



ORIGINAL RESEARCH PAPER

Health Care

A REVIEW ON RECENT TRENDS IN THE TRATMENT OF ECTOPIC PREGNANCY

KEY WORDS:

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A Review on recent trends on ectopic pregnancy

ECTOPIC PREGNANCY

Definition

Ectopic pregnancy is an implantation of a fertilized ovum outside the uterine endometrial cavity.

Commonest site: Fallopian tube (>95%)

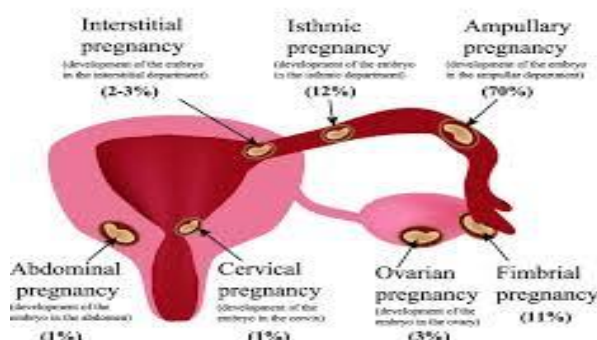
Incidence & Importance :Incidence: 1–2% of all pregnancies (1) It is the leading cause of first-trimester maternal mortality which is rising due toARTand PID.The best diagnostic tool will be TVS + B-hCG.

Sites of Ectopic Pregnancy

Tubal (95–98%)

- Ampullary – 70%
- Isthmic – 12%

Types of ectopic pregnancy



- Fimbrial – 11%
- Interstitial– 2–4% (dangerous)

Nontubal (Rare but important) site is out side uterus

- Ovarian
- Cervical
- Caesarean scar Abdominal(primary,secondary)
- Intraligamentary
- Rudimentary horn(cornual)

Risk Factors: in our cases we have seen ampullary and isthmic ,fimbrial part of tube are site of ectpic.Many of the tubal abortions are from fimbrial ectopics. Tubal ruptures from either isthmic or ampullary regeons . some of the cervical ectopics were after ivf pregnancies following ovulation induction. Ovarian ectopics were seen among iucd users more with mirenal.Abdomnal pregnancies were rare(<1%).Few cases of ectopic pregnancies were seen in rudimentary horn uterus(communicating to uterus).

Major risk factors are Previous ectopic pregnancy, Tubal surgery / sterilization failure, PID (Chlamydia),ART / Ovulation induction and IUCD in situ(2).

Other less common risk factors areSmoking,Endometriosis, Congenital tubal anomalies and Previous pelvic surgery in 30–40% of cases there will be no identifiable risk factor

The case fatality rate has decreased over recent years, suggesting that early diagnosis and treatment may have made an impact(2).

Pathophysiology : Based on Williams Obstetrics (26th Ed.) and RCOG guidelines, ectopic pregnancy pathology results from impaired ovum transport, with approximately 95% of implantations occurring in the fallopian tube, most frequently the ampulla. The trophoblast invades the tubal wall, leading to distension, rupture, and severe hemorrhage, often linked to previous infection or tubal damage (3).

ectopic pregnancies

Discriminatory Zone: If the serum β -hCG level is above a certain threshold (typically 1,500–3,500 mIU/mL) and no intrauterine pregnancy (IUP) is visible on a transvaginal ultrasound, an ectopic pregnancy is highly suspected.

Abnormal Trends: In a healthy pregnancy, hCG levels usually double every 48–72 hours. A rise of less than 35–53% over 48 hours or a plateauing level often points to an ectopic pregnancy or a failing IUP.

Clinical Features

Classical Triad (only 50%)

classic triad"

- **Clinical Presentation:** The "classic triad" includes **amenorrhoea** (missed period), **vaginal bleeding**, and **abdominal/pelvic pain** (often on one side), though only about 50% of patients show all three
- An empty uterus in a pregnant patient, presence of an adnexal mass (often called the "blob" or "bagel" sign), and echogenic free fluid in the pelvis, which may indicate internal bleeding.

The most common symptoms (4) are 1. Amenorrhea, 2. Abdominal pain, and vaginal bleeding On clinical examination the important symptoms are Lower abdominal / pelvic pain,Shoulder tip pain (hemoperitoneum) Giddiness and syncope (rupture),Signs can be elicited are ,Abdominal tenderness, guarding ,Cervical motion tenderness,Adnexal mass and Signs of shock (ruptured ectopic)

Diagnostic Evaluation

1. Urine Pregnancy Test

- Positive (almost always)

2. Serum B-hCG

- Abnormal rise:
- in normalNormal IUP: doubles every 48 hrs
- Ectopic: suboptimal rise / plateau

Discriminatory zone:

