8 Ectopic pregnancy

• **Definition**: it's a pregnancy that is located outside the uterine cavity. (Not outside the uterus cause cervix implant is an ectopic pregnancy).

• **Incidence**: Doubled after ARTs to [2-3%]

• Usually found in the first **6-8 weeks** of pregnancy; but later if not located in the tube.
• **Heterotopic** pregnancy.(1/30,000).

• **Site**
1-**Fallopian tubes** (>95%)
Ampulla: most common site, the widest part 5-6 mm
Isthmus: wall is thicker
Fimbria
*both isthmus and ampulla ectopic pregnancy need short weeks of amenorrhea to appear. (Ampulla needs 6-7 week, isthmus <6 week)
2-**uterine cornea**: need 10 weeks to appear, the most dangerous due to risk of rupture
3-**cervical**: 0.15-0.2%
4-**ovarian**: 1-2%
5-**abdomin**:1-2%
6- **C/S scar:** intramural(1/1800)
There will be placenta on the bowel of this type may continue and reach term.
*4&5 type happen secondary to tubal abortion
*the most common type of ectopic pregnancy is ampulla and the second most common is abdominal.

Mortality risks
• Before the 19th century, → **exceeded 50%.**
• By the end of the 19th century, dropped to **5%.**
• Current advances in early detection, improved to **less than 5 in 10,000.**
• Remains the leading cause of **pregnancy related death in the first trimester** of pregnancy.

Strong Risk Factors
1. previous ectopic pregnancy
2. previous tubal sterilization surgery
3. intrauterine device (IUD) use
4. previous genital infections
5. chronic salpingitis
6. salpingitis isthmica nodosa
7. infertility
8. multiple sexual partners
9. smoking

Week Risk Factors
1. assisted reproductive technology (ART)
2. first sexual encounter <18 years
3. Maternal age > 35 years
4. tubal reconstruction surgery

Land Marks
• The **most common cause of tubal abnormality** associated with **ectopic pregnancy** is **salpingitis**.
• **Chromosomal** abnormalities **do not cause ectopic** pregnancies.
• A role for the conceptus.

Incidence/ Sites

	Natural Conception	ARTs
Overall incidence	About 1%	2-3%
Fallopian tube	> 95%	< 90%
Ovarian &abdominal	1-2%	5%
Cervical	0.15%	1.5%
Cesarean scar	1 in 1800	Unknown
Heterotropic	1 in 30.000	1 in 100

Bilateral fallopian tube ectopic occur in 1 in 200.000

Symptoms
• Vaginal **bleeding**.
• **Nausea** and **vomiting**.
• Pain; **lower abdominal**, sharp abdominal, iliac fossa.
• Pain; **shoulder**, **neck**, **rectal**: → **diarrhea**.
• Pain and bleeding → **fainting**; rupture ectopic.
  ❖ Pain >
    • The onset of the pain may be **abrupt or slow**.
    • The pain may be **continuous or intermittent**.
    • The pain may be **dull or sharp**.
    • The pain may be **mild or severe**.
    • The pain is **not crampy**.

The classic signs and symptoms
• Amenorrhea.
• Abdominal pain.
• Vaginal bleeding.
• Hypotension, ± syncope.

Diagnostic Factors
❖ Common factors mainly are:
1. **Amenorrhoea**.
2. abdominal **pain**.
3. vaginal **bleeding**.
4. **abdominal tenderness**.
5. **adnexal tenderness** or **mass**.
6. **blood** in vaginal vault.

❖ Uncommon factors mainly are:
1. **haemodynamic instability**, **orthostatic hypotension**.
2. **cervical motion tenderness**.
3. **urge to defecate**.
4. referred **shoulder pain**.

Bleeding
-dissect into the lumen → endometrium → spotting.
-**some** passes into the **peritoneal cavity**.
-**most trapped between the serosal and mucosal layers**.

Pathophysiology

- **Effective transport** of embryos in the fallopian tube requires a **delicately regulated complex interaction between the tubal epithelium, tubal fluid, and tubal contents**. This interaction ultimately generates a **mechanical force**, composed **of tubal peristalsis, ciliary motion**, and **tubal fluid flow**, to **drive the embryo towards the uterine cavity**. This process is subject to **dysfunction** at **many different points** that can ultimately manifest as ectopic pregnancy.

1. **Damage of the tubal cilia** by **infection**, →egg **transport** becomes disrupted.
2. Formation of **pocket** like pools that **engulf** the fertilized eggs.
3. **Infection**-related **scarring** and **partial blockage** of the Fallopian tubes.
4. **Bleeding**-related **scarring** and **partial blockage** of the Fallopian tubes.

Clinical Presentation

- Acutely ruptured; **top surgical emergency**.
- Probable ectopic in a symptomatic women.
- Possible ectopic in mild symptomatic women with pregnancy of unknown location.

Diagnosis

- **History**. Using the mind judgment.
- **Physical examination**.
- **Ultrasound** evaluation; but often the findings are not conclusive.
- **Blood tests**; **serial β-hCG** levels in maternal serum, **CBC**.

