

Difficulties in Evaluating the Pregnant Patient with Abdominal Pain: A Case Report of Uterine Rupture

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ABSTRACT

Pregnant patients with abdominal pain present a unique challenge to physicians who care for them. The clinician needs to consider common causes of abdominal pain, causes that may be more common due to pregnancy, obstetrical complications, and overall alterations to the anatomy and physiology of a pregnant female. Ultimately, life threatening conditions in the mother must be ruled out because the well-being of both the mother and fetus are dependent on maternal health. The clinician must also consider minimizing potential harm to the fetus by limiting radiation. This case highlights important considerations when evaluating pregnant women with abdominal pain.

A 31-year-old G5P0224 (5 total pregnancies, 0 full term deliveries, 2 pre-term deliveries of twins, 2 spontaneous abortions, 4 living children) female at 15 weeks who was pregnant with her third set of natural twins developed abdominal pain, nausea, coffee ground emesis, diarrhea, melena, and syncope. She underwent a magnetic resonance imaging (MRI) study

examining her abdomen and pelvis while in the Emergency Department. She was found to have a large amount of free fluid in the abdomen and around the liver. Shortly after returning from MRI, the patient became hypotensive with a hemoglobin drop from 8.0 g/dL to 5.4 g/dL. She was taken for an emergency exploratory laparotomy and was found to have a uterine rupture. The patient required a supracervical hysterectomy with additional left salpingectomy to achieve hemostasis. She went on to achieve a complete recovery and was discharged from the hospital on post-operative day five.

This case report demonstrates the need for a high index of suspicion when evaluating pregnant women with abdominal pain. When evaluating the pregnant patient, it is important to remember that pregnant women can develop both non-obstetric and obstetric causes of abdominal pain, and these conditions can occur simultaneously.

INTRODUCTION

Abdominal pain is a common complaint during pregnancy and can be caused by a number of processes ranging from benign physiological and anatomical changes of pregnancy to more serious pathological conditions.¹⁻³ Obstetric sources of abdominal pain during pregnancy

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include conditions such as chorioamnionitis, placental abruption, threatened pre-term labor, ectopic pregnancy, or uterine rupture. Anatomical changes of pregnancy that predispose patients to abdominal pain include round ligament strain, gastroesophageal reflux disease (GERD), pelvic infections, and urinary tract infections. Pregnant patients are also susceptible to pathologic causes of abdominal pain unrelated to pregnancy such as appendicitis, pancreatitis, cholecystitis, neoplasms, kidney stones, and gastric ulcers.¹⁻³ Due to the myriad of causes of abdominal pain in the pregnant female, assessment of the pregnant woman with abdominal pain should be carried out in an efficient and effective manner. Special care also should be taken to minimize danger to the fetus while thoroughly evaluating the mother.¹⁻⁴ This case report demonstrates that pregnant women with abdominal pain are susceptible to a number of different conditions which should be considered when forming a differential diagnosis.

CASE PRESENTATION

A 31-year-old pregnant G5P0224 female with a history of two classical cesarean sections, was confirmed at nine week abdominal ultrasound to have one low lying intrauterine pregnancy (IUP) and a possible anembryonic pregnancy at the fundus. Fetal heart rate of the IUP was documented to be 170 beats per minute and within normal limits. The ultrasound showed no signs of ectopic pregnancy or signs that the IUP had implanted into the patient's cesarean scar. When the patient was at 15 weeks and 3 days of pregnancy she woke up at 1:00 AM with nausea and bilious emesis, which she attributed to her normal symptoms of pregnancy. The previous day the patient felt well and was able to eat a full meal at dinner. Around 2:00 AM she began to experience constant, diffuse abdominal pain

that was worse in the epigastric region and left upper quadrant. The patient then developed diarrhea, one episode of melena, and one episode of coffee ground emesis. Immediately afterward, the patient's husband witnessed the patient have a 15-30 second syncopal episode that he interpreted as a "seizure." She was noted to be unresponsive, with her eyes rolled back, and she was trembling. There was no bowel or bladder incontinence, limb jerking, fall, injury, or postictal state. The patient was scheduled to have an outpatient appointment with her obstetrician that morning to have an ultrasound performed; however, due to her symptoms, her husband called Emergency Medical Services (EMS). While EMS was transporting the patient to the hospital she had three more syncopal episodes. EMS reported that the patient was hypotensive en route to the hospital with blood pressure as low as 80/50 mmHg before responding to intravenous fluids (IVF).

