

Pregnancy in a Ruptured Non-communicating Rudimentary Horn: A Case Report

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ABSTRACT

The rudimentary horn is a Müllerian duct anomaly. In instances of pregnancy within a non-communicating rudimentary horn, timely diagnosis is imperative to prevent life-threatening complications. Ultrasound only demonstrates 26-33% sensitivity, leading to misdiagnoses for tubal, intrauterine, or abdominal pregnancies. We present a case of a 20-year-old female, gravida 2 para 1 (G2P1), who conceived spontaneously while experiencing constant mild lower abdominal pain throughout the earlier stages of pregnancy. Pregnancy in non-communicating rudimentary horns advanced to twenty weeks of gestation. The diagnosis was made when the horn ruptured, resulting in hemoperitoneum and hemodynamic instability. An emergency exploratory laparotomy was performed, uncovering a complete rupture of the pregnant rudimentary horn, leading to hemi-hysterectomy and removal of the left fallopian tube. The rudimentary horn was completely ruptured and lacked direct communication with the right unicornuate uterus cavity. The diagnostic and management challenges associated with rudimentary uterine horn highlight the need for heightened vigilance to prevent associated morbidity.

Keywords: Pregnancy, Rudimentary, Uterus; Müllerian anomaly.

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INTRODUCTION

Rudimentary horns develop from incomplete closure of the Müllerian ducts, with about 83% featuring a contralateral non-communicating horn¹. If one duct partially merges with the other, it can form a unicornuate uterus with a rudimentary horn, a rare anomaly occurring in 0.4% of cases. These horns are clinically significant due to complications like hematometra, endometriosis, and various gynecological or obstetric issues, which are often identified only after conception. Pregnancy in such horns can cause severe morbidities, including uterine rupture and hemor-

rhage. We present a case of a unicornuate uterus containing a 20-week gestation within a cavitated rudimentary horn. The absence of communication between the two horns led to the misdiagnosis of ruptured ectopic pregnancy that was managed via laparotomy with horn resection.

CASE REPRESENTATION

A 20-year-old female, gravida 2 para 1 (G2P1), who had experienced one previous miscarriage, was referred from a peripheral hospital due to acute abdominal pain and vomiting. She had been married

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for four years and was currently 20 weeks pregnant. Although she had undergone ovulation induction in her previous pregnancy, this conception was spontaneous.

Her menses began at the age of 15 with a 28-day cycle lasting four days, with moderate flow and dysmenorrhea, with a pain score of 7/10, predominantly on the left side. She confirmed her pregnancy through a urine strip test but could not recall the exact date of her last menstrual period. Throughout the earlier stages of pregnancy, she experienced constant mild lower abdominal pain. While a fetal cardiac flicker was detected on the initial scan, she had not felt any fetal movements to date.

Upon admission, a diagnosis of ruptured ectopic pregnancy was considered. On examination, she was alert but hypotensive with a blood pressure of 90/51 mmHg and a pulse rate of 138 beats/min. Upon abdominal inspection, the abdomen was distended, tense, and tender on palpation. Per speculum examination, she revealed a closed cervical OS with mild bleeding. Per vaginal examination, she revealed difficulty in assess-

ing uterine size, fullness in the vaginal fornixes, positive cervical excitation, and mild bleeding. Laboratory tests showed a hemoglobin level of 6.3 g/dl.

The patient had no prior workup done. The ultrasound scan revealed hemoperitoneum and suggested a ruptured ectopic pregnancy with a differential diagnosis of a ruptured uterus. Due to unstable vitals, further investigations such as an MRI were not done and a consultant gynecologist performed an emergency laparotomy. During surgery, the peritoneal cavity was found to be filled with blood clots, and approximately three liters of blood were drained. The rudimentary horn was completely ruptured and lacked direct communication with the uterine cavity of the unicornuate right uterus (Figure 1A). A non-viable fetus weighing 359 grams was removed from the abdominal cavity (Figure 1B). The rudimentary horn left the fallopian tube was excised, while both ovaries were normal. During the surgery, the patient was given five units of packed red blood cells and two units of platelets. Following the operation, she recovered without any complications and was discharged in a stable condition.

