
(containing an ectopic pregnancy)
left fallopian tube
uterus
left ovary

Heterotopic pregnancy

- Occurs when there are coexisting intrauterine and ectopic pregnancies
- 1 in 100 to 1 in 30,000 pregnancies
- Higher in patients who undergo ovulation induction
- Treatment is operative

D.D of ectopic pregnancy

gynecologic problem

- Threatened or incomplete abortion
- Rupture corpus luteum cyst
- Acute PID
- Adnexal torsion
- Degenerating fibroid

Non gynecological problem

- Acute appendicitis
- Pylonephritis
- pancreatitis

Future fertility:

- 60% of woman who develop ectopic will conceive after that
- One ectopic increased risk of other ectopic by 7-13 fold
- 50%-80% that next pregnancy will be intrauterine and 10-15% that it will be ectopic

THANK YOU