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Original Article

Rupture of Bicornuate Uterus: A Case Report

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ABSTRACT

Background: Uterine anomalies, particularly the bicornuate uterus, pose significant risks to pregnancy outcomes, often leading to complications such as recurrent pregnancy loss, preterm birth, and cervical insufficiency. The bicornuate uterus, characterized by a partial fusion of the Müllerian ducts, represents a unique clinical challenge, particularly when pregnancy occurs in a rudimentary horn.

Objective: To report a rare case of early second-trimester rupture in a primigravida with a bicornuate uterus, discussing the diagnostic challenges and management strategies, as well as highlighting the importance of recognizing uterine malformations as a differential diagnosis in early gestation presentations.

Methods: A retrospective case review was conducted, detailing the presentation, diagnosis, and management of a 25-year-old primigravida who presented with acute abdominal pain at 14 weeks and 5 days of gestation. Clinical assessment included a thorough physical examination, sonographic imaging, and emergent laparotomy. The diagnostic process examined vital signs, abdominal conditions, and ultrasound findings, leading to surgical intervention. Preoperative and postoperative care procedures were analyzed.

Results: The patient's emergency ultrasound indicated hemoperitoneum and an empty uterine cavity, with a nearby gestational sac corresponding to a 10-week fetus. Laparotomy revealed 2.5 liters of hemorrhagic fluid and a ruptured rudimentary horn with a 4 x 2 cm rent. Postoperative recovery was uneventful, and histopathological examination confirmed the bicornuate nature of the uterus.

Conclusion: This case elucidates the critical need for vigilance and early diagnostic consideration of congenital uterine anomalies in pregnant patients presenting with non-specific abdominal pain. Effective management and improved outcomes hinge upon rapid identification and treatment of such high-risk pregnancies.

Keywords: Bicornuate Uterus, Uterine Rupture, Rudimentary Horn Pregnancy, Müllerian Duct Anomalies, Obstetric Complications, Emergency Laparotomy, Second Trimester Pregnancy, Maternal Health.

INTRODUCTION

Uterine rupture represents a dire emergency in obstetrics, typically associated with a higher frequency in multigravida or previously scarred uteri, and commonly occurring during labor (1). Despite its rarity in the early stages of pregnancy, such instances, particularly in the first and second trimesters, are often related to congenital uterine malformations (0.1–3.0%) (2, 3). These anomalies are even more prevalent among women who have experienced recurrent pregnancy loss, with figures reaching up to 10% in those who have undergone three or more consecutive miscarriages (4, 5). Bicornuate uterus, a result of incomplete merging of the bilateral Mullerian ducts during fetal development (6), constitutes approximately 25% of all Mullerian duct anomalies (5). This particular uterine configuration is frequently linked with adverse pregnancy outcomes including mid-trimester miscarriage and premature labor, yet the occurrence of uterine rupture remains exceedingly infrequent. This report delves into a rare case of a bicornuate uterus that resulted in rupture at 14 weeks and 5 days gestation (6, 7). The distinctiveness of this case lies in the temporal peculiarity of the rupture, coupled with the anatomical idiosyncrasy of the uterus, underscoring the critical importance of heightened clinical vigilance and prompt management in pregnancies complicated by Mullerian duct anomalies (6, 7).

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MATERIAL AND METHODS

A 25-year-old primigravida at 14 weeks and 5 days gestation presented with a one-day history of acute, moderate to severe, non-relieving abdominal pain, localized to the lower abdomen (8-10). The clinical presentation was notable for the absence of vaginal bleeding, fever, vomiting, or significant abdominal distension. Upon examination, the patient exhibited considerable pallor. Vital signs included a pulse rate of 130 beats per minute, blood pressure at 100/60 mmHg, and a respiratory rate of 20 breaths per minute (11, 12). The abdomen was notably distended, with palpation eliciting guarding and rigidity, yet no masses were discernible and bowel sounds were absent. A per vaginal examination revealed cervical motion tenderness, with all fornices full, while the precise dimensions of the uterus could not be determined. Further assessments revealed a clear chest and normal cardiac function. A positive urine pregnancy test led to an emergent abdominal ultrasound, which indicated the presence of hemoperitoneum and a slightly enlarged uterus with an empty cavity. Adjacent to the left uterine wall, a gestational sac containing a fetus with a crown-rump length corresponding to 10 weeks was visualized. Aspiration of peritoneal fluid under ultrasonography, which remained unclotted, pointed towards a ruptured ectopic pregnancy (13, 14).

During the subsequent laparotomy, approximately 2.5 liters of hemorrhagic fluid were evacuated from the peritoneal cavity. Examination revealed a bicornuate uterus with a ruptured right rudimentary horn measuring between 5 and 6 centimeters at the fundus, through a rent measuring 4 by 2 centimeters (15). The fetus and sac were located within the peritoneal cavity. The left horn was excised and sent for histopathological evaluation. Preoperative management included the transfusion of three units of blood. The patient experienced an uneventful postoperative recovery, was counseled to use contraception for a minimum of one year, and subsequently discharged.

FINDINGS

The critical findings in this case encompass the ruptured bicornuate uterus with an associated gestational age discrepancy between ultrasound measurement and actual gestation, the extraction of a significant volume of hemorrhagic fluid (2.5 liters), and the dimensions of the uterine rupture (4 x 2 centimeters). Furthermore, the surgical intervention involved the excision of the affected uterine horn, followed by an uncomplicated postoperative course and the administration of a substantial blood transfusion (three units). The visual representation of the case is encapsulated in a composite figure, consolidating the individual images (Figures 1-9) into a single illustrative depiction.