- B-hCG 1500–2000 IU/L
- No intrauterine sac on TVS suspect ectopic

3. Transvaginal Ultrasound (TVS) stands as a key tool for diagnosis of ectopic pregnancy.

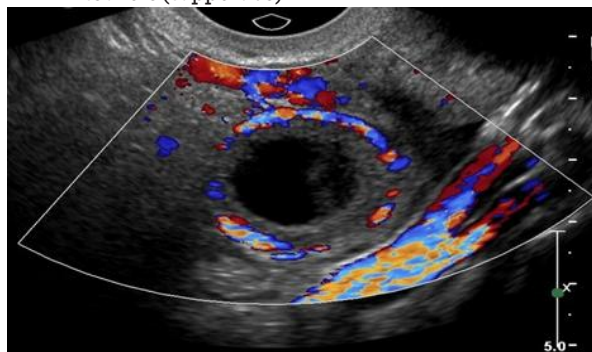
Findings such as

- Empty uterus
- Adnexal mass / tubal ring "Ring of fire"
- Free fluid in POD
- Pseudo gestational sac (central, no double decidual sign)

4. Serum Progesterone is not routinely performed

investigation to confirm the diagnosis but to be used to differentiate from other similar clinical situations

- <5 ng/mL nonviable pregnancy
- Limited role (supportive)



"Ring of fire" on tvs scan

Differential Diagnosis

- Threatened abortion
- Corpus luteum cyst
- Ovarian torsion
- Acute appendicitis
- PID

Management (5): For clinical management we Depend on the following factors such as

- Hemodynamic status
- B-hCG level
- Size & site
- Desire for future fertility

The criteria for Expectant Management are as follows :

Criteria:

- Asymptomatic
- B-hCG < 1000 IU/L and falling
- No adnexal mass / minimal
- Reliable follow-up

Contraindication: presence of pain, bleeding pv and the clinical situation is monitored by

- Serial -hCG until negative

B. Medical Management-

Methotrexate is the important single drug used many times unless there are side effects (toxicity)

Indications

- Hemodynamically stable
- Unruptured ectopic
- B-hCG < 5000 IU/L
- Mass < 3.5-4 cm
- No fetal cardiac activity
- Normal LFT, RFT, blood counts

Regimens

Single-dose

- Methotrexate 50 mg/m² IM
- Check B-hCG on Day 4 & 7
- ≥15% fall B success

Multi-dose : results good with 2 doses treatment

- MTX + Leucovorin
- More than 2 doses Higher efficacy, more side effects

Contraindications to MTX

- Rupture / shock
- Breastfeeding
- Liver / renal disease
- Blood dyscrasias
- Active pulmonary disease
- Immunodeficiency

Toxic effects (MTX):

- **Hepatotoxicity (Liver Damage):** MTX can cause elevated liver enzymes, fatty liver, and, with long-term use, liver fibrosis or cirrhosis
- **Nephrotoxicity (Kidney Damage):** Because the kidneys remove over 90% of MTX, any impairment leads to drug accumulation, worsening all other toxicities.
- It can cause acute kidney injury, often marked by decreased urination or swelling.
- **Pulmonary:** Though less common, MTX can trigger interstitial pneumonitis or pulmonary fibrosis, presenting as a persistent dry cough and shortness of breath.
PubMed Central (PMC) (.gov) +11
- **Gastrointestinal:** Nausea, vomiting, diarrhea, and stomach pain are the most frequent minor adverse effects.
- **Neurological ("MTX Fog"):** Patients often report headaches, dizziness, fatigue, and difficulty concentrating, sometimes occurring a day after their weekly dose. Mayo Clinic +4

Risk Factors for Toxicity

- **Dosing Errors:** Accidental daily ingestion of doses intended to be taken once weekly is a leading cause of acute poisoning.
- **Drug Interactions:** Medications like NSAIDs (ibuprofen, naproxen), certain antibiotics (trimethoprim-sulfamethoxazole), and proton pump inhibitors can increase MTX levels by slowing its clearance.
- **Medical Conditions:** Advanced age, chronic kidney disease, and alcohol use significantly heighten the risk of severe reactions.

Management & Prevention

- **Antidotes:** Folinic acid (Leucovorin) is the primary antidote used to "rescue" cells by bypassing the blockade caused by MTX. Glucarpidase may be used in severe cases with renal failure to rapidly clear MTX from the blood.
- **Routine Monitoring:** Regular blood tests (CBC, liver function, and renal function) are required every 4 to 12 weeks to catch early signs of toxicity.
- **Prevention Tips:** Always take daily folic acid supplements as prescribed to reduce GI and mouth sore risks. Ensure you stay hydrated and strictly avoid alcohol.

Glucarpidase

- Used in severe methotrexate toxicity, especially when there is renal failure and delayed methotrexate clearance.
- Rapidly breaks down methotrexate into inactive metabolites.

