Acute Abdomen in Gynaecological Practice

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Abstract

Acute abdomen in pregnancy is due to consequence of pregnancy itself or is totally unrelated to pregnancy. During pregnancy, a woman is at an increased risk of acute abdomen due to various physiological changes. The article discusses the various conditions which can present as acute abdomen in women during pregnancy and in non-pregnant state. The clinician often has a difficult task in diagnosing and managing acute abdomen in pregnancy. Clinical evaluation is further confounded by various anatomical and physiological changes occurring in pregnancy. The growing gravid uterus too causes difficulty in detailed examination. The general reluctance to use conventional X-rays because of pregnancy should be set aside when faced with a seriously ill mother. A reluctance to operate during pregnancy adds unnecessary delay, which increases morbidity for both the mother and the fetus. Adnexal accidents should always be kept in mind in a woman with acute abdomen even if she is not pregnant. Such mistakes should be avoided as prompt diagnosis and appropriate therapy are crucial. A general approach to acute abdominal conditions in pregnancy is to manage these problems considering the risk to mother regardless of the pregnancy.

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Introduction

Evaluation of a female patient presenting with an acute abdomen must always consider surgical and gynecologic disorders in a pregnant or non pregnant state. Laparoscopy has a major impact on the surgical approach in gynaecology. Most cases of acute abdomen can now be approached laparoscopically [1]. Certain conditions however still require the traditional laparotomy. Preservation of reproductive capability has a major impact on the well being of a woman. Acute abdomen can present with either obstetrical or gynaecological conditions. Obstetrical causes of acute abdomen are dangerous as they may be potentially fatal and involve both the mother and fetus.

Non obstetrical abdominal surgery in the pregnant patient can be both diagnostically and technically challenging. Delay in diagnosis and definitive treatment represents the most common reason for the poor outcome of mother and fetus [2]. The diagnostic delay in pregnancy is because of several reasons. Often the patient and the doctor attribute certain vital signs and symptoms of disease exaggerating due to pregnancy itself. The pregnant abdomen may mask several classic findings of the disease. Added to above, many physicians tend to be more reluctant to subject the patient to special investigations even when it is considered to be essential. This results in delay of diagnosis with increase in

morbidity and mortality.

The issue of whether or not to administer prophylactic perioperative tocolysis to prevent preterm labour has not been resolved. The prophylactic use of beta-adrenergic tocolytic agent is not recommended because of the potential side effect of vasodilation. If premature contractions ensue, a single dose of terbutaline may be used. Magnesium sulphate may be added for long term tocolysis. Allen et al [3] showed fetal mortality of 2% and emphasized the fact that most fetal losses occur within one week of surgery. This is mostly attributed to the increased consequence of surgical intervention. Mazze and Kallen [4] in their study also support the same view. There was no increased risk of stillbirth or congenital malformations in 5405 women who underwent non obstetric operations in Sweden from the years 1973 to 1981.

Role of Laparoscopy

Diagnostic and therapeutic laparoscopy has increased over the decade with out increase in maternal and fetal complications. Reedy et al [5] reported 413 laparoscopic procedures performed during pregnancy. The most common laparoscopic surgery in pregnancy in this survey was cholecystectomy at 48.1%, surgeries of adnexa were 28%, appendectomies 16.2% and 7.5% were miscellaneous. Majority of the surgeries were performed in second trimester (54%). They concluded that

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laparoscopic surgery is safe during pregnancy as there was no increase in adverse maternal or fetal complications. However these retrospective surveys do not carry the same scientific significance as a prospective randomized study. Bordelon and Hunter [6] identified following issues for laparoscopy in a pregnant woman. They advocated safe laparoscopic access with a gravid uterus to avoid increased risk of injury. The trocar entry site for smooth conduct of the procedure in presence of enlarged uterus needs to be modified accordingly. Finally the possible adverse effect of pneumoperitoneum on fetal pathophysiology and blood flow should be identified for intra operative management.