Upon arrival to the Emergency Department (ED), she had a blood pressure of 98/52 mmHg, a temperature of 96.4°F, a heart rate of 128 beats per minute, a respiratory rate of 26 breaths per minute, and an oxygen saturation of 96% on room air. She reported personal history of hypertension, infrequent migraine headaches, and two classical cesarean sections. She had no other medical problems, surgeries, or known drug allergies. The patient denied personal history or family history of any hematologic disease or seizures. She was taking prenatal vitamins but no other medications. The patient denied experiencing any contractions, vaginal bleeding, or leakage of fluid. She also denied use of tobacco, alcohol, or illicit drugs. On exam, the patient was found to have diffuse tenderness to palpation with increased pain in the epigastric region. Abdomen was soft, gravid, with mild voluntary guarding, no rebound, and hypoactive bowel sounds. The fundus was not palpable, and there was no costovertebral angle (CVA) tenderness. Speculum exam showed that the

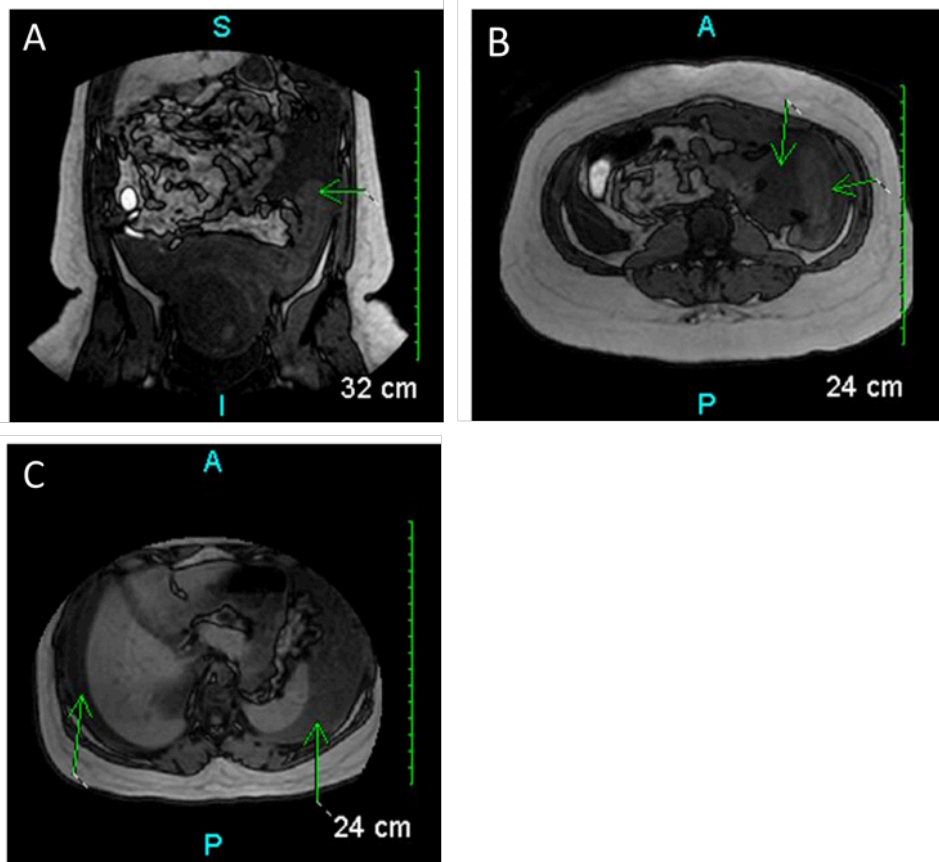


Figure 1. Abdominal MRI. A) Free fluid pooling in the left upper quadrant; B) Free fluid surrounding the spleen; C) Free fluid is seen collecting around the liver and tracking into the left lower quadrant.

cervical os was closed without vaginal bleeding, discharge, or lesions. Only one set of fetal heart tones were found and these were determined to be 160 bpm using a bedside ultrasound. Lab work ordered in the ED initially showed an elevated white blood cell count (WBC) of 23.5 k/uL and a low hemoglobin of 8.0 g/dL. At this point the differential diagnosis was concerning for an upper gastrointestinal bleed versus obstetric complication based on the patient's clinical and laboratory findings. Computed tomography (CT) scan of the abdomen/pelvis and abdominal x-ray were not obtained due to pregnancy; therefore, the decision was made to order an MRI of the abdomen and pelvis. The patient had difficulty completing her MRI due to progressively worsening abdominal pain and nausea. She had to stop the scan several times

before being able to lie still long enough for imaging to be completed. MRI results showed a large amount of free fluid in the abdomen and around the liver (Figure 1). After the MRI, the patient became hypotensive (85/46 mmHg) and her hemoglobin dropped to 5.4 g/dL. The trauma team then decided to take the patient to the operating room to evaluate for intraabdominal hemorrhage. The patient's husband provided consent for surgery and any life-saving treatments.

