

Spontaneous Non-Traumatic Splenic Rupture in Twin Pregnancy

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Abstract

The authors present a case of a 34-year-old woman with twin pregnancy who presented with acute abdomen and haemorrhagic shock due to splenic rupture at 33 weeks and further discuss the difficulties that might ensue when diagnosing acute abdomen is made in a pregnant woman.

The occurrence of an acute abdomen in a pregnant woman is always a cause for concern, given the vast differential diagnosis for the problem and the potentially harmful consequences for both the mother and foetus. Acute abdominal pain during pregnancy can be attributed to either obstetric factors or for reasons unrelated to the pregnancy itself.

The diagnostic approach to acute abdomen during pregnancy can be challenging due to the differences in the clinical signs and symptoms associated with anatomical and physiological variations related to pregnancy. Certain radiological investigations should be used with caution to prevent unfavourable effects to the foetus. Postponement diagnosing and managing acute abdominal pain in pregnancy can lead to undesirable maternal and foetal outcomes.

The aim of this report is to review and discuss the various aetiologies, current concepts of diagnosis, and treatment to develop a strategy for timely diagnosis and management of pregnant women presenting with acute abdomen.

Keywords: ectopic pregnancy, rupture uterus, abdominal pain, appendicitis, cholecystitis, acute abdomen, pregnancy

Case Report

A 34-year-old female (gravida 5; para 3; miscarriage 1) at 33 weeks, with dichorionic diamniotic (DCDA) twins was referred from a secondary-level hospital with upper gastrointestinal (GIT) bleeding based on a history of abdominal pain and coffee-grounds vomiting. An upper GIT endoscopy at the referring hospital found esophagitis with no active upper GIT bleeding, which did not explain the patient's condition. The patient was a citizen from a neighbouring country working on farms near Bloemfontein, Free State. This was the patient's first antenatal presentation.

At our unit, the patient complained of abdominal pain and vomiting with no history of trauma or bleeding per vagina. She had two previous caesarean sections with no significant medical history before the pregnancy.

On general examination, the patient had pallor, hypotension (blood pressure (BP) 79/49 mmHg) and tachycardia (pulse rate 123 beats/min). Per-abdominal examination revealed a distended, tense and tender abdomen with a fundal height of 45 cm. Per-vaginal examination showed that the cervix was not dilated with no bleeding. Resuscitation with intravenous (IV) fluid, blood products and oxygen was already started at the referring facility and established during admission.

The trans-abdominal and vaginal ultrasound scanning revealed an intrauterine twin pregnancy with both foetuses without a heartrate; no retro-placental clot was seen. On investigation, the patient's haemoglobin (Hb) level was 7.4 g/

dl and platelet count 211.000 per μ l. Kidney function test and clotting profile were normal.

Differential diagnosis of rupture uterus or placenta abruption was made, and operative intervention was done with a midline laparotomy. Per-operative findings revealed massive hemoperitoneum (2 litres of blood), but the uterus was intact. A lower segment uterine incision was performed, and fresh stillborn twins were delivered, the first baby was female, and the second baby was male; both were in a transverse lie, amniotic fluid was clear, and there were no retroplacental clots.

On further abdomen exploration, active bleeding was identified from the spleen, and multiple haemostatic stitches were done with the application of Surgical® to achieve good haemostasis. The patient received 2 units of red blood cells and 2 units of fresh frozen plasma intraoperative. The patient received antibiotics postoperatively, and postoperative recovery was uneventful.

Introduction

Acute abdomen during pregnancy can be caused by various aetiologies - obstetric or non-obstetric, as illustrated in Figure 1. A systematic approach, including detailed patient history, physical examination, and laboratory and radiological investigations, is necessary for an accurate diagnosis. Anatomical and physiological changes in pregnancy should be considered as these changes mask the typical presentation of the conditions causing acute abdomen, making interpreting symptoms, signs, and biochemical and radiological investigations challenging. There is also the fear of foetal exposure to ionizing radiation, causing a delay in using imaging modalities which help to reach prompt diagnosis.^{1,2}

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Figure 1: Causes of acute abdomen in pregnant women by organ system³

HELLP = haemolysis, elevated liver enzymes, low platelet count

OBSTETRIC CAUSES	NON-OBSTETRIC CAUSES
<ul style="list-style-type: none"> • Miscarriage • Ectopic pregnancy • Placental abruption • Preterm labour • Severe pre-eclampsia and HELLP* syndrome • Uterine rupture 	<p>Gynaecological</p> <ul style="list-style-type: none"> • Adnexal mass or ovarian cyst • Adnexal torsion • Uterine leiomyoma • Endometriosis • Pelvic inflammatory disease <p>Gastrointestinal</p> <ul style="list-style-type: none"> • Appendicitis • Inflammatory bowel disease • Intestinal obstruction • Gastroesophageal reflux • Peptic ulcer disease • Splenic rupture <p>Hepatobiliary</p> <ul style="list-style-type: none"> • Cholelithiasis or choledocholithiasis • Acute cholecystitis • Acute pancreatitis • Hepatitis • Acute fatty liver of pregnancy <p>Genitourinary</p> <ul style="list-style-type: none"> • Hydronephrosis of pregnancy • Urolithiasis • Pyelonephritis • Cystitis <p>Vascular</p> <ul style="list-style-type: none"> • Gonadal vein thrombosis • Mesenteric vein thrombosis • Gonadal vein syndrome • Aneurysm rupture • Vasculitis