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The standard recommended dose of glucarpidase (Voraxaze) for both adults and pediatric patients is 50 Units per kilogram (Units/kg) of body weight, administered as a single intravenous (IV) bolus injection over 5 minutes. Glucarpidase is indicated to treat toxic plasma methotrexate (MTX) concentrations exceeding 1 micromole per litre (M) in patients experiencing delayed clearance due to impaired kidney function.

Medscape Reference +2

Preparation and Reconstitution

- **Vial Strength:** Supplied as a lyophilized powder containing 1,000 Units per single-dose vial.
- **Reconstitution:** Dissolve the contents of each vial with 1 mL of sterile 0.9% Sodium Chloride Injection, USP.
- **Mixing:** Roll and tilt the vial gently to mix. Do not shake.
- **Final Concentration:** The final reconstituted solution yields a concentration of 1,000 Units/mL.
- **Inspection:** Ensure the solution is clear, colorless, and completely free of particulate matter before drawing it into the syringe.
- **Timing:** Use the reconstituted solution immediately. If immediate use is not possible, store under refrigeration at 2°C to 8°C (36°F to 46°F) for up to 4 hours. Do not freeze.

Medscape Reference +3

Administration Protocol

- **Delivery:** Administer intravenously as a slow bolus over exactly 5 minutes.
- **Line Flushing:** Flush the IV line with normal saline immediately before and immediately after administering the dose to ensure complete drug delivery.
- **No Dilution:** Do not further dilute the reconstituted solution after withdrawing it from the vial.

Medscape Reference +4

Critical Therapeutic Interactions

- **Leucovorin/Folinic Acid Splitting:** Leucovorin is a competitive substrate for glucarpidase. Glucarpidase will actively cleave and inactivate leucovorin if they are present in the bloodstream simultaneously. Do not administer leucovorin within 2 hours before or 2 hours after a glucarpidase dose.
European Medicines Agency (EMA) +3
- **Leucovorin Resumption:** Resume leucovorin rescue exactly 2 hours after glucarpidase administration. For the first 48 hours post-glucarpidase, match the exact

leucovorin dosage that was being administered prior to the glucarpidase intervention.

National Institutes of Health (.gov) +1

- **MTX Monitoring Window:** For 48 hours following a glucarpidase dose, standard immunoassays will falsely overestimate plasma MTX levels due to interference from its inactive metabolite, DAMPA. Use a chromatographic method (such as HPLC) to accurately measure active plasma MTX during this 48-hour window.
National Institutes of Health (.gov) +1

Dosing Modifications

- **Renal and Hepatic Impairment:** No dosage adjustments are required for patients with renal or hepatic impairment. Glucarpidase clears toxic MTX independently of native kidney function.
Drugs.com +1
- **Repeat Dosing:** The vast majority of clinical scenarios require only a single dose. Redosing is generally not recommended due to reduced efficacy or lack of additional benefit, though a second dose is occasionally given under strict investigational protocols if verified HPLC MTX levels remain above 1 M after 48 hours.
National Institutes of Health (.gov) +3

Supportive measures

- Aggressive IV hydration.
- Urinary alkalinization with sodium bicarbonate (target urine pH >7).
- Monitoring methotrexate levels, renal function, CBC, and liver function
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Other medications used to treat ectopic pregnancy are PGF2 Alpha, injection KCL into gesatinal sac, Actinomycin-D 12mg/kg body wt orally alone or with Methotrexate

Surgical Management

Laparoscopy or laparotomy are necessary if the patient is unstable, the tube has ruptured, or if they do not meet the criteria for medical management.

Indications for surgical management are as follows

- Hemodynamic instability
- Ruptured ectopic
- Failed medical management
- Heterotopic pregnancy
- Contraindication to MTX

Surgical approach for less complicated cases is laparoscopic surgery

- Laparoscopy – gold standard
- Laparotomy – unstable patient

Procedures for clinically unstable pts we have done many times salpingectomy followed by laparotomy. when the pt is stable 'un ruptured tube we have done laparoscopic salpingectomy if the other tube is normal. In some cases we saved the tube by doing salpingostomy only When we found that the other tube was already removed for previous ectopic or damaged because of PID.

- Salpingostomy – fertility preservation
- Salpingectomy – damaged tube / completed family
- Cornual resection (interstitial ectopic) followed by suturing

Special Types – Rare Ectopics

Interstitial Ectopic: we have seen 3 cases of Interstitial Ectopic. It is very dangerous type when compared to other types because of late rupture (12–16 weeks) and severe hemorrhage. Very often pt will be in shock because of late presentation. The diagnosis is by TVS usg in early weeks and

by abdominal usg in late cases beyond 12 weeks

Diagnosis: The diagnosis of an interstitial ectopic pregnancy—a rare and potentially life-threatening condition where the embryo implants in the part of the fallopian tube that crosses the uterine wall—is primarily achieved through a combination of imaging and hormone monitoring.
ISUOG +2

Primary Diagnostic Tools

- **Transvaginal Ultrasound (TVS):** This is the "gold standard" for initial diagnosis.