Obstetrical Conditions

Acute abdomen in pregnancy poses a challenge to the attending physician as physiological changes that occur during the pregnancy will alter the clinical presentation of many conditions. In addition the reluctance to perform some diagnostic and surgical procedures during pregnancy often results in delay of diagnosis and definitive treatment [7]. The pain in pregnancy may be result of:

a. Physiological effects of pregnancy, b. Pathological conditions related to pregnancy, c. Pathological conditions unrelated to pregnancy

Physiological Conditions in Pregnancy

1. **Round Ligament Pain:** The pain is described as cramp like or stabbing which is made worse by movement and felt in the lower quadrant of uterus. It radiates to the groin and is associated with some tenderness over the area of round ligaments. This occurs in 10-30% of all pregnancies mostly in multigravidas. It commonly occurs towards the end of first trimester or second trimester.

Clinical Significance: It may be confused with pathological conditions like appendicitis, ovarian accidents, preterm uterine activity, placental abruption or urinary tract infection. The treatment of round ligament pain is by reassurance and rarely analgesics.

2. **Severe Uterine Torsion:** Mild asymptomatic axial rotation of the uterus to the right of about 40° is observed in majority of the pregnancies. Rarely this rotation progresses beyond 90° thus producing torsion causing severe pain in the third trimester of pregnancy. In 80–90% of the cases there are predisposing factors like fibroid, diadelphic horn of gravid uterus or history of adnexal pathology.

Clinical Significance: Fetal asphyxia and maternal vasovagal shock are the main risk. True diagnosis is made on laparotomy. Diagnosis before laparotomy warrants initiation of conservative management like bed

rest, analgesia and altering position of the mother. If the fetus is viable, the consensus is to unwind the uterus and perform a caesarean section. When the fetus has not attained period of viability it may be necessary to untwist the uterus during laparotomy and wait for the fetal viability.

Pathological Conditions related to Pregnancy:

The conditions can be broadly divided into two groups:

- a. Pathology related to Uterus
- b. Pathology related to Adnexa

Pathology Related to Uterus:

1. **Abortions:** It is the most common pathological cause of pain in the first trimester of pregnancy. Vaginal bleeding and cramp like pain is commonly seen in inevitable or incomplete abortion. However pain may not be a predominant symptom in cases of threatened abortion. The rare possibility of heterotrophic pregnancy should always be considered with extrauterine and intrauterine gestation commonly seen after artificial reproductive techniques.

Clinical Significance: Diagnosis is usually clinical and can be confirmed by ultrasound. Treatment is by suction and evacuation in cases of incomplete, inevitable or missed abortions.

2. **Leiomyoma Uterus:** About 10% of pregnant patients with leiomyoma experience abdominal pain associated with red or carneous degeneration. This is because of hemorrhagic infarction and thrombosis of the blood supplying to the tumor. The pain and tenderness is localized with low grade fever and leukocytosis. Intrapartum it may mimic abruption or rupture of the uterus. Pain may also arise from torsion of the pedunculated fibroid. Ultrasonography reveals fibroid at the site of maximum tenderness and helps in confirming the diagnosis.

Clinical Significance: Incorrect diagnosis leading to unwarranted surgical interventions often results in maternal fetal morbidity and mortality. It is often confused with acute appendicitis, acute pyelonephritis and placental abruption. Myomas larger than 3 cm increase the risk of preterm labour and placental abruption [8]. Management is conservative with analgesics until the pain subsides. Myomectomy during the pregnancy is to be avoided unless the Myomas are pedunculated.

3. **Placental Abruption:** Acute abdominal pain in 0.5–1% pregnancies could be because of placental abruption. Pain is very severe and of sharp with tearing nature. It is commonly associated with hypertension, multiple pregnancy, smoking and leiomyoma. It may or may not be associated with vaginal bleeding. The blood

loss is predominantly retroplacental. The diagnosis is mostly clinical.

Clinical Significance: When placental separation exceeds 50% then there is fetal demise with coagulopathy. Immediate delivery after hematological stabilization forms the main stay of treatment.

