Ectopic pregnancy

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Definition

Any pregnancy where the fertilised ovum gets implanted & develops in a site other than normal uterine cavity. (either outside the uterus (Fallopian tube, ovary or abdominal cavity) or in an abnormal position within the uterus (cornua, cervix)).

• Ectopic Pregnancy is a common, life-threatening condition affecting one in 100 pregnancies.
Implantation sites:

- **Tubal pregnancy** (96-98%):
  - *ampullary* portion of the fallopian tube (mid) (80-90%)
  - *isthmic* portion of the fallopian tube (area closer to uterus)
  - *fimbrial* portion of the fallopian tube (distal end away from uterus)
  - *cornual* portion of the fallopian tube (within the uterine muscle)
- **Abdominal** primary/secondary
- **Ovarian**
- **Cervical**
- **Heterotopic** (combination of ectopic + intrauterine pregnancy)
SITES OF ECTOPIC PREGNANCY
1) Fimbrial  
2) Ampullary  
3) Isthemic  
4) Interstitial  
5) Ovarian  
6) Cervical  
7) Cornual-Rudimentary horn  
8) Secondary abdominal  
9) Broad ligament  
10) Primary abdominal  

Ampulla (>85%)  
Isthmus (8%)  
Abdomen (< 2%)  
Cornual (< 2%)  
Ovary  
Cervix
A right tubal ectopic pregnancy seen at laparoscopy
The swollen right tube containing the ectopic pregnancy is on the right at E
The stump of the left tube is seen at L - this woman had a previous tubal ligation
Uncommon Ectopics

- Intraligamentous pregnancy (in broad ligament)
- Pregnancy in a uterine diverticulum or sacculation
- Pregnancy in a rudimentary horn of uterus
- Multiple tubal pregnancy
- Cesarean scar pregnancy
intrauterine implantation
Ectopic implantation
Uterine Changes in Ectopic Pregnancy

- The uterus undergoes some of the changes associated with early normal pregnancy, including increase in size and softening of the cervix and isthmus. (Lack of uterine changes does not exclude an ectopic pregnancy).
  - The finding of uterine decidua without trophoblast suggests ectopic pregnancy but is not absolute.

Arias-Stella reaction:
Histologic findings, which is characterized by localized hyperplasia of endometrial glands that are hypersecretory. The cells have enlarged nuclei that are hyperchromatic and irregular. The Arias-Stella reaction is a nonspecific finding that can be seen in patients with intrauterine pregnancies.

- External bleeding – from degeneration and sloughing of uterine decidua.
The Arias-Stella reaction of the endometrium. The glands are closely packed and hypersecretory with large, hyperchromatic nuclei.
Risk Factors for Ectopic Pregnancy

In theory, any mechanical or functional factors that prevent or interfere with the passage of the fertilized egg to the uterine cavity may be aetiological factors for an ectopic pregnancy.
Known aetiologic factors contributing to the risk of ectopic pregnancy are:

- tubal disease; pelvic infection, such as *Chlamydia* infection, has been estimated to account for 40 per cent of all ectopic pregnancies;
- previous ectopic pregnancy;
- previous tubal surgery;
- subfertility;
- use of intrauterine device.
course and outcome

1. Tubal Abortion

2. Tubal Rupture

3. Continuation of Pregnancy → Secondary Abdominal pregnancy
• Diagnosis can be done by history, detailed examination and investigation.

• History of past PID, tubal surgery, current contraceptive measures should be asked.

• Wide spectrum of clinical presentation from asymptomatic pt to others with acute abdomen and in shock.
The classic symptom triad of ectopic pregnancy is pain, amenorrhea, and vaginal bleeding. This symptom group is present in only about 50% of patients, however, and is most typical in patients in whom an ectopic pregnancy has ruptured.

Abdominal pain is the most common presenting symptom, but the severity and nature of the pain vary widely.

Shoulder pain, thought to result from hemoperitoneal irritation of the diaphragm, may indicate intraabdominal hemorrhage
The physical examination should include measurements of vital signs and examination of the abdomen and pelvis. Frequently, the findings before rupture and hemorrhage are nonspecific, and vital signs are normal.

• **Ruptured ectopic**: patient is restless, looks pale, sweating with cold clammy skin. Features of shock, tachycardia, hypotension.

**Abdomenal**: abdomen may look distended (if significant intraperitoneal haemorrhage is present), tenderness mostly in lower abdomen, rebound tenderness, guarding & rigidity may be present.

