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A Review Article On Hepatic Pregnancy: A Rare And Life-Threatening Form Of Ectopic Gestation

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1. ABSTRACT:

An extremely uncommon and severe type of abdominal ectopic pregnancy is called hepatic pregnancy, in which the embryo implants and grows on the liver's surface or inside its parenchyma. With fewer than 100 cases documented in the literature globally, hepatic pregnancies make up a very small percentage of all abdominal pregnancies and represent one of the rarest implantation sites in ectopic gestation. Due to the condition's uncommon clinical appearance and rarity, early identification is extremely challenging, frequently leading to delayed recognition and treatment, which can have potentially fatal outcomes for the mother.

Nonspecific symptoms such right upper quadrant stomach pain, shoulder tip pain, gastrointestinal discomfort, nausea, or indications of internal bleeding—especially in situations of rupture—may be present in patients with hepatic pregnancy. These symptoms are frequently deceptive and do not immediately trigger suspicion of ectopic gestation, in contrast to tubal ectopic pregnancies. Furthermore, because of the liver's abundant arterial supply, hepatic pregnancies may progress farther into gestation than other ectopic kinds, raising the possibility of catastrophic hemorrhage.

Imaging modalities have a major role in diagnosis. Hepatic implantation sites are frequently overlooked because of their location, even though transvaginal ultrasonography is still the first-line method for assessing suspected ectopic pregnancies. Doppler tests, abdominal ultrasonography, and particularly computed tomography (CT) and magnetic resonance imaging (MRI) scans are essential for pinpointing the precise location of implantation and assessing the degree of placental invasion into hepatic tissue.

Hepatic pregnancy management is quite complicated and unique to each patient. Frequently, surgery is required, which may involve a laparotomy in which the gestational tissue is removed. Hepatic resection, hepatic vascular ligation, or preoperative embolization may be necessary in some circumstances to stop bleeding. In certain situations, either as a supplement to surgery or in situations where surgery has significant

dangers, the chemotherapeutic drug methotrexate has been used to cause trophoblastic regression. However, a multidisciplinary team of obstetricians, general surgeons, hepatobiliary specialists, and interventional radiologists must carefully arrange treatment techniques.
Hepatic pregnancy still carries a high risk of maternal morbidity and death, even with improvements in surgical and diagnostic imaging methods. Improving results requires prompt diagnosis, careful preoperative planning, and all-encompassing supportive care.

KEY WORDS: Hepatic Pregnancy, Ectopic Pregnancy, Abdominal Pregnancy

Primary Hepatic Ectopic Pregnancy, Liver Implantation, Maternal Morbidity Hemorrhage, Ultrasound

2. INTRODUCTION:

A major source of maternal morbidity and mortality, particularly during the first trimester, is ectopic pregnancy, which is defined as the implantation of a fertilized ovum outside the uterine cavity. Rare instances of abdominal implantation have been reported, while the fallopian tube is the most frequently affected region of ectopic implantation. With less than 100 cases documented worldwide, hepatic pregnancy—a type of primary abdominal pregnancy in which the gestational sac implants on the liver—is one of the rarest and most deadly of these.

Primary abdominal pregnancies, which happen when the fertilized ovum implants directly onto an abdominal organ without any antecedent tubal involvement, are the category under which hepatic pregnancy falls. When such pregnancies end, the liver, an extremely vascular organ, is especially vulnerable to severe intraperitoneal hemorrhage. With a significant risk of complications such as hemorrhagic shock, disseminated intravascular coagulation (DIC), hepatic rupture, and mortality, hepatic pregnancies are therefore a major threat to the life of the mother.
Delays in diagnosis result from the highly diverse and frequently cryptic clinical presentation of hepatic pregnancy. Depending on the degree of hepatic involvement or rupture, common symptoms may include referred shoulder pain, abdominal distension, gastrointestinal difficulties, or pain in the right upper quadrant. There is a greater chance of serious maternal morbidity when the pregnancy progresses to the second or third trimester before being detected.

Hepatic pregnancy is still difficult to diagnose clinically and radiologically. Despite being readily accessible, ultrasound's limited ability to visualize upper abdominal tissues may make it difficult to detect hepatic implantation. Accurate localization and surgical planning frequently require the use of sophisticated imaging methods, such as contrast-enhanced CT or MRI. Since the treatment of hepatic pregnancy is very different from that of other ectopic pregnancies, an early and precise diagnosis is essential.