The patient was taken to the operating room by the trauma surgery team. She was noted to be in hemorrhagic shock requiring a vertical midline incision. Upon entering the abdominal cavity, hemoperitoneum was immediately identified, and the abdomen was appropriately packed. It

was then discovered that the patient had a uterine rupture with a fetus still within the uterus in an amniotic sac. An anembryonic pregnancy was also noted at the fundus. There were no other abdominal injuries identified. Obstetrical surgeons then took over care and decided the uterus could not be salvaged due to the extensive nature of the uterine rupture. It was deemed necessary to convert from a uterine repair to a supracervical hysterectomy with additional left salpingectomy secondary to a nonhemostatic left fallopian tube. The patient was actively resuscitated throughout the surgery by the anesthesia team, requiring a total of 8 units of packed red blood cells (PRBC), 4 units of fresh frozen plasma (FFP), and 1 unit of platelets while in the operating room. Upon surgical closure the patient remained intubated and was transferred to the intensive care unit (ICU) for further care. The fetus that was found within the uterus initially had a heart beat but ultimately expired. Pathology confirmed placenta percreta, an abnormal implantation of the placenta into the uterine wall in which the villi invade through the myometrium. Pathology showed no evidence of an ectopic pregnancy within the fallopian tube or cesarean scar.

On post-operative day one the patient was extubated and received 1 unit of FFP and 1 unit of platelets. On post-operative day three the patient was transfused with an additional 2 units of PRBCs and transferred out of the ICU. Neurology consultation was obtained for evaluation of questionable “seizures” during the patient’s initial presentation. MRI of the brain was normal and neurology attributed her syncopal episodes to vasovagal responses from vomiting, diarrhea, and blood loss. Gastroenterology specialists were also consulted for evaluation of the patient’s coffee ground emesis and melena. An esophagogastroduodenoscopy (EGD) showed gastritis and a 5 mm gastric ulcer that was appropriately clipped. She was started on a

proton pump inhibitor (PPI) and scheduled for gastroenterology follow up. By post-operative day three the patient was also able to tolerate an oral diet, a transition to oral analgesia, and ambulation with the assistance of physical therapy/occupational therapy. The patient was discharged home on post-operative day five.

DISCUSSION

Pregnant women commonly present with abdominal pain and it is the clinician’s job to determine whether that abdominal pain is caused from a benign anatomical change of pregnancy or a more serious pathological condition.¹⁻³ In this case, we examined a pregnant 31 year old G5P0224 female at 15 weeks and 3 days of pregnancy with generalized abdominal pain that was ultimately diagnosed as uterine rupture and a gastric ulcer. The mechanism of uterine rupture in this case was attributed to a placenta percreta that had implanted into the patient’s classical cesarean scar. Uterine rupture was not immediately identified in this case due to a number of confounding factors. The patient initially presented with symptoms related to her gastric ulcer which included coffee ground emesis, melena and epigastric pain. She was also experiencing syncopal episodes that were ultimately attributed to vasovagal syncope from her vomiting, diarrhea, and blood loss. Furthermore, the majority of cases of uterine rupture occur in the third trimester when patients are in active labor. This patient presented in an atypical fashion because she presented early in her second trimester and was not in active labor.

During the course of the case, MRI was selected instead of CT or x-ray in order to limit the exposure of radiation to the fetuses. At the time this decision was made the patient was stable, alert, oriented, and was not exhibiting signs of an

acute abdomen. In addition, a bedside ultrasound found a single set of fetal heart tones that were within normal limits at 160 beats per minute. A second set of fetal heart tones was initially expected since the patient reported that she was pregnant with twins. However, based on the patient's nine week ultrasound and the resultant surgical findings of the case, the patient's second fetus was an anembryonic pregnancy and never developed a heartbeat. A formal ultrasound was not obtained initially because the source of the patient's bleeding appeared to be coming from the gastrointestinal tract, which is better visualized by MRI.⁴ In retrospect, a CT would have yielded faster results concerning the patient's condition and would have gotten the patient to the operating room faster. Once the patient began to display worsening symptoms in the MRI machine, it would have been reasonable to forego the MRI for a CT. It can also be argued that because the patient was in her second trimester, the probability of negatively affecting the pregnancy from CT radiation would have been low.²

After a previous classical cesarean delivery, the reported risk of uterine rupture ranges from 1% to 12%.⁵ There is no reliable way to predict uterine rupture in women with a prior cesarean delivery, but the most common technique used to preemptively evaluate cesarean scars is with ultrasound. The thickness of the residual myometrium in the lower uterine segment and the width, depth, and length of the hypoechoic uterine defect at the site of the previous cesarean site are the typical areas evaluated to determine risk of rupture.⁷ There is currently no myometrial thickness depth that is sensitive enough to use in clinical practice to predict whether a cesarean scar will rupture or remain intact.⁸ In the case of our patient, placenta percreta may have been detected earlier if the patient had undergone an MRI earlier in her pregnancy to evaluate the integrity of her

classical cesarean scar. MRI, compared to ultrasound, is more sensitive for the detection of placental invasion into the uterine wall.⁹