Diagnosis/1

- **Equivocal ultrasound** results should be combined with quantitative **beta hCG levels.**
- **Diagnostic uterine curettage** presence or absence of intrauterine chorionic villi; The presence of chorionic villi confirms a failed intrauterine pregnancy
- **Clinical judgment**; If a patient has a beta hCG level of 1,500 mIU/mL or greater, but the transvaginal US does not show an IUS, ectopic pregnancy should be suspected.
- **Laparoscopic Role**

❖ The **Discriminatory Zone**>

- The **range of β-hCG** values in which the **ultrasound** image can first **detect the sign of intra uterine pregnancy.**
- Most centers quote a range of **1500** to **3510** mIU/ml AS the DZ.

Diagnosis/2

*Clinical examinations are not diagnostic.

* Up to **30**% of patients with ectopic pregnancies have **NO vaginal bleeding**.

* About **10**% have a **palpable adnexal mass**.

* Up to **10**% have **negative pelvic examinations**.

* No combination of physical examination findings can reliably exclude ectopic pregnancy.

* Combined transvaginal ultrasonography and serial quantitative beta-hCG measurements are approximately 96 percent sensitive and 97 percent specific for diagnosing ectopic pregnancy.

* **Transvaginal ultrasonography** followed **by quantitative beta-hCG** testing is the **optimal and most cost-effective** strategy for **diagnosing** ectopic pregnancy.

Diagnostic approach

- Step one: **Confirm pregnancy** and **ectopic pregnancy symptoms**
- Step two: Evaluate hemodynamic **stability**
- Step three: Assess pregnancy **location**
- Step four: Follow with **hCG** and **ultrasound** to confirm or exclude ectopic pregnancy
- Step five: **plan** of management

Signs of a **ruptured** fallopian tube ectopic

- **Sudden, severe, sharp pain**.
- Feeling **faint** and **dizzy**.
- Feeling or being **sick**.
- **Diarrhea**.
- **Shoulder tip pain**.
- The dangerous of rupturing the **large artery** runs on the outside of each Fallopian tube.

Differential Diagnosis

1. Appendicitis.
2. Salpingitis.
3. Urinary tract disease.
4. Spontaneous abortion or threatened abortion.
5. Ovarian torsion.
6. Ruptured corpus luteum cyst or ovarian follicle.

✓**Only 50%** of patients with an ectopic pregnancy present with **the classic triad of amenorrhea, pain, and vaginal bleeding**.

✓A study by (**Huchon et al**) found that the following 4 symptoms independently contributed to the diagnosis of **tubal rupture**:

a. **Vomiting** during pain.
b. **Diffuse** abdominal pain.
c. **Acute** pain for **> 30** minutes.
d. **Flashing** pain.

> The sensitivity was **93%** in the presence of **1 or more** of these items.

Treatment Options

- **Observation**; resolve on their own without the need for any intervention.
- **Laparoscopy**; for diagnosis and management.
- **Laparotomy**; *urgent* surgery due to life-threatening bleeding.
- **Medication**; under certain circumstances.

Expectant Management
• General health appears to be **stable**.
• Pain levels are considered to be **acceptable**.
• An ultrasound scan shows a **small** ectopic pregnancy with **no worrying bleeding** into the abdomen.
• Initial β-hCG titers **< 200** mIU/mL.?? 1000 mIU/mL.
• The level of β-hCG titers **decreasing.**
• Able and welling to **comply** with close fellow up.
• The **lady prefer** expectant management than methotrexate therapy.

Emergency surgery
• Hemodynamically **unstable**.
• Signs or symptoms of impending or ongoing **rupture** of ectopic.
• Indications for a concurrent surgical procedure, which may include:
(1) Desire for sterilization.
(2) Planned IVF for future pregnancy with known hydrosalpinx.
• **Heterotopic** pregnancy with coexisting viable intrauterine pregnancy.
• **Contraindications** to MTX therapy.
• **Failed** MTX therapy.

Surgery: Laparotomy vs. Laparoscopy
(Applied for both options: **salpingectomy** or **salpingostomy**)
• If suspicion that the fallopian tube has **ruptured**, **emergency** surgery.
• If the fallopian tube has **not ruptured**, **laparoscopic** surgery may be all that is needed to remove the embryo and repair the damage.
• **Salpingostomy** is **preferred** because it is a **conservative** surgical option.

Medical
Methotrexate
- Antimetabolite chemotherapeutic agent that binds to the enzyme dihydrofolate reductase, which is involved in the synthesis of purine nucleotides. This interferes with deoxyribonucleic acid (DNA) synthesis and disrupts cell multiplication.
- Treatment with methotrexate is an attractive option when the pregnancy is located on the **cervix** or **ovary** or in the **interstitial** or the **cornual** portion of the tube or the **scar** of cesarean section.