Obstetricians, general or hepatobiliary surgeons, anesthetists, and interventional radiologists must all be involved in the multidisciplinary treatment process. In order to stop hepatic hemorrhage, surgical excision of the gestational tissue is typically necessary. To reduce the risk of bleeding or chronic trophoblastic illness, preoperative embolization or postoperative methotrexate therapy may be used in some situations.

Clinicians must maintain a high index of suspicion in women of reproductive age who present with abdominal pain and a positive pregnancy test, especially after intrauterine or tubal pregnancy has been ruled out, because hepatic pregnancy is uncommon and can have disastrous consequences. In order to increase awareness and enhance maternal outcomes in these uncommon and complicated instances, this study reviews hepatic pregnancy, covering its etiology, clinical characteristics, diagnostic difficulties, and therapy approaches.

3. TYPES OF PREGNANCY:

Usually, the location of the fertilized ovum's implantation determines the classification of pregnancy. Ectopic pregnancies entail implantation outside the endometrial lining, whereas normal implantation takes place inside the uterine cavity. A quick review of the main types of pregnancy is necessary to comprehend the classification of hepatic pregnancy, an uncommon and severe variation of ectopic pregnancy.

1. Pregnancy within the womb (IUP)

This is the typical kind of pregnancy in which the embryo implants inside the uterine endometrial lining. It consists of:

- A single gestation or several
- Forms that are normal or pathological (like molar pregnancy)

2. Unplanned Pregnancy

Any pregnancy in which the embryo implants outside the uterus is referred to here. About 1% to 2% of pregnancies are ectopic, and they are categorized according to the location of implantation:

A. Ectopic Pregnancy in the Tubal

- The most prevalent kind (more than 90% of ectopic pregnancies)
- The fallopian tube is where implantation takes place (ampulla, isthmus, infundibulum, or fimbriae).

B. Ectopic Pregnancy Without Tubal

Although less frequent, the risk of catastrophic hemorrhage and delayed detection make it frequently more dangerous. Contains:

1. Pregnancy in the Ovaries

- On or inside the ovary, implantation takes place.

2.Cervical Pregnancy

- The cervical canal is where implantation takes place.

3. Interstitial or cornual pregnancy

- The interstitial section of the fallopian tube, which is located inside the uterine wall, is where implantation takes place.

4. Pregnancy in the abdomen

- Outside of the reproductive organs, in the peritoneal cavity, implantation takes place.

3. Pregnancy in the Abdomen (Associated with Hepatic Pregnancy)

One percent of all ectopic pregnancies are abdominal pregnancies, which are classified as follows:

- Primary abdominal pregnancy: The fertilized ovum does not first connect to the ovary or fallopian tube; instead, it implants directly on an abdominal or peritoneal organ.
- When a tubal or ovarian pregnancy ruptures or ends, the conceptus reimplants inside the abdominal cavity, resulting in secondary abdominal pregnancy.

Hepatic Pregnancy: A Rare Subtype of Abdominal Pregnancy

Primary abdominal pregnancies, in which the embryo implants directly on the liver's surface or inside its parenchyma, are the category under which hepatic pregnancy falls. It is a very uncommon phenomenon that has the following traits:

- can happen on any liver lobe, although because of its greater surface area, the right lobe is most frequently affected.
- implantation location that is extremely vascular, increasing the chance of a large haemorrhage
- may go unnoticed until it bursts, causing shock and hemoperitoneum.
- frequently necessitates intricate surgical or interventional care.

4. PATHOPHYSIOLOGY OF HEPATIC PREGNANCY:

Hepatic pregnancy is a rare form of primary abdominal ectopic pregnancy in which the fertilized ovum implants directly onto the liver surface or within the hepatic parenchyma**.** It represents an extraordinary deviation from the normal path of embryo implantation and is associated with high maternal morbidity and mortality due to the liver's rich vascular supply and the difficulty in managing bleeding from hepatic tissue.