Classic criteria are : (Timor-Tritsch criteria)

- **Empty uterine cavity:** No evidence of a pregnancy in the normal location.
- **Eccentric gestational sac:** The sac is located high and to one side, at least 1 cm away from the lateral edge of the uterine cavity.
- **Thin myometrial mantle:** A thin layer of muscle (less than 5 mm) surrounding the gestational sac
- **The "Interstitial Line Sign":** This is a highly specific ultrasound finding—an echogenic line that runs from the endometrial cavity directly to the ectopic mass.
- **Serial B-hCG Levels:** Blood tests measuring the pregnancy hormone are used in conjunction with imaging. Levels that rise sub-optimally (less than a 50–66% increase over 48 hours) or plateau often signal an abnormal pregnancy.
ScienceDirect.com +8

Advanced Imaging for Complex Cases

In situations where standard ultrasound is inconclusive, advanced tools can help differentiate an interstitial pregnancy from other types, such as angular or cornual pregnancies:

ISUOG +2

- **3D Ultrasound:** Provides a clearer view of the uterine horns and the spatial relationship between the sac and the uterine cavity, often improving diagnostic accuracy.
- **MRI:** Offers superior soft-tissue contrast to precisely locate the implantation site and determine if it communicates with the uterine cavity.
National Institutes of Health (.gov) +5

Differential Diagnosis

It is critical to distinguish interstitial pregnancy from:

- **Angular Pregnancy:** Implantation occurs at the lateral angle of the uterine cavity (medial to the tube); these can sometimes be viable.
- **Cornual Pregnancy:** Implantation in a rudimentary horn of a malformed uterus (e.g., bicornuate or septate).
ISUOG +4

Early diagnosis is essential because the interstitial segment of the tube is highly vascularized and can expand significantly before rupturing, which often leads to catastrophic internal bleeding.

Narayana Health +2

If patient experiences any severe abdominal pain, shoulder-tip pain, or heavy vaginal bleeding that requires immediate medical attention (suggest perforation –heamoperitoneum).



Laparoscopic appearance –interstitial ectopic pregnancy

- **TVS:** empty uterus + gestational sac > 1 cm from cavity

Management:

- **Medical:** Methotrexate (early, stable)
- **Surgical:** Cornual resection / wedge resection, followed by suturing
- UAE adjunct in selected cases

Cervical Ectopic

- Painless bleeding
- "Hourglass uterus"
- Risk of massive hemorrhag
- Management: MTX ± uterine artery embolization, some times we have to inject kcl in to sac when hcg is not coming down with MTX

Caesarean Scar Pregnancy

- Implantation in previous LSCS scar
- **Risk:** uterine rupture, placenta accreta
- TVS diagnosis
- **Management:** MTX / surgical evacuation
- Use laparoscopic evacuation and scar repair

Complications

- Tubal rupture
- Hemorrhagic shock
- Recurrence (10–15%)
- Subfertility

Future Fertility & Counseling

- Recurrence risk increased
- Early TVS in next pregnancy mandatory
- Avoid pregnancy for 3 months after MTX
- Rh-negative women Anti-D

Key Pearls

- **Most common site:** Ampulla
- **Most dangerous:** Interstitial
- **Best diagnostic combo:** TVS + B-hCG
- **Gold standard treatment (stable):** Laparoscopy
- B-hCG not doubling = red flag

RARE ECTOPIC PREGNANCIES –A REVIEW

Definition

Rare ectopic pregnancies are implantations occurring outside the fallopian tube, accounting for <5% of all ectopic pregnancies, but associated with high morbidity and mortality due to late diagnosis and massive hemorrhage.

Classification of Rare Ectopics

1. Interstitial
2. Cervical
3. Caesarean Scar Pregnancy (CSP)
4. Rudimentary Horn Pregnancy
5. Heterotopic Pregnancy
6. Ovarian
7. Abdominal
8. Intraligamentary

Angular Pregnancy is not an ectopic pregnancy but it is an intra uterine pregnancy because of sac location it is to be

differentiated from interstitial ectopic pregnancy. Surrounding myometrium to sac is more than 5mm and gestational sac is medial to round ligament.

vascularity-of-the-live-cervical-ectopic-pregnancy-demonstrated-on-TV-scan.

1. Interstitial Pregnancy :

Definition

Implantation in the interstitial part of fallopian tube traversing the myometrium.