Once uterine rupture has occurred it is best diagnosed based on clinical findings rather than with imaging due to the limited time available before irreversible physiologic damage occurs to the mother and fetus. Based on case reports, the most common conditions associated with uterine rupture include: prolonged deceleration in fetal heart rate or bradycardia,^{10-12,15-17} abnormal pattern in fetal heart rate,^{10-12,15-17} previously scarred uterus,¹³⁻¹⁵ oxytocin stimulation of labor,^{13,14} cephalopelvic disproportion,^{13,14} grand multiparity,¹³⁻¹⁵ abruptio placentae,¹³ fetal malpresentation,¹⁴ uterine hyper-stimulation,¹⁵ vaginal bleeding,^{11,15} shock,^{11,15} abnormal labor or failure to progress,¹⁵ abdominal pain,^{11,12,15} and loss of intrauterine pressure or cessation of contractions.^{10,15}

In most cases of acute uterine rupture there is little time to perform diagnostic imaging, and there is currently no strong evidence to support one imaging modality over another. Given these limitations, ultrasound is considered to be the first line imaging tool to evaluate the status of a cesarean scar.^{4,9} Magnetic Resonance Imaging (MRI) and Computed Topography (CT) are also useful imaging modalities. MRI is hypothesized to be superior to CT for evaluating the status of a cesarean scar because of its superior ability to evaluate soft tissue structures.^{4,9} Principle limitations of MRI are length of acquisition time and sensitivity to patient movement.⁴ CT images can be obtained more rapidly but are used sparingly in pregnancy, especially early in pregnancy, due to ionizing radiation. CT still remains the modality of choice for the evaluation of blunt abdominal trauma.⁴

Surgery is the definitive treatment for any case of uterine rupture. Once the diagnosis is made the mother should be immediately stabilized and

brought to the operating room. It is also imperative to deliver the fetus as soon as possible. It has been reported that the time available for successful intervention after acute uterine rupture and before onset of major fetal morbidity is 10-37 minutes.¹⁶⁻²⁰ The optimal repair technique for uterine rupture has not been established due to the rarity of uterine rupture, variability in location, extent of damage, and scarcity of long-term follow-up data.²¹ Women who desire future pregnancies and are amenable to treatment should receive conservative surgical uterine repair with a traditional hysterotomy closure plus any additional interventions to help achieve adequate preservation of the uterus.²² Uterine bleeding is typically most profuse when there are multiple tears or when the uterine tear is longitudinal rather than transverse. Most cases of uterine rupture ultimately require a hysterectomy in order to achieve hemostasis.²¹ Rates vary between industrialized versus developing countries with rates of performed hysterectomies ranging between 6-78%.²³⁻²⁴

A further consideration that must be addressed in cases of uterine rupture is the psychosocial damages related to the patient's prognosis. Over the past few decades the infant mortality rate after uterine rupture has improved, but the reported perinatal death rate is still approximately 2% in the United States.²⁵ Maternal death as a consequence of uterine rupture occurs at a rate of 0-1% in modern developed nations but can reach as high as 5-10% in developing countries.^{24,26} Throughout our patient's hospital course and after discharge, the patient and her family were offered counseling and access to spiritual care resources. In this case, the patient not only went through a life-threatening surgery, but also suffered from the loss of her pregnancy. Assessment and interventions are important during the acutely stressful phase following the event, the ensuing adjustment period, and the

process of dealing with chronic grief. With appropriate psychosocial support, patients and their families may be better able to undergo the grieving process.

LEARNING POINTS

1. Pregnant women can develop both non-obstetric and obstetric causes of abdominal pain, and these conditions can occur simultaneously. Clinicians should consider first focusing on the obstetric causes of abdominal pain in the pregnant patient due to the relatively brief time that interventions are available to preserve maternal-fetal wellbeing once an obstetric disaster occurs.
2. Indicated diagnostic imaging and interventions should be performed in a timely manner, with ultrasound and MRI as the mainstay of imaging in the pregnant patient. A CT scan may be necessary in emergent situations.
3. The clinical diagnosis of uterine rupture should be strongly considered, regardless of imaging confirmation, when a pregnant woman shows signs of internal bleeding, deteriorating vital signs, or hypovolemic shock. Fetal heart tones should also be monitored to determine the well-being of the fetus.

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