1. Abnormal Fertilization and Embryo Migration

The zygote normally travels to the uterus for implantation after fertilization takes place in the fallopian tube's ampulla. The fertilized ovum, on the other hand, avoids or is expelled from the fallopian tube in hepatic pregnancy, eventually arriving in the peritoneal cavity and implanting on the liver. This can happen by:

- Primary abdominal pregnancy, or direct peritoneal implantation
- secondary implantation when a tubal pregnancy ruptures or is aborted

Implantation is usually primary in hepatic pregnancy, which means that the ovum implants on the liver without previously joining the uterus, ovary, or tube.

2.The Hepatic Implantation Mechanism

Although the precise process by which the embryo enters the liver and implants there is still unknown, the following suggestions have been put forth:

- **Peritoneal migration:** Because of gravity and fluid movement, the fertilized ovum may pass through the peritoneal fluid and enter the upper abdominal cavity.
- **Trophoblastic invasion:** The outer layer of the blastocyst, known as the trophoblast, is invasive by nature and can embed itself in highly vascularized surfaces, such as the liver.

- **Rich vascular environment:** The liver's large blood supply, which helps sustain the growing placenta, makes it a good area for implantation.

3. Vascular Compromise and Trophoblastic Invasion

A primitive placenta is created when the trophoblast invades the hepatic tissue after it has been implanted. But because the liver is not made to facilitate placental implantation, this can result in:

- Placenta anchoring is inadequate.
- invasion of the blood arteries and hepatic sinusoids, which are delicate and prone to breaking
- development of aberrant vascular connections, such as arteriovenous malformations or pseudoaneurysms

Particularly as the pregnancy progresses, this process frequently leads to progressive vascular compromise with an elevated risk of hemoperitoneum, intraparenchymal hemorrhage, and hypovolemic shock.

4. Systemic and Hormonal Alterations

The growing trophoblast continues to secrete β-hCG (human chorionic gonadotropin) in spite of the aberrant position, which could result in:

- Pregnancy tests that are positive
- Possible signs of pregnancy, such as breast tenderness, amenorrhea, and nausea

The diagnosis is made more difficult by the lack of uterine enlargement and the frequently irregular systemic hormonal changes.

5. Growth and Attachment of the Placenta

The placenta may infiltrate deeper hepatic parenchymal layers during hepatic pregnancy, occasionally reaching the portal triad, hepatic veins, or even Glisson's capsule. This may result in:

- Severe intraoperative hemorrhage during removal surgery
- Lack of a cleavage plane, in contrast to uterine pregnancies, makes it difficult to separate the placenta.
- If removal is not complete, there is a chance of remaining trophoblastic tissue and ongoing gestational trophoblastic illness.

6. Hemorrhage and Rupture

Rupture of the implantation site, which can happen naturally or as a result of surgical manipulation, is the most serious side effect of hepatic pregnancy. This leads to:

- Excessive bleeding inside the abdomen
- Instability in hemodynamics
- Diffuse intravascular coagulation risk (DIC)
- high maternal death rate if treatment is delayed

5. SYMPTOMS:

Hepatic pregnancy, a rare and potentially fatal variant of ectopic pregnancy, is characterized by the implantation of a fertilized ovum on the surface or parenchyma of the liver**.** Unlike tubal ectopic pregnancies, which typically present with more predictable clinical features, hepatic pregnancy often manifests with atypical and non-specific symptoms**,** making early diagnosis extremely difficult. Due to the liver's extensive vascular supply and the unusual implantation site, clinical presentation can vary widely and is often misleading.

In many cases, patients may remain asymptomatic during the early stages of gestation, with symptoms only becoming apparent as the pregnancy progresses or when complications such as rupture or hemorrhage occur. A high index of suspicion is crucial for diagnosis, especially when standard imaging fails to identify an intrauterine or tubal pregnancy.

This section presents a comprehensive analysis of the symptoms of hepatic pregnancy**,** emphasizing the mechanisms behind each presentation and their diagnostic significance.

1. **Pain in the abdomen**

The most prevalent and reliable symptom of hepatic pregnancy is abdominal pain. The degree of placental invasion, the existence of rupture or hemorrhage, and the gestational age can all have a substantial impact on its features.

Characteristics of Pain:

Location: Usually found in the abdomen's right upper quadrant (RUQ), which is where the liver is located anatomically. Pain, however, can occasionally be confined to the epigastric area or even generalized.