4. Chorioamnionitis: It is present in about 10% of the patients with preterm labour. The presence of uterine tenderness and pain, fever, fetal tachycardia and resistance to tocolysis is suggestive of chorioamnionitis.

Clinical Significance: The detection of bacteria in amniotic fluid is diagnostic and pregnancy should be terminated. Presence of chorioamnionitis is an indication for administration of appropriate antibiotics and discontinuation of tocolysis.

5. Uterine Rupture: Rupture of unscarred uterus is uncommon. It occurs in cases of pregnancy developing in malformed uterus, unsupervised doses of oxytocin administration, placenta percreta, obstructed labour and grand multiparous women. Rupture of a scarred uterus may occur either before or during labour. A lower segment scar has less chances of rupture compared to upper segment or classical scar. The risk of rupture is approximately 2% with an upper segment scar.

Clinical Significance: There is severe abdominal pain of continuous nature with signs of maternal hypovolemia. The risks to fetus are shock, anemia, hypoxia and death. The recurrence of rupture in subsequent pregnancy is very high. During pregnancy women with previous upper segment scar should be delivered electively by caesarean section. In labour there should be judicious use of oxytocics in multiparous women and any fresh vaginal bleeding should be evaluated by the obstetrician. Women with previous history of rupture should be counseled regarding risk in subsequent pregnancies and offered sterilization. All scarred uteruses with pregnancy should be evaluated in the antenatal period and delivery planned.

Pathology Related to Adnexa

1. Ectopic Pregnancy: It should be considered in any woman with lower abdominal pain in the first or early second trimester with or without minimal vaginal bleeding. Pain varies from minimal discomfort to that of extreme severe nature.

Clinical Significance: In late stages the diagnosis of rupture ectopic is obvious with an acute abdomen, hemorrhagic shock and positive pregnancy test. Serial β -human Chorionic gonadotropin estimation, transvaginal sonography and laparoscopy help in early diagnosis and treatment. Laparoscopic approach is useful for

hemodynamically stable patient. The choice of laparoscopic surgery versus laparotomy depends on the clinical experience of the surgeon, equipment availability and patient's physical status [9]. In women desiring fertility conservative tube sparing surgery has been recommended as it does not increase the subsequent recurrence of ectopic pregnancy [10]. Salpingectomy is the procedure of choice if the woman has no desire for future pregnancy.

2. Hemorrhage into Ovarian Cyst: Pain may be due to hemorrhage into the corpus luteum or other ovarian cysts. The pain is usually of mild to moderate nature and maternal pulse may not be raised. *Clinical Significance:* It can be diagnosed by ultrasonography and demonstration of intrauterine pregnancy helps to exclude ectopic pregnancy. Management is conservative.

3. Torsion of Ovarian Cyst: As the uterus and the adnexal structures ascend in the abdominal cavity with the advancement of pregnancy there may be torsion of pre existing ovarian cyst and adnexa with masking of traditional signs and symptoms. Torsion may present as acute pain in the lower quadrant of abdomen accompanied by nausea and vomiting. If torsion leads to infarction, the pain becomes more severe and constant. There is pyrexia, tachycardia and leukocytosis.

Clinical Significance: It is difficult to differentiate torsion from acute appendicitis, ectopic pregnancy and rupture of the adnexal cyst. Torsion may lead to miscarriage or preterm labour. Laparotomy is mandatory. The necrotic cyst should be clamped and removed avoiding the risk of embolization. If adnexal structures appear viable, ovarian cystectomy can be performed. If pregnancy is less than 8 weeks and involves removal of corpus luteum, progesterone support should be given [11].

Pathological conditions unrelated to Pregnancy

1. Acute Appendicitis: The diagnosis during pregnancy is challenging as the typical symptoms of anorexia, nausea and vomiting mimic normal pregnancy. The appendix is displaced upwards and to the right. The pain may be in the normal location of right lower quadrant or it may be in the right lumbar and loin area mimicking pyelonephritis or located in the sub hepatic region.