Incidence 2-4% of ectopics

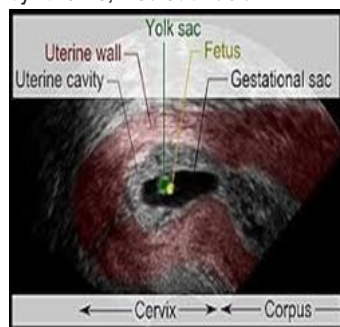
- Causes disproportionate maternal mortality
- It is dangerous as there will be thick myometrium and late rupture (8-16 weeks)
- Profuse hemorrhage due to uterine vessels rupture
- Diagnosis (TVS)
- Empty uterine cavity
- Gestational sac ≥ 1 cm from uterine cavity margin and in intramural part of the tube, lateral to round ligament.
- Interstitial line sign (echogenic line from cavity to sac) is present
- Management
- Medical: Methotrexate (early, stable)
- **Surgical:** Cornual resection / wedge resection, followed by suturing,
- UAE adjunct in selected cases

2. Cervical Pregnancy:

Definition

Implantation below internal os, within cervical canal.

Risk Factors are, Previous curettage, IVF, Asherman syndrome, Previous LSCS



Cervical ectopic pregnancy

the endometrium is damaged by a number of risk factors leading to the failure of blastocyst implantation. Studdiford postulated that rapidly transporting of a fertilized ovum through the endometrium caused a cervical implantation. Hofmann et al proposed that the endometrium is so immature for implantation

Clinical Features

- Painless vaginal bleeding
- Soft, enlarged cervix ("Hourglass uterus")

Diagnostic Criteria (Paavlidis)

- Empty uterus
- Gestational sac in cervix
- Closed internal os
- Absent sliding sign, profuse but painless vaginal bleeding and amenorrhea, (2) a soft distended cervix that is usually larger than the corpus, (3) palpable placenta in the endocervix, and (4) a closed internal cervical os.
- The most common symptom is vaginal bleeding and is painless. However it is not specific for cervical pregnancy. It must be distinguished from its mimickers like 1. cervical phase of spontaneous abortion, 2. cervical cancer, 3. cervical varicose veins, 4. placenta previa, 5. ruptured ectopic pregnancy, 6. Attempted illegal abortion, or choriocarcinoma. Lower abdominal pain or cramps occur in fewer than one-third cases.

• **Management :** Ultrasound is the primary diagnostic modality, Magnetic resonance imaging can be used as a second-line investigation if the diagnosis is equivocal. The most effective method of treatment for cervical pregnancy is yet to be found. Management options range from conservative therapies to surgical procedures. And often, more than one method is usually tried in the termination of cervical pregnancy (7).

• On speculum examination, the cervix is hyperemic, bulging and bluish discolored. In some cases, there are fetal membranes or pregnancy tissue at the external cervical os, which appear blue or purple. A cystic lesion on the cervical lip may be observed and represent trophoblastic invasion into the cervical stroma.

• The following ultrasound criteria may be used for the diagnosis of cervical pregnancy:

- (1) An empty uterus
- (2) A barrel-shaped cervix
- (3) A gestational sac present below the level of the internal os
- (4) The absence of the "sliding sign",
- (5) Blood flow around the gestational sac using colour Doppler.

Magnetic resonance imaging (MRI) can be used as a second-line investigation if the diagnosis is equivocal and there is local expertise in the MRI diagnosis of caesarean scar pregnancies. The typical MRI finding of a cervical pregnancy is a heterogeneous hemorrhagic mass with densely enhancing papillary solid components.

The main different diagnosis of cervical pregnancy is an ongoing miscarriage with a gestational sac passing through the cervix. The best way to distinguish the two situations is by the sliding sign. When gentle pressure is applied on the cervix with the probe, the implanted cervical pregnancy does not slide, unlike the gestational sac of the abortion. Furthermore, peritrophoblastic blood flow can be demonstrated on colour Doppler ultrasonography in case of cervical pregnancy. The visible fetal cardiac activity can also exclude an ongoing miscarriage. If there is any doubt as to whether a pregnancy is an ongoing miscarriage or a cervical pregnancy, repeat ultrasound required to confirm the diagnosis.

• Cervical pregnancy may be misdiagnosed as a Cesarean scar pregnancy. The difference is that cervical pregnancy is located below the internal os, while scar pregnancy is located above, at the level of the cesarean scar incision. All pregnancies implanted into the posterior cervix should be described as cervical pregnancies regardless of women's previous history of delivery by Cesarean section. In cases of anterior implantation in women who have had a caesarean in the past, the differential diagnosis includes Cesarean scar ectopic pregnancy. In terms of management, they differ very little from Cesarean scar pregnancies.

is a rare and life-threatening condition. The incidence appears to be rising, not only due to assisted reproductive technologies (1:100), but also due to better access and accuracy of transvaginal ultrasound scanning. If there is a delay in diagnosis or treatment uncontrolled vaginal bleeding may result, leading to hysterectomy or even maternal death. Early diagnosis and treatment are the key to a successful outcome. cervical pregnancy under Rubin's definitions, the following must be true:

Rubin's criteria: :Cervical ectopic pregnancy

- **Cervical Glands Opposite Attachment:** Cervical glands must be present directly opposite the site where the placenta or trophoblast is attached.
- **Low Placental Attachment:** The attachment of the placenta to the cervix must be situated below the level of the entrance of the uterine vessels or below the anterior

and posterior peritoneal reflections.

