Ectopic Pregnancy

July 26, 2011 | Fetal Monitoring [1], ObGyn Compensation Survey [2], Pregnancy and Birth [3], Laparoscopy [4], Contraception [5], IVF [6]
By Diaa M. El-Mowafi, MD [7]

It is implantation of the fertilised ovum outside the normal uterine cavity. Common site (95%) : the tubes. Rare sites (5%) : The ovaries, a rudimentary horn of a bicornuate uterus , broad ligaments, peritoneum and cervix.

Definition

It is implantation of the fertilised ovum outside the normal uterine cavity.

• Common site (95%) : the tubes.
• Rare sites (5%) : The ovaries, a rudimentary horn of a bicornuate uterus , broad ligaments, peritoneum and cervix.

TUBAL PREGNANCY
Incidence: about 1:250.

Aetiology
The following risk factors have been implicated:

(A) Mechanical factors:
May prevent or retard the passage of the fertilised ovum into the uterine cavity. These may result from:

1- Previous inflammatory disease:

It is the commonest risk factor. Ectopic pregnancy may occur due to:

- Destruction of tubal ciliated epithelium resulting in reduction or loss of the ciliary current.
- Intratubal adhesions resulting in partial tubal obstruction.
- Peritubal adhesions resulting in restricted tubal motility.

2- Previous pelvic surgery:

Particularly reconstructive tubal surgery.
3- Developmental abnormalities:

as diverticulae, accessory ostia and tubal hypoplasia.

4- Adjacent tumours:

especially in the broad ligament resulting in distortion, stretching or partial obstruction of the tube.

5- Previous ectopic pregnancy:

where conservative treatment was carried out.

6- Intrauterine contraceptive device:

due to its effect on tubal motility or increased incidence of PID.

(B) Premature implantation:
Premature implantation of the fertilised ovum in the tube may occur due to :

1. *Premature shedding of the zona pellucida*: from the fertilised ovum.

2. *Transperitoneal migration of the fertilised ovum to the contralateral tube*: this long journey leads to advanced development of the ovum that it becomes ready for implantation when it reaches the tube. This was proved by presence of the corpus luteum in the contralateral ovary in 50% of ectopic pregnancy.
3. Presence of *ectopic endometrium in the tube*.

**Pathogenesis**

- The trophoblast develops in the fertilised ovum and invades deeply into the tubal wall.
- Following implantation, the trophoblast produces hCG which maintains the corpus luteum.
- The corpus luteum produces oestrogen and progesterone which change the secretory endometrium into decidua. The uterus enlarges up to 8 weeks size and becomes soft.
- The tubal pregnancy does not usually proceed beyond 8-10 weeks due to:
  - lack of decidual reaction in the tube,
  - the thin wall of the tube,
  - the inadequacy of tubal lumen,
  - bleeding in the site of implantation as trophoblast invades.
- Separation of the gestational sac from the tubal wall leads to its degeneration, and fall of hCG level, regression of the corpus luteum and subsequent drop in the oestrogen and progesterone level.
- This leads to separation of the uterine decidua with uterine bleeding.

**Fate of tubal pregnancy:**

**(I) Tubal mole:**
The gestational sac is surrounded by a blood clot and retained in the tube.

**(II) Tubal abortion:**

- This occurs more if ovum had been implanted in the ampullary portion of the tube.
- Separation of the gestational sac is followed by its expulsion into the peritoneal cavity through the tubal ostium.
- Rarely, reimplantation of the conceptus occurs in another abdominal structure leads to *secondary abdominal pregnancy*.
- If expulsion was complete the bleeding usually ceases but it may continue due to incomplete separation or bleeding from the implantation site.

**(III) Tubal rupture:**
- More common if implantation occurs in the narrower portion of the tube which is the isthmus.
- Rupture may occur in the anti-mesenteric border of the tube. Usually profuse bleeding occurs ® intraperitoneal haemorrhage.
- If rupture occurs in the mesentric border of the tube a broad ligament haematoma will occur.

Clinical Picture

**General symptoms:**

1. **Short period of amenorrhoea:**
   Usually does not exceed 8-10 weeks. This may be lacking if the ectopic pregnancy is disturbed before the next menstruation. This may occur particularly with ectopic pregnancy in the interstitial portion of the tube.

2. **Pain:**
   is present in almost every case and precedes vaginal bleeding. It may be:
   
   a. Aching due to tubal distension.
   b. Colicky in tubal abortion.
   c. Stabbing in tubal rupture.
   d. Shoulder pain if blood accumulates under the diaphragm.
   e. Bladder and rectal irritability in pelvic haematocele.

3. **Vaginal bleeding:**
   Due to shedding of the decidua. It is usually slight and follows the pain.