**Pelvic**: bimanual examination must be performed in an environment where facilities for resuscitation are available, as this examination may provoke the rupture of the tube.

• Enlarged uterus
• Cervical Motion Tenderness (cervical excitation test)
• adnexal fullness or tenderness, sometime adnexal mass
• Cul-de-sac fullness
• Decidual cast (Passage of decidua in one piece)
• vaginal bleeding may be present
Bimanual examination of the pelvis

a. Assessing the uterus  
b. Assessing the adnexia
Cervical motion tenderness

Fra Janson & Landgrens lærebok: Gynekologi, 2015
CHRONIC ECTOPIC PREGNANCY

• It can be diagnosed by high clinical suspicion.

• Patient had previous attack of acute pain from which she has recovered.

• She may have amenorrhoea, vaginal bleeding with dull pain in abdomen, and with bladder and bowel complaints like dysuria, frequency.

• Pelvic examination reveals that the uterus may be normal in size or bulky, ill defined boggy tender mass may be felt in one of the fornix.
In a woman of child bearing age with pelvic-abdominal pain and/or vaginal bleeding ...... ALWAYS....think 

Ectopic Pregnancy
In recent years, in spite of an increase in the incidence of ectopic pregnancy there has been a fall in the case fatality rate. This is due to the widespread introduction of diagnostic tests and an increased awareness of the serious nature of this disease. This has resulted in early diagnosis and effective treatment.

Now the rate of tubal rupture is as low as 20%. 
METHODS OF EARLY DIAGNOSIS

• Ultrasound scanning – Abdominal & Vaginal including Colour Doppler
• Serum B-hCG: Immunoassay utilising monoclonal antibodies to beta HCG
• Laparoscopy
• Serum progesterone estimation **not** helpful

A combination of these methods may have to be employed.
Diagnosis

- Occasionally culdocentesis

Sometimes dilatation and curettage:
the diagnostic value of curettage is very limited
**Ultra Sonography:**
Transvaginal ultrasound is the diagnostic tool of choice for tubal ectopic pregnancy.

Tubal ectopic pregnancies should be positively identified, if possible, by visualising an adnexal mass that moves separate to the ovary.

Sonographic finding in ectopic pregnancy include the following;-  
- An inhomogeneous or noncystic adnexal mass is the most common finding.  
- An empty extrauterine gestational sac  
- An extrauterine gestational sac containing a yolk sac and/or embryonic pole that may or may not have cardiac activity.  

(Live embryo (fetal heart positive) in adnexa is the most specific but least sensitive sign of ectopic pregnancy, occurring in only 10% to 17% of cases).
In up to 20% of cases, a collection of fluid may be seen within the uterine cavity, classically referred to as a ‘pseudosac’. The key is to distinguish this from an early intrauterine gestational sac.

Free fluid is often seen on ultrasound, but is not diagnostic of ectopic pregnancy. A small amount of anechoic fluid in the pouch of Douglas may be found in both intrauterine and ectopic pregnancies.

-Negative pelvic U/S does not exclude ectopic pregnancy.
2. β-HCG Assay: may be helpful in the diagnosis in the following ways:

* Serum β-HCG test are positive in 99% of ectopic pregnancy

* Serial estimation of β-HCG concentration;

In 85 per cent of pregnancies, the bHCG levels almost double every 48 hours in a normally developing pregnancy. In patients with ectopic pregnancies, the rise of bHCG is often suboptimal. However, bHCG levels can vary widely in individuals and thus often multiple readings are required for comparison purposes.
* β-HCG with U/S (dicriminatory zone);

B-hCG level above which a viable intrauterine pregnancy should be visualized by TV US. This is usually taken as 1000-1500mIU/ml.

With use of transabdominal Sonography a normal intrauterine pregnancy could be seen in most cases when serum β-HCG exceeded 6500 IU/L & with transvaginal Sonography this threshold can be as low as 1500 IU/L.

If there were discrepancy between the bHCG concentrations and that seen on ultrasound scan (e.g. a high bHCG with no intrauterine pregnancy on ultrasound scan), the differential diagnosis of an ectopic pregnancy must be made.

A meta-analysis has confirmed that a single b-hCG level cannot be used in isolation to predict an ectopic pregnancy.

*β-hCG assay is negative (when less than 5 mIU/ml); this mostly exclude ectopic pregnancy.