Clinical Significance: Appendicitis should always be considered when pregnant woman presents with abdominal pain, nausea, vomiting, fever and leukocytosis. The presentation is atypical due to the anatomical changes resulting in a delay of diagnosis. The features of guarding and rigidity of abdomen are masked by the pregnant uterus. There is a further reluctance to operate in a pregnant woman causing a further delay in treatment

which increases the risk of perforation, peritonitis and sepsis. This leads to increased risk of abortion, preterm labour and fetal demise. Laparotomy should not be delayed despite reported negative laparotomy rates being as high as 40% [12].

2. Intestinal Obstruction: It is attributable to the increased number of surgical procedures a young woman is subjected in the modern era. 60% of the cases are as a result of post operative adhesions [13]. Intussusception, hernias and complication of Crohn's disease can be complicated with intestinal obstruction.

Clinical Significance: Obstruction occurs more commonly with a growing uterus, ascending in abdomen during mid trimester and in labour. It may also manifest immediate post partum when uterus becomes smaller in size. Maternal and fetal mortality and morbidity is high if the intestinal obstruction is complicated by perforation, strangulation or fluid and electrolyte imbalance. Conservative management with intravenous fluid and nasogastric suction can be tried initially. Definitive surgical procedure may have to be preceded by caesarean section if access to the pathological site is difficult and fetal lung maturity is assured.

3. Acute Cholecystitis and Cholelithiasis: Asymptomatic cholelithiasis occurs in 3.5% of pregnant patients and is the cause of 90% of cases of cholecystitis in pregnancy. Patients present with right upper quadrant or epigastric pain of stabbing or colicky nature associated with nausea, vomiting, abdominal tenderness and fever. Ultrasound scan will demonstrate gallstones in 90% cases [14].

Clinical Significance: It is important to differentiate from the HELLP syndrome with the presence of hemolysis, elevated liver enzymes and low platelets and severe pre-eclampsia which is associated with maternal and fetal mortality. Management during the first and third trimester is conservative with analgesics, intravenous fluids and nasogastric suction. Surgery is indicated in recurrent attacks, failure to respond to conservative treatment, suspected perforation, empyema of gall bladder and peritonitis. It is advisable to operate in second trimester. Laparoscopic cholecystectomy can be performed in the first trimester but in third trimester laparotomy may be essential.

4. Acute Pancreatitis: It is rare in pregnancy but it is also associated with presence of the gall stones. It presents usually in the late trimester or soon after delivery. There is upper abdominal pain radiating towards the back associated with recurrent vomiting, dehydration and shock. A raised serum amylase concentration clinches the diagnosis.

Clinical Significance: Dehydration and shock

contributes to high maternal mortality. Serum amylase levels may be normal with hemorrhagic pancreatitis leading to necrosis. The recommended treatment is similar to the nonpregnant state consisting of intravenous fluids to maintain electrolyte balance, analgesia and prevention of infection. The termination of pregnancy has no influence on the course of the disease [15].

5. Acute Cystitis: Pregnancy does not increase the risk of cystitis but two thirds of the pregnant women who get cystitis have sterile urine at their first antenatal visit. Dysuria is the most significant symptom in pregnant woman with cystitis. Obstructive uropathy and stasis during the second and third trimester are the predisposing factors for acute pyelonephritis.

Clinical Significance: Majority of the woman with acute pyelonephritis develop asymptomatic bacteriuria and they should be treated with appropriate antibiotics.

6. Acute Fatty Liver of Pregnancy: Patient complains of sudden onset of nausea, vomiting, abdominal pain and jaundice. Serum bilirubin levels are raised with liver enzymes. There is associated leukocytosis, thrombocytopenia, hypoglycemia and coagulation defect. After correcting fluid and electrolyte imbalance with coagulation defect, prompt delivery should be considered.

Clinical Significance: Delay in treatment will result in high incidence of maternal and fetal mortality and morbidity.