Quality: The pain might be mild and aching, throbbing, stabbing, or sharp, according to the patient.

Radiation: One important clinical indicator is referred pain to the right shoulder or scapular area. This is caused by blood or inflammatory fluid in the peritoneal cavity irritating the diaphragm (a sign known as Kehr's sign).

Onset: Pain might start slowly or come on suddenly, especially if the gestational sac ruptures or there is bleeding from the implantation site.

Severity: Mild to severe; in situations of rupture, pain can become unbearable and continuous, resulting in rebound soreness, peritonitis, and guarding.

2. **Bleeding in the vagina**

Vaginal bleeding is a common early symptom of tubal ectopic pregnancies, however in hepatic pregnancy:

- Particularly in the early stages, vaginal bleeding is frequently absent or very slight.
- It is typically unrelated to uterine cramps and, if present, may manifest as spotting or light bleeding.

- Blood may accumulate in the peritoneal cavity (hemoperitoneum) because to the non-genital implantation site, preventing bleeding from leaving through the vaginal canal. This can be fatal and go undetected until clinical deterioration.

3. Missed Menstrual Period, or amenorrhea

- The majority of women with hepatic pregnancy have experienced amenorrhea at some point throughout their pregnancy, usually between weeks 4 and 12.

- This frequently serves as the initial indicator of pregnancy.

- Even if transvaginal ultrasound does not show an intrauterine pregnancy, a positive urine or serum β-hCG test indicates the presence of gestation.

3. Symptoms of the Digestive System

Because they might mirror common illnesses like cholecystitis, peptic ulcer disease, gastroenteritis, or hepatitis, gastrointestinal (GI) symptoms in hepatic pregnancy are especially deceptive.

Typical GI issues consist of:

- Vomiting and nausea: Could be mistaken for gastrointestinal infections or typical early pregnancy symptoms.

- Anorexia or loss of appetite

- Abdominal fullness and bloating

- Discomfort in the stomach or indigestion

Consideration of an ectopic pregnancy may be delayed by these nebulous symptoms, especially if the patient does not exhibit vaginal bleeding or typical pelvic symptoms.

5. Shoulder Pain Referred

- An essential diagnostic signal is shoulder pain, especially on the right side.

- caused by fluid buildup close to the diaphragm or intra-abdominal hemorrhage that irritates the phrenic nerve.

- Although this symptom is frequently disregarded, it might raise suspicions of an ectopic pregnancy involving upper abdominal organs when it coexists with abdominal pain and a positive pregnancy test.

6. Symptoms of Hypovolemic Shock and Hemorrhage

Massive intra-abdominal hemorrhage may occur if the placenta erodes into the major hepatic blood veins or if the hepatic pregnancy ruptures. Signs of circulatory compromise result from this, which is a medical

emergency.

Among the indicators are:

- Abdominal pain that has suddenly become severe
- Syncope, or fainting, or dizziness
- Low blood pressure is known as hypotension.
- Heart rate rise, or tachycardia
- Pallor and clammy, chilly skin
- Confusion or restlessness (caused by decreased cerebral perfusion)
- Distension in the abdomen (indicating hemoperitoneum)

Such a presentation necessitates immediate diagnostic imaging and surgical intervention because it may resemble liver trauma, a ruptured hepatic adenoma, or a ruptured aneurysm.