**General signs:**

**General examination:**
Breast signs of pregnancy.

**Abdominal examination:**
Lower abdominal tenderness and rigidity especially on one side may be present.

**Vaginal examination:**

- Bluish vagina and bluish soft cervix.
- Uterus is slightly enlarged and soft.
- Marked pain in one iliac fossa on moving the cervix from side to side.
- Ill defined tender mass may be detected in one adnexa in which arterial pulsation may be felt.

The other manifestations depend upon the clinical variety of the ectopic pregnancy:

(A) Undisturbed Tubal Pregnancy
   It is the same general symptoms and signs mentioned before. The pain is aching in nature and there is no vaginal bleeding.

(B) Tubal Abortion
   The more common so it is called the classical picture of ectopic pregnancy.

**Symptoms:**
1. The general symptoms and signs are present.
2. Fainting attacks due to pain and intraperitoneal haemorrhage.
3. Nausea and vomiting due to peritoneal irritation.

**Signs:**

*General examination:*

1. Anaemia of varying degree depending upon the blood loss.
2. Pulse is usually rapid.
3. Temperature slightly higher (up to 38°C) due to absorption of blood from the peritoneal cavity.
4. Blood pressure: falls in proportion to the amount of internal haemorrhage.

*Abdominal examination:*

*Cullen’s sign:* a periumbilical bluish discoloration may be present due to absorption of the blood in the peritoneal cavity by lymphatics. It is a late sign.

*Local examination:*

*Boggy swelling in the cul-de-sac* if pelvic haematocele is present.

(C) Tubal Rupture
The most dramatic although not the most common.

**Symptoms:**

Short period of amenorrhoea (6-8 weeks) or even there is no missed period.

**Signs**

*General examination:*

- Rapidly developed shock, with pallor, sweating, air hunger, rapid thready pulse and hypotension.
- Shoulder tip pain and hiccoughs due to irritation of the phrenic nerve of the diaphragm by accumulated blood when the patient lying down
Abdominal examination:

- The abdomen is distended, rigid with generalised tenderness.
- Shifting dullness and periumbilical bluish discolouration due to intraperitoneal haemorrhage.

Local examination:
The same as in general signs of ectopic, although it is undesirable as it may induce more disruption and bleeding.

(D) Pelvic Haematocele

Symptoms:

1. Symptoms suggesting disturbed tubal pregnancy since a period of time.

2. Pressure symptoms due to accumulation of blood in the Douglas pouch as frequency of micturition, tenesmus and dyspareunia.

Signs:

1. A fixed tender swelling is felt in Douglas pouch.

2. The uterus is slightly enlarged, soft and pushed forwards and the external os is directed downwards.

3. Aspiration of Douglas pouch (culdocentesis) may reveal blood which does not clot on standing. If blood clots it means that needle has punctured a blood vessel.

4. Infection may be superadded and a pelvic abscess is formed.

Investigations of Ectopic Pregnancy

(1) Serum b-hCG:

Urine pregnancy tests are positive in only 50-60% of ectopic. Detection of b-hCG in the serum by ELISA or radioimmunoassay are more sensitive and can detect very early pregnancy about 10 days after fertilisation i.e. before the missed period.

- If the test is negative, normal and abnormal pregnancy including ectopic are excluded.

- If the test is positive, ultrasonography is indicated.

Doubling time:

- In normal pregnancy, the b-hCG level is doubling every 48 hours during the first 42 days of gestation.
Ectopic pregnancy usually shows less than 66% increase in b-hCG level within 48 hours.

Unfortunately, this is not specific to ectopic pregnancy. In 15% of normal pregnancies as well as in abortions there is also slow doubling time.

N.B. Alpha-hCG subunit level is higher in ectopic pregnancy than normal gestations.

(2) Ultrasonography:

In general, a positive b-hCG test with empty uterus by sonar indicates ectopic pregnancy. This is true if the hCG is at or above the threshold level in which an intrauterine gestational sac can be detected. This is called discriminatory zone.

**Discriminatory hCG zones:**

Diagnosis of ectopic pregnancy is made if there is:

1. An empty uterine cavity by abdominal sonography with b-hCG value above 6000 mIU/ml.
2. An empty uterine cavity by vaginal sonography with b-hCG value above 2000 mIU/ml.

(3) Progesterone:

Serum progesterone level is lower in ectopic than normal pregnancy and usually less than 15ng/ml.

(4) Culdocentesis:

If non-clotting blood is aspirated from the Douglas pouch through a wide pored needle, intraperitoneal haemorrhage is diagnosed. But if not, ectopic pregnancy cannot be excluded.