7. Rectus Hematoma: In late pregnancy, due to a bout of coughing or direct trauma, a branch of inferior epigastric vessels may rupture causing hematoma. This presents as unilateral painful swelling that may rarely be associated with shock.

Clinical Significance: This swelling can be confused with an ovarian cyst, placental abruption, degenerating fibroid or uterine rupture. It is managed by analgesics and bed rest. Surgical intervention may be required in hemodynamically unstable patient.

8. Porphyria: Acute intermittent Porphyria presents with abdominal pain, constipation, gastrointestinal symptoms and autonomic nervous system disturbances.

Clinical Significance: Pregnancy can precipitate an attack and porphyria can present for the first time in pregnancy. It can also mimic neuropsychiatric disorder presenting for the first time in pregnancy.

Gynaecological Conditions

1. Adnexal Torsion: Many pathological diseases of the ovary and fallopian tube cause their enlargement and increase the risk of twisting of the adnexa upon the axis of infundibulopelvic ligament. This is an acute emergency as prolonged torsion leads to infarction of

the tube and ovary. The ovarian enlargement size predisposing for torsion is 10 to 12 cm. Solid tumors like dermoid cyst are prone for torsion. All slow growing heavy tumors with long pedicles are conducive for torsion on change of position most commonly on right adnexa.

Clinical Significance: Patient presents with acute severe pain, lateralized to the right or left lower quadrant of abdomen accompanied by nausea and vomiting. Pelvic examination may reveal tender mass on the affected side. Pain is described as knife like and is proportional to the degree of venous interruption. A history of waxing and waning of pain due to twisting and untwisting of adnexa is also possible. Low grade fever and leukocytosis may occur. If necrosis and infection of the twisted organ occurs then high grade fever may ensue. Traditionally, adnexal torsion was treated with salpingo-oophorectomy of the involved side. However, laparoscopy has become the preferred surgical approach both for diagnosis and treatment. Current conservative management involves unwinding of the adnexa and assessing its viability. Unwinding the torsion was initially condemned for fear of releasing potentially fatal embolus [16]. No emboli complications have been noticed by several authors in their series of studies [17].

2. Hemorrhagic Functional Ovarian Cyst:

Rupture of a follicular cyst may cause acute onset of pain that is short lived. Corpus luteums are very vascular and life threatening hemorrhage may ensue if they rupture. The acute pain associated with ruptured of corpus luteum is often confused with ruptured ectopic. The identification of intrauterine gestational sac excludes the diagnosis of ectopic pregnancy.

Clinical Significance: If hemorrhage is severe, it may produce abdominal distension and shock. Emergency laparotomy is indicated when patient is hemodynamically unstable. Diagnostic and therapeutic laparoscopy is appropriate if patient is hemodynamically stable.

2. Pelvic Inflammatory Disease and Tubo-Ovarian Abscess:

Pelvic inflammatory disease and subsequent tubo-ovarian abscess may result whenever bacteria gain access to the upper genital tract. The rate of tubo-ovarian abscess developing from typical pelvic inflammatory disease has been reported to be 1% to 4%. Woman presenting with pelvic inflammatory disease and a pelvic mass may have tubo-ovarian abscess or it could be a hydrosalpinx or tubo-ovarian complex mass. Patients with tubo-ovarian abscess present with history of pelvic or abdominal pain and fever associated with leukocytosis. A history of pelvic inflammatory disease may be present only in 50% of the patients. Pelvic examination reveals extreme pelvic and cervical motion

tenderness with adnexal mass. If rupture has occurred, typical symptoms of peritonitis may ensue.

Clinical Significance: In a scenario of questionable diagnosis or if there is evidence of rupture of tubo-ovarian abscess immediate surgical intervention is recommended. Otherwise medical therapy with or without drainage procedure is the acceptable form of management to preserve fertility. Drainage of the abscess with CT or ultrasound guidance and drainage via laparoscopy are other available modalities. In patients who have completed childbearing, total abdominal hysterectomy with bilateral salpingo-oophorectomy is the standard therapy.

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