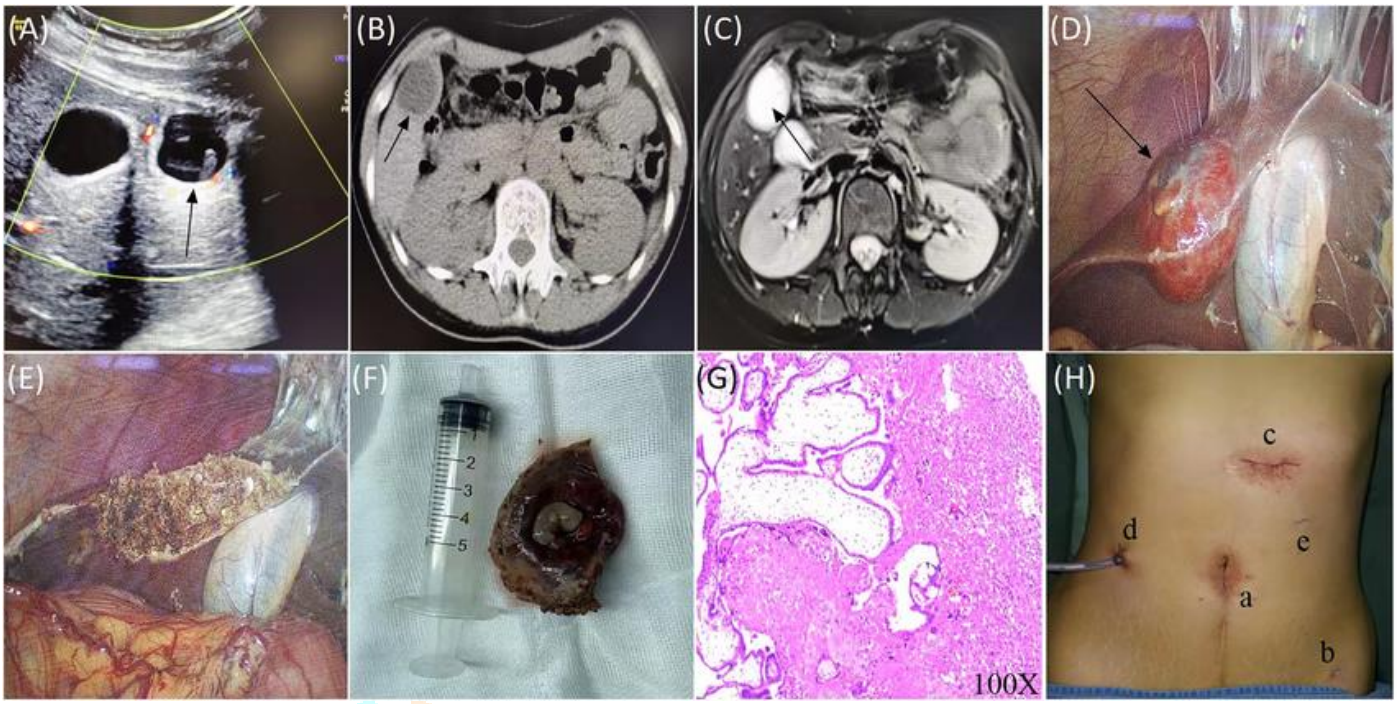
7. Additional Infrequent or Late Symptoms

In more complex or advanced situations, further symptoms could be:

- Jaundice is uncommon; however, it can happen if there is biliary obstruction or liver damage.
- Fever: In the event that an abscess or secondary infection forms at the implantation site.
- Shortness of breath: Due to diaphragmatic inflammation, raised diaphragm, or large-volume hemoperitoneum squeezing lung bases.
- Modified liver function tests (LFTs): In certain situations, particularly when the placenta infiltrates blood arteries or the hepatic parenchyma.

8. Lack of Pelvic and Uterine Symptoms

- Many patients do not exhibit the typical symptoms of pelvic ectopic pregnancy, such as uterine hemorrhage, adnexal soreness, or lower abdominal or pelvic pain.
- Unless doctors take into account extra-pelvic ectopic locations like the liver, this absence makes diagnosis even more difficult and takes longer.



6. DIAGNOSIS:

Because of its odd implantation site, nonspecific symptoms, and exceptional rarity, diagnosing hepatic pregnancy is a serious clinical issue. Hepatic pregnancy, which is frequently misdiagnosed or detected late, carries a high risk of maternal morbidity and mortality because of severe hemorrhage, particularly if rupture occurs. Thus, maximizing maternal outcomes requires an early and precise diagnosis.

Since there is no established diagnostic strategy for hepatic pregnancy, unlike the more prevalent tubal ectopic pregnancy, it may go undetected on initial imaging, particularly if doctors are not actively examining an abdominal or hepatic ectopic implantation. In situations when β-hCG is positive but no intrauterine or tubal pregnancy is found, a strong index of suspicion is essential.

1. Clinical suspicion

Identifying clinical red flags is the initial stage in the diagnosing process, particularly when a reproductive-age woman has a positive pregnancy test and vague stomach symptoms.