Establishing the diagnosis 1/3
By one of the following criteria:
- **Abnormal doubling rate** of the (**β-hCG**) level less than 5000 & **USS** identification of a **GS outside** of the uterus.
- **Abnormal doubling rate** of the β-hCG level, an **empty** uterus, and menstrual aspiration with **no chorionic villi**.

Establishing the diagnosis 2/3
- The patient must be haemodynamically **stable**, with no signs or symptoms of **active bleeding** or **haemoperitoneum**.
- The patient must be **reliable**, **compliant**, and able to **return for follow-up** care.
- The **size of the GS** should not exceed **4cm** at its **greatest** dimension.

Establishing the diagnosis 3/3
- **Absence of fetal cardiac activity on USS findings** - The presence of fetal cardiac activity is a **relative** contraindication.
- **No evidence of tubal rupture** - Evidence of tubal rupture is an **absolute** contraindication.
- **β-hCG level less than 5000** mIU/mL - Higher levels are a relative contraindication.
- **Evidence of hepatic or renal compromise** is a contraindication to methotrexate therapy.

Contraindications to Medical Therapy
(1) A β-hCG level of **> 5,000** mIU/mL.
(2) **Evidence of tubal rupture**
(3) **Fetal cardiac activity**.
(4) **Free fluid** in the cul-de-sac.
(5) **Evidence of hepatic or renal compromise.**

"There is an inverse association between βhCG levels and successful medical management of an ectopic pregnancy".

Adverse Drug Effects
• Nausea • Vomiting • Stomatitis • Gastric distress
• Diarrhea • Dizziness.

Treatment Effects
(1) An **increase in abdominal pain** (occurring in up to two thirds of patients)> *Increased abdominal pain is believed to be caused by the separation of the pregnancy from the implanted site.*
(2) An **increase in β-HCG** levels during the first 1-3 days of treatment.
(3) Vaginal **bleeding** or **spotting**.

Day 1
(1) Level of β-hCG.
(2) CBC.
(3) Liver function.
(4) kidney function tests.
(5) Blood type, Rh status

Methotrexate (50 mg/m2) is administered **by IM injection.**
Advise patients not to take vitamins with folic acid until complete resolution of the ectopic pregnancy.

Day 4
• The patient returns for **measurement** of her **βhCG** level.
• The level **may be higher** than the pretreatment level.
• The **day-4 hCG** level is the **baseline level against which subsequent levels** are measured.

Day 7

• Draw **β-hCG curve**, perform a **CBC**.
• If the β-hCG level has **dropped 15% or more** since day 4, obtain **weekly** β-hCG levels until they have reached the negative level for the lab.
• If the weekly levels **plateau or increase**, a **second** course of methotrexate may be administered.
• If the β-hCG level has **not dropped at least 15%** from the day-4 level →Administer a **second IM dose of methotrexate** (50 mg/m2) on **day 7**.
• Observe the patient similarly.
• If no drop has occurred by **day 14**, **surgical** therapy is indicated.
• If the patient develops **increasing abdominal pain** **after methotrexate therapy**, repeat a transvaginal ultrasonographic scan **(TVUS) to evaluate for possible rupture**.

Conception/ Recurrence

• Approximately **30%** of women treated for ectopic pregnancy later have **difficulty** conceiving.
• The overall conception rate is approximately **75%** regardless of treatment.
• Rates of **recurrent** ectopic pregnancy are between **(5-20)%**.
• The risk increases to **30%** in women who have had **two consecutive ectopic pregnancies**.

Ectopic Pregnancy Facts

• An ectopic pregnancy is a **pregnancy located outside the inner lining of the uterus**.
• Risk factors for ectopic pregnancy include **previous** ectopic pregnancies and conditions (**surgery, infection**) that disrupt the normal anatomy of the Fallopian tubes.
• Hormonal imbalances or abnormal development of the fertilized egg also might play a role.
• An ectopic pregnancy can't proceed normally. The fertilized egg can't survive.
• Early treatment of an ectopic pregnancy can help preserve the chance for future healthy pregnancies.
• The major health risk of an ectopic pregnancy is **internal bleeding.**
• Diagnosis of ectopic pregnancy is usually established by proper **history**, **physical** exam, **blood hormone** tests, pelvic **ultrasound**, and on top thinking of it.
• Treatment options for ectopic pregnancy include **conservative** approach, **surgery** and **medical**.
• Obviously, the clinical challenge is to avoid tubal rupture by making a correct and timely diagnosis, thereby optimizing fertility prospects.
• There is no difference in the reproductive outcome after treatment of EP by laparotomy versus laparoscopy. Salpingostomy is associated with higher subsequent IUP and recurrent EP rates compared with salpingectomy.
• Methotrexate is a viable alternative to laparoscopic salpingostomy for a selected group of patients.
• **All** Rh-negative, unsensitized women who have EP should receive **anti-D immunoglobulin**.
• **Avoid pregnancy** for at least **3 months** to permit the tube normalize and the methotrexate completely eliminated.

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