- **Empty Uterine Corpus:** Fetal elements must be entirely absent from the main body (corpus) of the uterus.
- **4th criteria:** the attachment between placenta and cervix must be intimate

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it is possible that a significant proportion of ectopic pregnancies occur as a result of embryo migration rather than poor ET technique.



Cervical ectopic pregnancy

• However, accurate and timely diagnosis of cervical pregnancy is still a challenge because it can be mostly misdiagnosed as an ongoing abortion. This rare type of ectopic pregnancy, with its associated high risk of maternal morbidity and mortality should be suspected if the patient presents with the painless vaginal bleeding and a low implantation of gestational sac, under the internal os.

• Ectopic pregnancy is still a significant source of maternal morbidity and mortality.

• Improved access to transvaginal ultrasound scanning facilities and the rapid assay of serum human chorionic gonadotropin (hCG) means that most ectopic pregnancies, including cervical pregnancies, are now diagnosed earlier. However, cervical pregnancy remains a high risk condition as it may present with a massive life-threatening hemorrhage secondary to the erosion of cervical blood vessels, and require emergency hysterectomy to minimize morbidity and mortality. Early diagnosis and management are the crucial steps for good outcome. Currently, the optimal method of treatment for cervical pregnancy is uncertain. Management options for cervical pregnancy range from conservative therapy to surgical procedures. Traditionally, cervical ectopic pregnancies have been managed surgically due to the anatomical location of cervical pregnancies. However, there has been a significant shift from such an approach to more conservative treatment modalities. Often, more than one method is employed to resolve cervical pregnancy.

• Conservative management is either medical or expectant. Medical management may be systemic or intra-amniotic methotrexate administration, with or without intra-amniotic potassium chloride. To fulfil the criteria for conservative management, women have to be pain free, hemodynamically stable, pre-treatment serum -HCG less than 5000 mIU/ml, absence of ultrasound evidence of fetal heart activity and patient's agreement.

Curettage is the age-old fertility preserving method, but risks hemorrhage. Therefore, it has been used in conjunction with mechanical methods like cervical artery ligation and tamponade. Primary hysterectomy may still be the preferred treatment modality in cases of uncontrolled hemorrhage, second trimester or third trimester diagnosis of cervical pregnancy in an attempt to avoid emergency surgery and massive blood transfusion in a woman not desirous of fertility.

- A suboptimal rise in serial human chorionic gonadotropin (β -hCG) allows to suggest the diagnosis of an ectopic pregnancy but does not help to confirm the diagnosis of a cervical pregnancy
- Management: B-hCG Levels: MTX alone is more likely to fail if levels are >10,000 mIU/mL.

- **Gestational Age:** Pregnancies beyond 9–12 weeks often require more aggressive multimodal management.
- **Cardiac Activity:** Presence of a heartbeat often prompts the addition of KCl or immediate surgical/vascular intervention.
- **Hemodynamic Stability:** Patients with active, heavy bleeding may require immediate surgery rather than a phased medical approach.

In un complicated cases multiple doses of Methotrexate with Bhcg levels guidance can be tried as local treatment into the sac or systemically.

- Uterine artery embolization
- Balloon tamponade
- Hysterectomy (uncontrolled bleeding)

The specific combination depends on several factors:

PubMed Central (PMC) (.gov) +7

3. Caesarean Scar Pregnancy (CSP) (11): The reported incidence of CSEP ranges from 1 in 1800 to 1 in 2200 pregnancies, although these figures are likely underestimates due to misdiagnosis and underreporting. The first ultrasound-based diagnosis of CSEP was described by Rempen and Albert in 1990.

Definition

Implantation in fibrous tissue of previous LSCS scar.

Incidence

Increasing with rising CS rates

Types

- Type I (Endogenic) – grows into uterine cavity
- Type II (Exogenic) – grows towards bladder rupture

TVS Criteria

- Empty uterine cavity & cervical canal
- Sac in anterior lower uterine segment
- Thin / absent myometrium between sac & bladder
- Increased peri-trophoblastic flow (Doppler)
- Negative sliding sign

Complications

- Uterine rupture
- Morbidly adherent placenta
- Catastrophic hemorrhage



Caesarean Scar Pregnancy (CSP)

Management:

- Methotrexate (systemic / local) if Bhcg is low
 - UAE+Suction evacuation (If pregnancy is very much vascular)
 - Surgical excision of scar by laparoscopy or laparotomy
- Hysteroscopic removal of products of conception if the pregnancy grows more towards uterine cavity

4. Ovarian Pregnancy(13)

Incidence : 0.5–3% of ectopics.

