# Gynecology & Reproductive Health

## Referred Shoulder Pain as the Presenting Symptom of Uterine Rupture – A Case Report

Dr. Brent Mitchell Bodily, MD; Dr. Eric Michael Schmitt, MD; Dr. Jamie Humes DO

Department of Gynecologic Surgery and Obstetrics, Tripler Army Medical Center, 1 Jarrett White Rd, TRIPLER AMC, Honolulu, Hawaii.

#### \*Correspondence:

Brent Mitchell Bodily, Department of Obstetrics and Gynecology, Tripler Army Medical Center, 1 Jarrett White Rd, TRIPLER AMC, Honolulu, Hawaii.

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rather than fetal tracing abnormalities or abdominal pain. This rare presentation is poorly described in existing literature, and lack

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and delivery unit for a planned repeat cesarean section at 39 weeks

0 days gestation. She had a history of two prior cesarean deliveries.

Her pregnancy was otherwise complicated by gestational diabetes

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## ABSTRACT

Uterine rupture is a potentially catastrophic obstetrical complication that could lead to maternal and fetal morbidity and mortality. It is typically detected after fetal monitoring reveals abnormalities in the fetal heart tracing or when the mother experiences abdominal pain, which occurs even in the presence of epidural anesthesia. This case report aims to highlight an unusual presentation of uterine rupture where the presenting symptom was shoulder pain rather than fetal tracing abnormalities or abdominal pain. This rare presentation is poorly described in existing literature, and lack of awareness of this possible presentation can cause significant morbidity and mortality to both mother and child.

A 33-year-old gravida 4 para 2-0-1-3 presented to the labor and delivery unit for a planned repeat cesarean section at 39 weeks 0 days gestation. The fetal heart rate tracing was unremarkable, however, the patient reported 5 out or 10 shoulder pain that started the night prior. During her operation she was incidentally found to have a uterine rupture. After delivery and repair of this defect, the shoulder pain quickly resolved.

Medical providers are typically taught that the classic presentation of uterine rupture involves intense abdominal pain accompanied by abnormal fetal heart rate patterns. However, this case report highlights referred shoulder pain alone in the absence of these other findings as an atypical presentation of uterine rupture. The proposed explanation is that the irritation of the phrenic nerve by the free abdominal amniotic fluid resulted in the patient perceiving pain in her right shoulder region. Providers evaluating a term patient with shoulder pain, especially in the setting of risk factors for potential rupture such as a prior cesarean delivery, must consider uterine rupture in their differential diagnosis.

#### **Keywords**

Referred Pain, Uterine Rupture, Obstetrical Emergencies, atypical presentation of Uterine rupture.

## **Purpose/Objective**

Uterine rupture is a potentially catastrophic complication of labor that could lead to maternal and fetal morbidity and mortality. It is typically detected after fetal monitoring reveals abnormalities in the fetal heart tracing or when the mother experiences abdominal pain, which can occur even in the presence of epidural anesthesia [1-3]. This case report aims to highlight an unusual presentation of requiring insulin for glucose management, gastroesophageal reflux, mild anemia, and an unstable fetal lie. When offered a trail of labor versus repeat cesarean delivery, the patient elected to schedule a repeat cesarean delivery.

On the day of her procedure, the patient reported experiencing 5 out of 10 intensity right shoulder pain that started the night prior. The pain had been severe enough that she almost went to the emergency room to be evaluated and was still significant on presentation to the Labor and Delivery ward. On review of systems the day of the surgery, she denied any chest pain, shortness of breath, numbness, or paresthesia.

The patient was monitored on external fetal cardiac monitoring for approximately one hour which showed a fetal baseline of 140 beats per minute, moderate variability, 15 x 15 beats per minute accelerations, and a single late deceleration. On the tocometer, she was noted to have contractions every 5 to 10 minutes. During this time her vital signs remained within normal limits. A transabdominal ultrasound was performed and the fetus was confirmed to be in the breech presentation. Given the patient's history of gastroesophageal reflux disease she was administered famotidine, labs were ordered, and an electrocardiogram (EKG) was performed. A comprehensive metabolic profile (CMP), complete blood count (CBC), and b-type natriuretic (BNP) peptide levels were normal. The EKG was normal sinus rhythm.

The patient was taken to the operating room, where neuraxial anesthesia was obtained. A cesarean delivery was then initiated in the usual fashion via a Pfannenstiel skin incision. When the peritoneum was entered, a gush of clear fluid with vernix particulates was noted followed by palpation of fetal parts in the peritoneal cavity.

The uterus was exposed and the breech presenting part was visualized protruding from the lower uterine segment. The neonate was then delivered through the uterine rupture via breech delivery maneuvers. The fetus had spontaneous movement and a vigorous cry. The Apgar score was 8 and 9 at 1 and 5 minutes of life.

The placenta was then removed without resistance. The inspection of the hysterotomy was notable for a single extension midline in the direction of the bladder. The hysterotomy and extension were closed with a polyglactin suture. The remainder of the procedure was completed in the usual fashion and without complication. The patient was transferred to the post-anesthesia care unit in stable condition. Her recovery and follow-up care would be routine.

## Discussion

Typically, the presentation of uterine rupture is characterized by intense abdominal pain and dramatic changes in the fetal heart rate tracing such as deep variable or terminal decelerations [2]. However, in this case the patient did not exhibit these classic signs, which caused the uterine rupture to be undetected until the time of surgery. While our outcome was positive, this easily could have

caused severe morbidity or mortality to mother or child.

On presentation, the patient reported intense right shoulder pain, which had nearly prompted her to seek emergency care the previous night. Workup revealed a normal CBC, CMP, BNP, and EKG. Upon entry to the abdomen, it became apparent that the shoulder pain was likely referred pain resulting from free amniotic fluid in the abdomen as a result of a uterine rupture.

Pain is commonly classified into various categories including somatic, visceral, nociceptive, radicular, and neuropathic. A lesserknown category is referred pain. Referred pain is defined as pain that spreads to areas distant from the site of the noxious stimulus, without being caused by nerve root stimulation [4].

The exact pathophysiology of referred pain is not fully understood. The most widely accepted theory is the convergence theory. This theory proposes that afferent stimuli converge on second-order spinal cord neurons leading to cross-stimulation that is then perceived as pain in different somatic locations. This phenomenon is colloquially referred to as the "crossed power lines" theory [4].

In this case, when the uterus ruptured, amniotic fluid spilled into the peritoneal cavity. The escaped fluid likely activated the nociceptive receptors along the phrenic nerve [3]. The phrenic nerve originates from the anterior rami of C3 through C5 and innervates the diaphragm [5]. When the diaphragm is exposed to noxious stimuli, such as blood from a splenic rupture or purulent material from an abscess (or in this case amniotic fluid), it can produce referred shoulder pain in a phenomenon known as the Kehr sign [5-7].

## **Summary/Conclusion**

Medical providers are typically taught that the classic presentation of uterine rupture involves intense abdominal pain accompanied by abnormal fetal heart rate patterns. However, this case report highlights referred shoulder pain alone in the absence of these other findings as an atypical presentation of uterine rupture. The proposed explanation is that the irritation of the phrenic nerve by the free abdominal amniotic fluid resulted in the patient perceiving pain in her right shoulder region. Providers evaluating a term patient with shoulder pain, especially in the setting of risk factors for potential rupture such as a prior cesarean delivery, must consider uterine rupture in their differential diagnosis.

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