Important clinical characteristics that could cause suspicion:

- Positive β-hCG in the urine or serum
- Amenorrhea (period absence)
- Pain in the right upper quadrant or soreness in the epigastrium
- Pain at the point of the shoulder (referred from diaphragmatic irritation)
- Transvaginal ultrasonography showed no signs of intrauterine pregnancy.
- Pelvic imaging shows no tubal pregnancy or adnexal lump.
- indications of internal bleeding that are unclear in origin

In the presence of these characteristics, particularly when there is no discernible intrauterine or adnexal gestation, clinicians should broaden the differential diagnosis to include extra-pelvic ectopic pregnancies, such as hepatic pregnancy.

2. Research in the Lab

a. Human Chorionic Gonadotropin, or serum β-hCG

- Continued trophoblastic activity is indicated by positive and increasing β-hCG levels.
- However, there is no correlation between the location of the pregnancy and β-hCG levels.
- False reassurance may result from β-hCG in hepatic pregnancy being within the range anticipated for a typical intrauterine gestation.

b. Hematocrit and Hemoglobin

- It can be typical in the beginning.
- Low levels could be a sign of internal bleeding, particularly when there has been a rupture.

c. LFTs, or liver function tests

- usually normal, barring subsequent problems or hepatic parenchymal invasion.
- Hepatic inflammation may cause a little rise.

d. Profile of Coagulation

- crucial for preoperative preparation
- may exhibit anomalies in the event of disseminated intravascular coagulation (DIC) or substantial hepatic involvement.

2. Modalities of Imaging

The diagnosis of hepatic pregnancy relies heavily on imaging. Advanced imaging is crucial since traditional transvaginal ultrasonography may not detect the gestational sac due to its extra-pelvic position.

a. Ultrasound of the vagina and the abdomen

- When an ectopic pregnancy is suspected, first-line imaging
- could show:
  - Uterus empty and β-hCG positive
  - No tubal pregnancy or adnexal mass
  - Abdominal fluid that is free (indicating hemoperitoneum)
- Sometimes a gestational sac close to the liver can be seen on transabdominal ultrasonography, especially if the pregnancy is progressed and there is a fetal pole or heartbeat.
- Restrictions:

- The hepatic area is difficult to see clearly.
- Dependent on the operator
- may overlook early or minor hepatic pregnancies.

b. Focused RUQ Study Abdominal Ultrasound

- used to evaluate the upper abdomen and liver.
- could show:
  - Implanted on the liver's surface is the gestational sac.
  - Potential heart activity in the fetus
  - Intraperitoneal bleeding symptoms
- It is best to have a skilled sonologist or radiologist who is acquainted with uncommon ectopic presentations interpret it.

c. MRI, or magnetic resonance imaging

- The gold standard for stable patients' detailed imaging
- offers superior spatial resolution and soft tissue contrast.
- Benefits:
  - accurately pinpoints the gestational sac's position.
  - determines how far the placenta has invaded the liver tissue.
  - establishes the connection to the bile ducts, hepatic arteries, and surrounding structures.
  - Since there is no ionizing radiation, pregnancy is safer.

d. CT scan (computed tomography)

- Due to radiation exposure, it is often avoided during pregnancy, but it can be used in:
  - In an emergency situation where an MRI is not available
  - Evaluation after childbirth or after an abortion
- Beneficial for:
  - Evaluating hemorrhage
  - Vascular anatomy mapping
  - Organizing interventional radiology or surgical procedures

d. Ultrasonography using Doppler

- may indicate elevated vascular flow in the liver's implantation site.
- detects patterns of trophoblastic blood flow.
- helps distinguish hepatic pregnancy from other hepatic tumors, such as adenoma or hemangioma.

3. Distinguishing Diagnoses

Due to its infrequency, hepatic pregnancy is frequently misidentified as:

Condition	**Features**
Hepatic hemangioma	Benign vascular liver tumor; no β-hCG elevation
Hepatic adenoma or FNH	Common in young women, especially with OCP use
Liver abscess	Fever, leukocytosis, no β-hCG elevation
Cholecystitis	RUQ pain, positive Murphy's sign
Ruptured ectopic pregnancy (tubal)	Lower abdominal pain, vaginal bleeding
Subcapsular liver hematoma	Seen in HELLP syndrome or trauma

Advanced imaging, β-hCG values, and a thorough clinical history aid in differentiating hepatic pregnancy from these imitative conditions.