(5) Curettage:

- If microscopic examination of the products of curettage reveals decidua and chorionic villi, the condition is abortion of intrauterine pregnancy.
- If it reveals decidua only or Arias Stella reaction in the endometrium as well (cellular atypism, mitotic activity and glandular proliferation), ectopic pregnancy is diagnosed. The drawback is that in complete abortion also decidua only is curetted.

(6) Laparoscopy:
A good diagnostic aid particularly in disturbed ectopic.

(7) Complete blood picture:
- Haemoglobin and haematocrit ---- to assess anaemia.
- Leucocytic count ---- exclude infections as appendicitis and salpingitis.

Uncommon Sites of Ectopic Pregnancy

(I) Cornual angular pregnancy:

- It is implantation in the interstitial portion of the tube.
- It is uncommon but dangerous because when rupture occurs bleeding is severe and disruption is extensive that it needs hysterectomy.
- In some cases, the pregnancy is expelled into the uterus and rupture does not occur.

(II) Pregnancy in a rudimentary horn:

- Pregnancy occurs in the blind rudimentary horn of a bicornuate uterus.
- As such a horn is capable of some hypertrophy and distension, rupture usually does not occur before 16-20 weeks.
- Treatment: Excision of the horn. During operation, pregnancy in a rudimentary horn can be differentiated from interstitial cornual tubal pregnancy by finding the attachment of the round ligament lateral to the first and medial to the later.

(III) Cervical pregnancy:

- Implantation in the substance of the cervix below the level of uterine vessels.
- May cause severe vaginal bleeding.

Treatment:

1. Evacuation and cervical packing with haemostatic agent as fibrin glue and gauze.
2. If bleeding continues or extensive rupture occurs hysterectomy is needed.

(IV) Ovarian pregnancy:

Aetiology:

1. Pelvic adhesions.

2. Favourable ovarian surface for implantation as in ovarian endometriosis.

Pathogenesis:

- Fertilisation of the ovum inside the ovary or,
- implantation of the fertilised ovum in the ovary.

Spiegelberg criteria for diagnosis of ovarian pregnancy:
1. The gestational sac is located in the region of the ovary,
2. the ectopic pregnancy is attached to the uterus by the ovarian ligament,
3. ovarian tissue in the wall of the gestational sac is proved histologically,
4. the tube on the involved side is intact.

**Treatment:**

Laparotomy and inoculation of the ectopic pregnancy and reconstruction of the ovary if possible. Otherwise, removal of the affected ovary is indicated.

**(V) Abdominal (peritoneal) pregnancy:**

**Types:**

1. *Primary*: implantation occurs in the peritoneal cavity from the start.
2. *Secondary*: usually after tubal rupture or abortion. Intraligamentous pregnancy: is a type of abdominal but extraperitoneal pregnancy. It develops between the anterior and posterior leaves of the broad ligament after rupture of tubal pregnancy in the mesosalpingeal border or lateral rupture of intramural (in the myometrium) pregnancy.

**Diagnosis:**

**(A) History:**

of amenorrhoea followed by an attack of lower abdominal pain and slight vaginal bleeding which subsided spontaneously.

**(B) Abdominal examination:**

- Unusual transverse or oblique lie.
- Foetal parts are felt very superficial with no uterine muscle wall around.

**(C) Vaginal examination:**

- The uterus is soft, about 8 weeks and separate from the foetus.
- No presenting part in the pelvis.

**(D) Special investigations:**
1. Plain X-ray: shows abnormal lie. In lateral view, the foetus overshadows the maternal spines.

2. Ultrasound: shows no uterine wall around the foetus.

3. Magnetic resonance imaging (MRI): has a particular importance in preoperative detection of placental anatomic relationships.

**Differential Diagnosis:**
Rupture uterus.

**Treatment:**
The condition should be terminated surgically through laparotomy once diagnosed as the foetus is malformed in the majority of cases. In addition, there is risk of massive internal haemorrhage if separation of the placenta occurs.

At least 2000 ml of cross-matched blood should be on hand before proceeding to laparatomy. The foetus is removed and if the placenta is attached to an excisable structure as omentum, it is removed with it. If the placenta is attached to an important structure leave it for autolysis which may extend to few months or years. Any attempt to separate placenta will evoke uncontrollable bleeding. In this case, methotrexate 12.5 mg IM daily for 5 days will destroy trophoblastic tissue and accelerates the involution of the placenta.

In rare cases, the foetus may reach full term where spurious (false) labour occurs and the foetus dies if not recognised.

**Source URL:** [http://www.obgyn.net/fetal-monitoring/ectopic-pregnancy-0](http://www.obgyn.net/fetal-monitoring/ectopic-pregnancy-0)

**Links:**
[7] http://www.obgyn.net/authors/diaa-m-ei-mowafi-md