The Diagnostic Criteria (Spiegelberg) are as follows

1. Gestational sac in ovary
2. Attached to uterus via ovarian ligament



Three-dimensional volume ultrasound of the left ovary: a small mass compatible with 'bagel' appearance bulging from the cortex and co-existing with two additional masses is noted. CL, corpus luteum; ES, ectopic sac.

Ovarian Pregnancy

This can be Differentiated from Corpus luteum cyst

Management : conservative method when B hcg is <1000iu with MTX

Surgery: Ovarian ectopic pregnancy is rare and can be associated with high morbidity and adverse consequences for future fertility. Usually surgical treatment in the form of oophorectomy or wedge resection of the ovary is required(10).

5. Abdominal Pregnancy (12) :

Definition

Implantation in peritoneal cavity, outside uterus, tubes, ovaries.

Types

- Primary – direct implantation
- Secondary – reimplantation after tubal rupture

Common Sites are Pouch of Douglas, Omentum, Bowel, liver, and spleen. There have been several theories to explain how an abdominal pregnancy occurs. The fertilization may occur posterior to the uterus where sperm is known to accumulate, and an egg might be found there as a result of the dependent flow of peritoneal fluid. Others hypothesized that the abdominal pregnancy would occur because of migration of the embryo from the female reproductive tract to the peritoneal cavity by travelling along lymphatic channels.



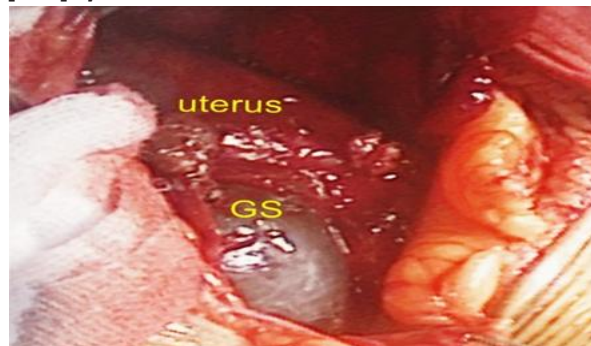
. Abdominal ectopic Pregnancy

Diagnosis :Some women may present with gastrointestinal symptoms (e.g. nausea and vomiting), so the suspected clinical diagnosis might be gastroenteritis rather than ectopic pregnancy.

- Amenorrhea, sub optimal rise of B hcg, abnormal fetal lie, Painful fetal movements, Empty uterus on TVS.
- MRI helpful
- Transvaginal ultrasound examination cannot determine a pregnancy, a thorough transabdominal ultrasound examination must be done to look for the rarer locations. If the location of the pregnancy is still uncertain, a MRI scan

can help to confirm the diagnosis of an abdominal pregnancy and severe internal bleeding, when not detected by USG.

As the ectopic pregnancy grows, the placenta (the organ that nourishes the foetus) can attach to blood vessels in the abdomen. If the placenta ruptures, it can cause significant blood loss, which can be life-threatening if not treated promptly.



Infection: A ruptured ectopic pregnancy can also lead to infection in the abdomen, which requires prompt treatment with antibiotics.

- **Damage to Organs**: The growing ectopic pregnancy can press on or damage nearby organs in the abdomen, causing pain and other complications.
- **Infertility**: During Surgery of the ectopic pregnancy we may accidentally injure or remove a fallopian tube, which can affect fertility. However, the other fallopian tube remains healthy in many cases and allows for future pregnancy

. Mortality Rate: Compared to other types of

ectopic pregnancies, abdominal pregnancies carry an overall 5% risk of complications and death for the mother. Studies suggest that the mortality rates for abdominal ectopic pregnancy are 7.7 times higher than tubal ectopic pregnancies and 90 times higher than that of a normal pregnancy

"Study for criteria" for Abdominal Ectopic Pregnancy :

- **No Uteroperitoneal Fistula**: There must be no abnormal opening or connection between the uterus and the peritoneal cavity.
- **Exclusive Peritoneal Attachment**: The pregnancy must be attached solely to a peritoneal surface (such as the bowel, omentum, or pelvic wall).
- **Early Diagnosis**: The pregnancy must be detected early enough in gestation to rule out the possibility that it began in the tube and only became abdominal later (secondary implantation).