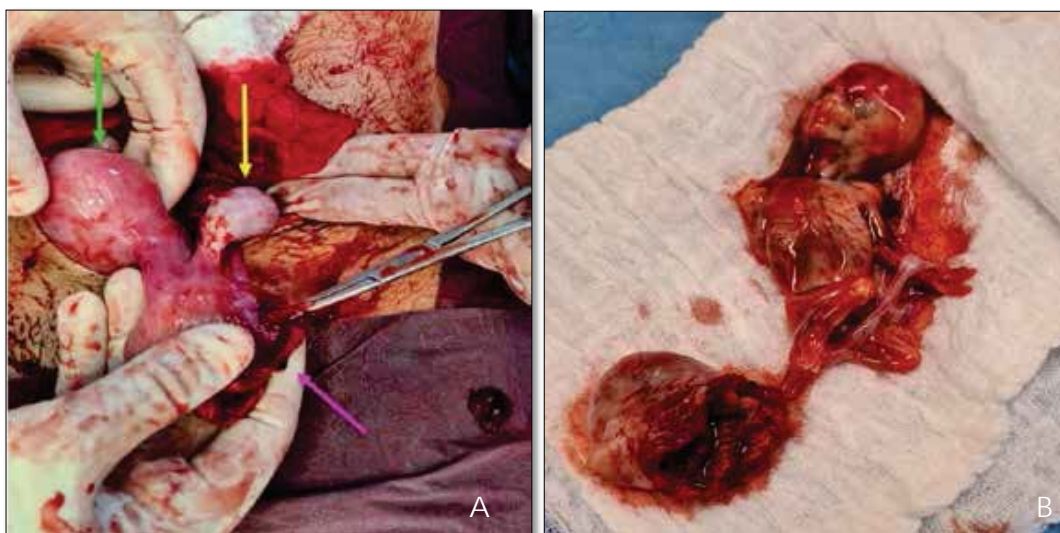


Figure 1: A) Intraoperative findings. The green arrow denotes the unicornuate uterus. The yellow arrow represents the ovary. The pink arrow indicates the ruptured uterine horn. B) Fetus removed with placenta from the abdominal cavity.

Histopathological examination revealed an excised fallopian tube measuring 2.5 x 0.5 cm and a separately present serosa-covered nodular tissue piece measuring 4.5 x 4.2 x 1.5 cm. Sections examined revealed the uterine wall exhibiting infiltration of the myometrium by mature-looking chorionic villi and trophoblastic cells. Sections of the fallopian tube showed no significant pathological changes. She had a follow-up

appointment in the clinic 21 days after the procedure and experienced a smooth recovery. One year later, the patient conceived spontaneously. Her pregnancy progressed smoothly to full term, and she delivered a healthy baby girl via elective cesarean section. Both the mother and the baby remained in good health and were discharged in stable condition.

DISCUSSION

Incomplete fusion of the Müllerian ducts during embryonic development can lead to various uterine anomalies. If one duct partially merges with the other, it can result in a unicornuate uterus with a rudimentary horn, occurring in 0.4% of cases. About 84% of these women have a contralateral rudimentary horn, and 92% of these horns are non-communicating². Rudimentary horn pregnancy is even rarer, with an incidence of 1 in 76,000 pregnancies². Full-term pregnancies in a rudimentary horn are extremely rare but pose significant life-threatening risks³. If pregnancy occurs in rudimentary horns, it can result in significant morbidities and mortalities such as uterine rupture and hemorrhage. Pregnancy in a non-communicating rudimentary horn arises from the transperitoneal migration of sperm or a fertilized ovum. This condition is associated with a heightened risk of preterm labor, rupture of the uterus, and intraperitoneal hemorrhage. This anomaly is also related to ipsilateral urinary tract abnormalities, with an incidence of 36%. Major renal anomalies, including renal agenesis and pelvic kidney on the same side as the non-communicating rudimentary horn, occur in 31% to 100% of cases⁴. Diagnosing before rupture is uncommon, but ultrasonography and MRI scans can help make this diagnosis¹.