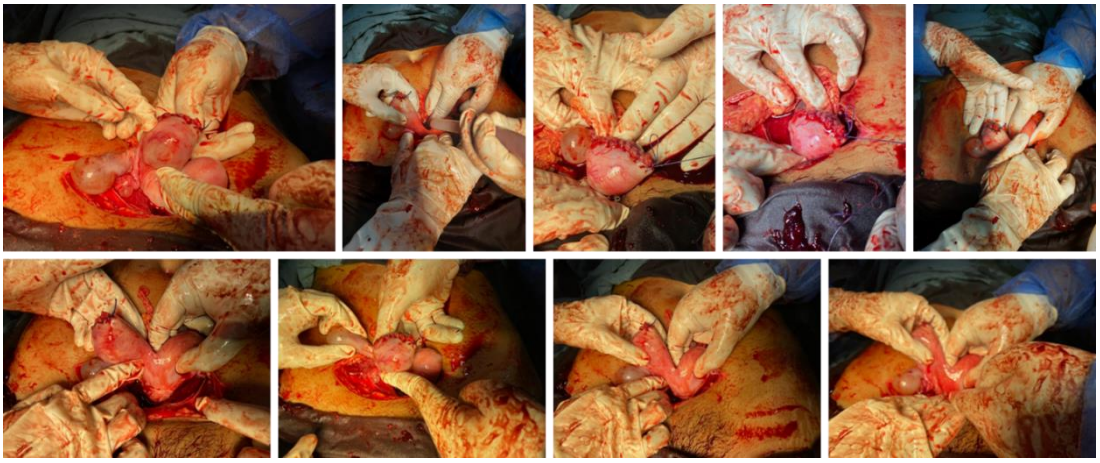

Figure 1 Surgical intervention involved the excision of the affected uterine horn

DISCUSSION

Pregnancies within a bicornuate uterus are conventionally deemed high-risk, necessitating enhanced surveillance due to the associated reduction in reproductive outcomes (16). While bicornuate uteri can carry pregnancies to term and there are documented instances of successful twin deliveries within such a configuration, the optimal mode of delivery, whether vaginal or cesarean, remains a matter of clinical decision-making (17). Typically, a pregnancy within the well-developed horn of a bicornuate uterus proceeds without significant complication; it is primarily when implantation occurs within a rudimentary horn that a heightened risk emerges. The bicornuate uterus is linked with an increased likelihood of recurrent pregnancy loss (25%) (9), preterm birth (15–25%) (10), and cervical insufficiency (38%) (11). Although the incidence of pregnancy in a rudimentary horn is markedly low, estimated at around 1 in 400,000 (1), such cases warrant urgent attention (18).

In the current case, the rupture of a non-communicating left horn in a bicornuate uterus in a primigravida at 14 weeks and 5 days gestation underscores the necessity for considering congenital uterine anomalies in early-trimester rupture cases. While gynecological sonography, including sonohysterography and magnetic resonance imaging, can diagnose a bicornuate uterus, these are not standard investigations for asymptomatic women, which means the anomaly may remain undetected until pregnancy or

delivery, often during cesarean sections for malpresentation (18). The confluence of hysteroscopy and laparoscopy represents the most reliable diagnostic approach, typically engaged during infertility assessments (19).

The Strassmann metroplasty, a preconception transabdominal procedure, has been shown to substantially improve fetal survival rates in pregnancies associated with rudimentary horns, from nearly null to 80% (12). Rupture typically ensues due to the malformed uterus's inability to accommodate the gestational expansion, with ruptures occurring from late first to early second trimester, although there are instances extending into the late second trimester (20). Hemorrhage resulting from such ruptures presents a grave risk, necessitating prompt and aggressive management. For instance, Kotecha et al. documented a case where rupture ensued as late as 25 weeks of gestation (21, 22). The treatment involves surgical excision of the affected horn to mitigate the risk of future ruptures during subsequent pregnancies within the same horn (23).

The present case highlights several salient points: uterine rupture may transpire as early as 14 weeks and 5 days in cases of malformed uteri, mirroring the clinical presentation of a ruptured ectopic pregnancy and emphasizing the importance of including uterine malformation in the differential diagnosis of acute abdominal conditions in early pregnancy. This case contributes to the limited literature on such presentations and provides a valuable reference point for clinical vigilance. However, it also highlights inherent limitations, such as the rarity of the condition impeding large-scale studies, and potential weaknesses in the preoperative diagnostic process, where the rarity and unpredictability of rudimentary horn pregnancies can lead to misdiagnosis. To improve outcomes, the recommendations include increased awareness of this condition, considering uterine anomalies in the differential diagnosis of any pregnant patient presenting with acute abdominal pain, and a multidisciplinary approach for management. Future research should focus on the development of guidelines for the monitoring and treatment of pregnancies in women with known uterine anomalies (24).

CONCLUSION

The case underscores the critical need for heightened awareness and surveillance of congenital uterine anomalies, particularly bicornuate uteri, in prenatal care. This awareness is essential for the timely diagnosis and intervention of high-risk conditions such as rudimentary horn pregnancies, which can lead to life-threatening complications like uterine rupture. It reinforces the necessity for a multidisciplinary approach to management, including surgery, and the potential for improved outcomes with preconception planning. Ultimately, this case has significant implications for healthcare providers in optimizing maternal health and fetal outcomes, highlighting the balance between vigilant prenatal care and the preparedness for emergency interventions.

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