A Rare Case of Secondary Abdominal Pregnancy with Placental Implantation between Leaves of Broad Ligament



Secondary Abdominal Ectopic Pregnancy

Abdominal ectopic pregnancies are a medical emergency and require prompt treatment to prevent serious complications. There are three main treatment options, and the best course of action will depend on various factors:

Surgical Treatment:

Laparotomy (open abdominal surgery) to remove the Abdominal ectopic Pregnancy is the most common treatment approach

Laparoscopic surgery (minimally invasive "keyhole" surgery)

can be used in early-stage abdominal pregnancies (<12 weeks) or if the implantation site allows for non-haemorrhagic removal

A multidisciplinary surgical team may be required due to the high risk of haemorrhage and the need to manage potential complications

Medical Treatment:

Methotrexate injections to stop the pregnancy from developing further, allowing it to be reabsorbed by the body

Methotrexate is most effective in early ectopic pregnancies with low hCG levels (<5000 mIU/mL)

Careful monitoring of hCG levels is required with medical management

Other Treatments:

Image-guided vessel embolisation to control bleeding from the implantation site

Direct injection of potassium chloride into the ectopic pregnancy

Abdominal ectopic pregnancy

6. Intraligamentary Pregnancy(secondary intra abdominal ectopic)

Definition :

Implantation between leaves of broad ligament.

Pathogenesis : Secondary implantation after tubal rupture.

Diagnosis : It is difficult to diagnose, Often diagnosed during surgery, and Surgical removal of ectopic.

Management: Surgical removal is the best after Careful dissection to avoid ureter & vessels

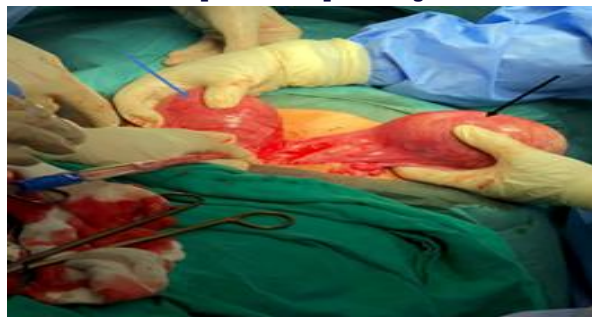
7. Rudimentary Horn Pregnancy(cornual) (14)

Definition : a true cornual pregnancy specifically is one occurring in a rudimentary horn of an anomalous uterus (like a bicornuate or septate uterus).

Cornual rudimentary horn ectopic pregnancy is a rare, life-threatening Mullerian anomaly (1:76,000–150,000 pregnancies) where implantation occurs in a non-communicating horn.

ISUOG +1

Mechanism: Transperitoneal sperm migration



Features : There will be Late rupture of uterus(12–20 weeks) and Massive hemorrhage.

Diagnosis:

ultrasound criteria for diagnosis of cornual pregnancy were met: (1) a single interstitial portion of Fallopian tube in the main uterine body; (2) a gestational sac, mobile and separate from the uterus, surrounded by myometrium; and (3) a vascular pedicle joining the gestational sac to the

unicornuate uterus

Pseudo-bicornuate appearance by TVS / 3D usg/MRI

Management: laparotomy and early excision of rudimentary horn with tube and emergency laparotomy if ruptured

Rupture usually occurs in the second trimester (80–90% cases), necessitating urgent surgical intervention
National Institutes of Health (.gov) +4

Rudimentary Horn Pregnancy(cornual) Rt side



8 Rudimentary Horn Pregnancy(cornual) Rt side

8. Heterotopic Pregnancy. Heterotopic Pregnancy Definition

Simultaneous intrauterine + ectopic pregnancy.

Incidence: : 1:30,000 pregnancies and with ART up to 1%

Diagnosis by TVS

- Pain despite confirmed intrauterine pregnancy is the main Clue.

Heterotopic Pregnancy



Symptoms

- **Abdominal Pain:** The most frequent symptom, reported in over 80% of cases.
- **Vaginal Bleeding:** Occurs in about half of cases.
- **Adnexal Mass/Tenderness:** A mass near the ovary or uterus.
- **Peritoneal Irritation/Shock:** Symptoms of an ectopic pregnancy rupture, which can be life-threatening.
- 50% asymptomatic initially

Management: we have to preserve intrauterine pregnancy and there by surgical removal of ectopic. MTX is contraindicated in this pregnancy.

Complications of Rare Ectopics

- Massive hemorrhage
- Uterine rupture
- Need for hysterectomy
- Loss of fertility
- Maternal death

We have seen and managed even twin sacs, molar ectopics in

ampullary part of tube and even post hysterectomy ectopic pregnancy which was confirmed by histo pathology.

Key points:

- **Most lethal ectopic:** Interstitial
- **Painless bleeding:** Cervical ectopic
- **Rising incidence:** CS scar pregnancy (due to increased caesarian sections)
- **IVF association:** Heterotopic pregnancy (1:100)
- **platau b hcg levels and Placenta left in situ:** Abdominal pregnancy

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