Timely identification of pregnancy in a rudimentary uterine horn can mitigate maternal morbidity and mortality, although it may not notably affect neonatal survival rates. Detection in the first trimester has decreased maternal mortality from 23% to 0.5%⁵. Uterine rupture commonly occurs during the first and second trimester in approximately 80% of cases. Diagnosis is typically made in only 8% of cases before the onset of symptoms⁵. Transvaginal ultrasound and MRI are effective in distinguishing a bicornuate uterus from a unicornuate uterus with a rudimentary horn before pregnancy, as the rudimentary horn is smaller. However, during pregnancy, diagnosing a rudimentary horn pregnancy preoperatively is challenging, with only a 5% success rate and ultrasound sensitivity at 26%⁵. MRI, with its superior imaging capabilities, generally provides higher sensitivity in such cases. It's important to note that while ultrasonography can detect Müllerian abnormalities, confirmation via MRI is recommended⁵. In cases where available, three-dimensional (3D) ultrasound can serve as a cost-effective alternative. Ultrasound only demonstrates 26-33% sensitivity, leading to frequent misdiagnoses for tubal, intrauterine, or abdominal pregnancies^{7,8}.

Medical termination using methotrexate has been shown to effectively halt pregnancy in early stages and prevent uterine rupture in hemodynamically stable patients⁵. This was not the case with us as the pregnancy was advanced and the horn was already ruptured. Medical management with methotrexate, followed by surgical resection, can be employed to reduce uterine blood flow in rudimentary horn preg-

nancies^{5,9}. Early diagnosis is key for successful management. While medical treatment is safe, it doesn't prevent pregnancy recurrence in the rudimentary horn. Surgical excision and salpingectomy can occur weeks after treatment cessation to reduce risks. Surgical intervention is crucial for preventing possible endometriosis caused by transibial menstrual reflux and avoiding intracorneal pregnancy implantation, as well as for preventing recurrence, relieving symptoms, and avoiding complications^{9,10}. Most cases come to light after rupture, often resulting in a misdiagnosis of uterine rupture¹¹. In our case, while the radiologist initially identified it as an ectopic pregnancy, a ruptured uterus was also considered as a potential diagnosis.

The approach to treating pregnancy in a rudimentary horn involves removing the rudimentary horn and its associated fallopian tube, either via laparotomy or laparoscopy. In instances where rudimentary uterine horn ruptures, surgery not only aids in diagnosis but also serves as the definitive treatment. For patients aiming to maintain fertility, the recommended procedure involves removing the rudimentary horn and the fallopian tube on the same side (ipsilateral salpingectomy) to prevent future ectopic pregnancies in the tube⁵. Laparoscopic removal of a pregnancy in a rudimentary horn is deemed safe, particularly for early, unruptured pregnancies¹². Nonetheless, thorough preoperative evaluation, including assessments for potential urinary tract abnormalities, is essential to minimize the likelihood of complications¹³.

Recent advances in diagnostic imaging techniques, such as three-dimensional (3D) ultrasound and magnetic resonance imaging (MRI), have revolutionized the diagnosis of rudimentary horn pregnancies, enabling early detection and timely intervention. While medical termination using methotrexate may be effective in stable cases, surgical intervention remains the cornerstone of treatment, especially in unstable patients. Early recognition of pregnancy in a rudimentary horn is crucial for preventing maternal morbidity and mortality.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ETHICAL APPROVAL

The Ethics Committee of Aga Khan University Hospital, Karachi, Pakistan has approved the study.

PATIENT CONSENT

The patient and family have been informed regarding the study and written consent has been taken.

AUTHORS CONTRIBUTIONS

FA – Conceptualization, Data curation, and writing the original draft. HSH – Writing original draft and validation. SH – Reviewing and editing of the draft. WM – Data curation. IA - Conceptualization, Data curation, Reviewing and editing of draft, and Supervision.

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