• A serum beta-human chorionic gonadotrophin (b-hCG) level is useful for planning the management of an ultrasound visualised ectopic pregnancy.
Diagnostic modalities

- If early pregnancy problems.... Urine B-hCG + AScan
  - Intra-uterine pregnancy .......GOOD
  - No Intra-uterine gestation Seen...... serum B-hCG + TVS.
  - with serum B-hCG of 1500-2000 ml I.U/ml Intra uterine gestation should be seen using TVS...... otherwise suspect Ectopic pregnancy
  - When B-hCG below the discriminatory zone.....serial B-hCG estimation or laparoscopy.

The choice of diagnostic algorithm applies only to hemodynamically stable women; those with presumed rupture should undergo prompt surgical therapy
MANAGEMENT

Depending on the presentation:

- **Acute**… with ruptured ectopic and intra-abdominal bleeding….
  ABC„„ + surgical approach.

- **Early stages**, with intact ectopic:

  1. **Expectant**… decreasing B-hCG … Tubal abortion

  2. **Medical**… Depending on size of ectopic and level of B-hCG…..
     Use methotrexate.

  3. **Surgical**
Methotrexate Treatment

- Methotrexate has been found to be equally successful to surgery in certain cases of tubal ectopic pregnancy (overall success rate 65–95%).
- Methotrexate is most commonly given as a single intramuscular dose of 50 mg/m².
- Serum b-hCG levels are measured on days 4 and 7 post methotrexate:
  - If the b-hCG level decreases by more than 15% between days 4 and 7, b-hCG levels are then measured weekly until less than 15 iu/l.
  - If the level does not decrease by 15%, a repeat transvaginal ultrasound should be considered to exclude ectopic fetal cardiac activity and the presence of significant haemoperitoneum. Consideration may then be given to administration of a second dose of methotrexate.
Systemic methotrexate may be offered to suitable women with a tubal ectopic pregnancy. It should never be given at the first visit, unless the diagnosis of ectopic pregnancy is absolutely clear and a viable intrauterine pregnancy has been excluded.
Candidate for methotrexate treatment:

The best candidates for methotrexate treatment are women with:

• asymptomatic ectopic pregnancy,
• who have high compliance,
• serum hCG of < 5000 mIU/ml,
• adnexial mass < 3.5 cm on US scan,
• no cardiac activity on ultrasound
• and no contraindication to methotrexate.
INSTRUCTION TO THE PATIENTS

- If treatment on outpatient basis rapid transportation should be available
- Refrain from alcohol, sunlight, multivitamins, NSAIDs and sexual intercourse.
- Report immediately when vaginal bleeding, abdominal pain, dizziness, syncope (mild pain is common called separation pain or resolution pain)
- Failure of medical therapy require retreatment
- Chance of tubal rupture in 5-10 % require emergency laparotomy.
Contraindications & Side effects of Methotrexate

The few contraindications to medical treatment include:
• (1) chronic liver, renal or haematological disorder;
• (2) active infection;
• (3) immunodeficiency; and
• (4) breastfeeding.

There are also known side effects such as nausea, vomiting, stomatitis, conjunctivitis, gastrointestinal upset, photosensitive skin reaction and about two-thirds of patients suffer nonspecific abdominal pain.
Surgical Treatment Forms

- **Conservative surgery:**
  - A linear incision is made in the intact tube.
  - Forceps are used to remove products of conception.
  - The incision is left to heal without being sutured.

- Salpingostomy: Making an incision on the tube and removing the pregnancy and leaving the incision without suturing.

- Salpingotomy: Procedure is the same as salpingostomy except that the incision is closed with a suture.

- Fimbrial expression: "Milking" the pregnancy out the end of the tube.

- Radical surgery:
  - Salpingectomy: Cutting the tube out.
• **Approach:**
• Usually, if the tube is not ruptured → laparoscopy
• Cases of rupture with significant hemorrhage into the abdomen → laparotomy
• A laparoscopic surgical approach is preferable to an open approach.
• In the presence of a healthy contralateral tube, salpingectomy should be performed in preference to salpingotomy.
• In women with a history of fertility-reducing factors (previous ectopic pregnancy, contralateral tubal damage, previous abdominal surgery, previous pelvic inflammatory disease), salpingotomy should be considered.
Ectopic pregnancy is a life threatening condition & on the increase

Not all cases present with a classical picture

ALWAYS suspect ectopic pregnancy in a woman of a child-bearing age c/o pain and/or p.v. bleeding

Even if woman has ectopic, first urine pregnancy test may be negative!

Early diagnosis and management is feasible, which should be available in referral centers

Tailor your management on the patient presentation. +/- F.up