Anatomical changes in pregnancy affecting the diagnosis of acute abdomen

The mechanical stretching and loss of elasticity of the abdominal muscle fibres by the gravid uterus influence the signs of peritoneal irritation, such as muscle guarding.⁴ The gravid uterus causes displacement of adjacent intra-abdominal viscera from their normal position, causing a shift of the stomach, omentum, appendix and intestines upward and laterally. The appendix can move into the right upper quadrant and lies closer to the gall bladder at term with narrowing and mechanical compression of the colon.^{5,6} The displacement of the omentum interferes with signs of peritonitis. The adnexa lie posterior to the gravid uterus from the second trimester, making palpation of ovarian pathology only possible by vaginal examination. The gravid uterus also compresses the ureters, causing hydronephrosis and hydronephrosis, mimicking urolithiasis.⁶

In pregnancy, the physiological changes of cardiovascular, respiratory, gastrointestinal, renal, haematological and endocrine systems allow for the development of the foetus and the demands on the mother for childbirth.

The total white blood cell count is elevated in pregnancy, which makes it less useful in the clinical evaluation of inflammation.¹ Furthermore, there is an increase in plasma volume to red blood cell volume, which leads to a fall in haemoglobin concentration, haematocrit and red blood cells. In addition to an increased

heart rate, cardiovascular changes make the clinical evaluation of haemorrhage challenging.⁷ In terms of gastrointestinal changes, nausea and vomiting are common complaints in 50-90% of pregnancies, besides being one of acute abdomen presentation.⁸ Serum amylase levels change in pregnancy, making the interpretation of results challenging in pancreatitis.⁹

A clinician's awareness of physiological and anatomical changes and the landmark displacement in pregnancy will aid in early diagnosis and prompt surgical intervention leading to better maternal and perinatal outcomes.

Aetiologies

Pregnancy-related causes could be physiological or pathological. Stretching of the round ligament is a physiological condition causing cramping or stabbing pain in the lower abdomen in 10-30% of pregnancies; it is a diagnosis of exclusion and responds well to analgesia.⁹

Braxton-Hicks contractions cause irregular abdominal pain in frequency and intensity, starting from the second half of pregnancy, which is usually misdiagnosed as labour.⁹

Abdominal pain in early pregnancy may be due to miscarriage or an ectopic pregnancy. Patients present with a history of amenorrhoea, pain and bleeding. In addition to the history, a vaginal examination is a crucial assessment to reach the diagnosis and an ultrasound to confirm the diagnosis. In the second half of pregnancy, preterm labour pain is characteristic with increasing severity and associated with a show and cervical changes.

Non-haemorrhagic obstetric shock can be attributed to pulmonary thromboembolism, amniotic fluid embolism, acute uterine inversion and sepsis. Although these complications do not occur frequently, they are associated with most maternal deaths in the developed world.^{10,11} When pulmonary thromboembolism is indicated based on clinical presentation, it should initially be managed with heparin, and unbiased investigations should be conducted. Upon verification of the diagnosis, heparin therapy is usually maintained until delivery, with anticoagulation continued postpartum by administration of either warfarin or heparin.¹⁰ Emboli occurring in the amniotic fluid embolism is an exceptional pregnancy-related complication that usually present during the peripartum period. Amniotic fluid embolism management includes maternal oxygenation, sustaining cardiac output and blood pressure, and control of any concomitant coagulopathy.¹¹ Acute uterine inversion is most frequently related to mismanagement of the third stage of labour.¹² Shock associated with uterine inversion results from neurogenic mechanisms, although extensive haemorrhage may also occur. The management of acute uterine inversion requires maternal resuscitation and repositioning of the uterus either manually, surgically or by means of hydrostatic pressure.¹² Genital tract sepsis is a persistent major cause of maternal death, with prolonged rupture of the foetal membranes most frequently identified as the primary predisposing factor.¹³ Septic shock in pregnancy is managed by resuscitation, detecting of the source of infection and modification of the systemic inflammatory reaction.¹³

In placenta abruption, a patient presents with abdominal pain and vaginal bleeding, and on examination, the uterus is tender and hard with difficulty in palpating the foetus. A haematoma might be visible on ultrasound examination, and foetal loss might occur. Diagnosis is mainly clinically and supported by blood results showing low haemoglobin level, renal failure and coagulopathy.