4. Diagnosis Intraoperative

Hepatic pregnancy is frequently not identified until surgical exploration (laparotomy or laparoscopy) is carried out for the following reasons:

- Shock and severe stomach ache
- Unaccounted-for hemoperitoneum
- Failures to use imaging to pinpoint the location of pregnancy

A placental tissue or gestational sac adhering to the liver may be discovered by the surgeon during surgery; this is frequently linked to rupture or active bleeding.

6. Verification via Histopathology

- By examining the removed tissue histopathologically, a definitive diagnosis is achieved.
- Usually, microscopy reveals:
  - Villi of Chorionic
  - Tissue trophoblastic
  - surrounding capsule or parenchyma of the liver

This is crucial for ruling out choriocarcinoma or gestational trophoblastic illness, particularly in instances with high or persistent β-hCG.

7. Diagnostic Laparoscopy's Function

- Diagnostic laparoscopy might be considered for stable individuals with inconclusive imaging.
- allows for direct sight of the liver and peritoneal cavity.
- permits possible therapeutic intervention (e.g., management of bleeding, excision of ectopic tissue).

However, emergency laparotomy is recommended for patients who are unstable or who have significant bleeding.

7. MANAGEMENT AND TREATMENT:

Because of the liver's high vascularity, the possibility of catastrophic hemorrhage, and the challenge of surgical access, hepatic pregnancy is one of the most dangerous types of ectopic gestation. A swift yet meticulously planned multidisciplinary strategy is necessary for management, comprising obstetricians, hepatobiliary surgeons, interventional radiologists, anesthesiologists, and critical care specialists.

Due to its rarity, there are no established treatment standards; instead, management plans are frequently tailored to the patient's hemodynamic status, placental invasion extent, gestational age, and evidence of bleeding or rupture.

Management's Objectives

- Keep the patient stable.
- Avoid or manage bleeding
- Preserve mother life (the main goal)
- Remove gestational tissue safely if at all possible.
- Avoid complications, including as infection, DIC, and retained products of conception.

1. **First Evaluation and Stabilization**

   A. Resuscitation in an emergency (if unstable)

   In individuals who exhibit indications of hypovolemic shock, rupture, or hemorrhage:

   - ABCs (airway, breathing, circulation): top priorities right away
   - IV access: Two intravenous large-bore lines
   - Crystalloids, such as Ringer's lactate or regular saline, are used in fluid resuscitation.
   - Red blood cells, fresh frozen plasma, and platelets are packed for a blood transfusion if necessary.
   - Cross-match blood: Ahead of a large-scale transfusion
   - Supplementing with oxygen
   - If necessary, admission to the intensive care unit (ICU)

2. Final Choices for Management

A number of factors determine the final course of treatment:

Factor	Influence on Management
Hemodynamic stability	Determines urgency of surgical intervention
Gestational age	Affects feasibility of conservative management
Extent of liver involvement	Influences surgical complexity
Availability of surgical and interventional expertise	Affects treatment modality
Presence of fetal cardiac activity	May require ethical or individualized decisions

A. Management by Surgery

The cornerstone of treatment is surgery, particularly for patients who are unstable or experiencing significant bleeding.

i. Laparotomy in emergency

- As stated in:
  - Instability in hemodynamics
  - Gestational sac rupture
  - Large-scale intra-abdominal bleeding
- Method:
  - Incision at the midline for broad exposure
  - Identifying gestational tissue on the surface of the liver
  - The main objective is bleeding control.
  - If the placenta is deeply implanted, avoid removing it with force since this could exacerbate the bleeding.

ii. Methods of Surgery

- If the implantation is limited and treatable, wedge resection
- Hepatic non-anatomic resection: For more extensive or profoundly invasive pregnancies
- Tamponade and packing: If bleeding is not under control
- Hepatic artery branch ligation: In certain situations

iii. Hazards

- Large-scale bleeding
- Injury to the bile duct
- infection following surgery
- Rarely, liver failure

B. Radiology Intervention

Interventional radiology can be extremely important in patients who are hemodynamically stable or as a supplement to treatment.

i. Embolization of Specific Arteries

- Hepatic arteries supplying the placenta might be embolized either before or after surgery.
- reduces the chance of bleeding during surgery
- In certain non-ruptured situations, it could be utilized as the main course of treatment.
- efficient in reducing the vascularization of trophoblastic tissue that persists

ii. Benefits

- Minimally intrusive
- keeps the liver parenchyma intact.
- lowers the need for transfusions

Limitations (iii)

- Not always accessible in emergency situations
- need an interventional radiologist with experience.
- In cases of advanced gestation with significant placental invasion, it is ineffective.

C. Rarely, conservative management

Conservative approaches may be taken into consideration in extremely early, unruptured hepatic pregnancies with stable vital signs and low levels of β-hCG:

i. Treatment with Methotrexate

- Systemic Methotrexate: Intramuscular administration
- Injection of local methotrexate: into the gestational sac (guided by imaging)
- recommended for fetal cardiac activity-free, early gestations (sac size <3.5 cm), and β-hCG levels < 5000 IU/L.

ii. Observation

- Repeated β-hCG readings until they drop
- Frequent MRI/ultrasound follow-up
- Keep an eye out for any indications of bleeding or rupture.

iii. Hazards

- Postponed rupture
- Inadequate trophoblastic tissue resolution
- Surgical intervention is required if treatment is unsuccessful.

8. HEPATIC PREGNANCY TREATMENT:

1. **The medication methotrexate (MTX) is used to treat ectopic pregnancy.**

Aspect	Details
Drug Class	Antimetabolite; folic acid antagonist
Mechanism	Inhibits DNA synthesis and cell replication in trophoblastic tissue
Indication	Used only in hemodynamically stable, early-stage hepatic pregnancies where surgical intervention poses high risk
Route	Intramuscular (IM), intravenous (IV), or oral administration (IM is preferred for ectopic pregnancies)
Dose (Single-Dose Regimen)	50 mg/m² IM once
Monitoring	Serial β-hCG levels on days 1, 4, and 7. If levels do not decrease by ≥15% between days 4 and 7, an additional dose may be required
Contraindications	Ruptured ectopic pregnancy, hepatic dysfunction, renal impairment, or blood dyscrasias

2. **Mifepristone (an adjuvant, optional)**

- Sometimes used in conjunction with MTX to boost effectiveness in situations of early ectopic pregnancy (experimental in hepatic pregnancy).
- Not typical.

3. **Drugs Applied to Surgical and Perioperative Care**

a. TXA, or tranexamic acid

Use of an antifibrinolytic to lower the risk of bleeding || Dosage | 1 g intravenously over 10 minutes before to surgery, repeat if necessary || Notes | Particularly helpful in cases of severe bleeding |

b. Intraoperative vasopressin

| Use | Locally injected around the ectopic location to minimize blood loss | | Caution | If systemic absorption does place, it may result in severe vasospasm and cardiac problems |

c. Epinephrine and Local Anesthetic Together

| Use | Local vasoconstriction during liver surgery | | Caution | Risk of arrhythmia with systemic absorption |

d. Prophylactic antibiotics

Cefazolin 1-2 g IV prior to surgery or a broader-spectrum medication (such as piperacillin-tazobactam) if infection is suspected | Example Regimen | Goal | Prevent postoperative infection or abscess |

e. Analgesics (Medication for Pain)

When taken at prescribed dosages, paracetamol (acetaminophen) is safe for the liver.

Opioids (such as fentanyl and morphine): For extreme pain, particularly after surgery.

If there is a high danger of bleeding or liver impairment, stay away from NSAIDs.

9. CONCLUSION:

If not identified and treated right once, hepatic pregnancy—a rare and severe type of abdominal ectopic pregnancy—carries a serious prognosis. It is one of the most deadly types of ectopic pregnancy because of its rarity, unusual appearance, and the liver's high vascularity. Fetal survival is extremely uncommon, yet maternal mortality is still significant in situations that go misdiagnosed or are poorly treated.

The availability of specialized care, clinical presentation, and diagnosis timing all have a major impact on the prognosis. Although improvements in imaging, surgery, and multidisciplinary care have led to better results recently, the illness is still linked to high rates of morbidity and death.

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