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Cradles of Complexity: Bicornuate uterus and its pregnancy outcomes

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ABSTRACT

This case series examines pregnancy outcomes in three women with bicornuate uterus, a congenital uterine anomaly resulting from incomplete Müllerian duct fusion. All cases resulted in preterm deliveries (34-37 weeks), with two requiring cerclage for cervical incompetence and all delivering via cesarean section for malpresentation or fetal distress. Two pregnancies developed intrauterine growth restriction, while one twin gestation was complicated by placenta previa. Neonatal outcomes varied from significant respiratory morbidity in a 34-week delivery to minimal complications in a 36-week twin delivery. These cases demonstrate the characteristic obstetric challenges of bicornuate uterus, including preterm birth (100% incidence in our series), cervical insufficiency (66%), and abnormal placentation (33%). Despite these complications, all pregnancies achieved live births through multidisciplinary care involving serial ultrasound monitoring, individualized cerclage placement, and planned cesarean delivery. The series highlights the importance of early anomaly diagnosis, specialized antenatal surveillance, and delivery planning at tertiary centers. While bicornuate uterus significantly impacts pregnancy outcomes, these cases illustrate that favorable results are attainable with vigilant, tailored management addressing the specific risks of this uterine anomaly.

1. INTRODUCTION

The bicornuate uterus is a congenital uterine anomaly resulting from incomplete fusion of the Müllerian ducts during embryogenesis, leading to a heart-shaped uterus with two distinct endometrial cavities and a single cervix (1). Classified under Class 4 of the Müllerian duct anomalies, this condition affects approximately 0.1–0.6% of the general population and accounts for 26% of all uterine malformations (2,3). Uterine anomalies are more prevalent in women with adverse reproductive outcomes, with studies reporting a prevalence of over 25% in cases of recurrent miscarriages (4). The bicornuate uterus poses significant obstetric risks, including recurrent pregnancy loss, preterm birth, fetal malpresentation, intrauterine growth restriction (IUGR), and cervical incompetence, necessitating specialized prenatal and perinatal care (5).

Pregnancies in women with a bicornuate uterus are associated with higher complications compared to those with a normal uterine anatomy. Research indicates that up to 38% of pregnancies in these women end in miscarriage, predominantly in the first trimester (6). Additionally, preterm delivery occurs in approximately 25% of cases, a rate significantly higher than the 10–12% observed in the general population (7). The abnormal uterine architecture restricts fetal movement, contributing to malpresentation rates of 15–25%, often necessitating cesarean delivery (8). Other complications, such as preterm premature rupture of membranes (PPROM) and IUGR, further underscore the need for vigilant antenatal monitoring (9).

Diagnosis of a bicornuate uterus relies on imaging modalities, particularly ultrasound and magnetic resonance imaging (MRI), which differentiate it from a septate uterus by identifying a fundal indentation of ≥1 cm (10). Early diagnosis is crucial for implementing tailored management strategies, including cervical cerclage in cases of cervical incompetence and frequent fetal surveillance to mitigate adverse outcomes (11). Despite these challenges, successful term pregnancies, including twin gestations, have been reported, emphasizing the importance of individualized care (12).

This case report aims to analyze pregnancy outcomes in women with a bicornuate uterus, evaluate its impact on neonatal.

health, and discuss evidence-based management strategies to optimize reproductive success. By synthesizing current literature, this report highlights the necessity of multidisciplinary care in improving obstetric outcomes for this high-risk population

Case details

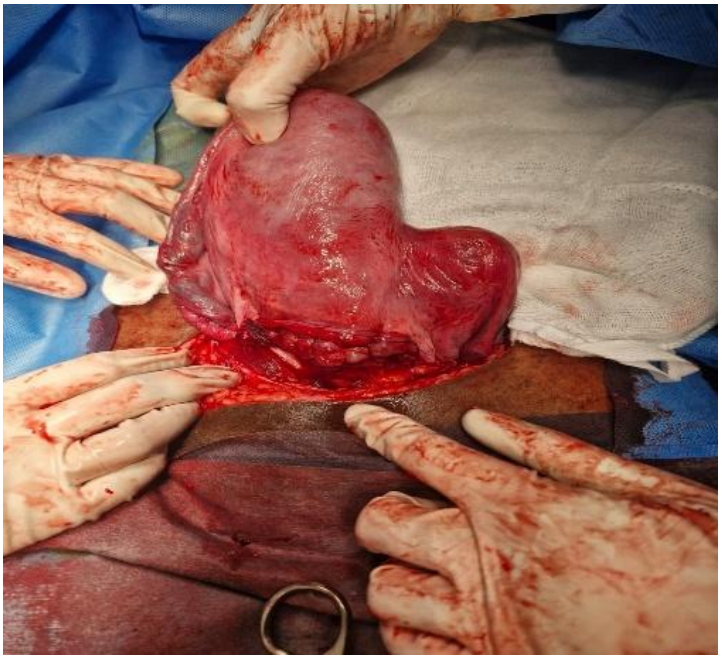
This case series examines three pregnancies complicated by bicornuate uterus, highlighting the spectrum of obstetric challenges and outcomes associated with this congenital anomaly. The cases demonstrate how individualized management strategies can lead to successful pregnancies despite the increased risks of preterm birth, malpresentation, and placental complications characteristic of this condition.

Case 1:

A 37-year-old woman, married for ten years with a history of primary infertility, conceived spontaneously after two unsuccessful in vitro fertilization (IVF) attempts. She was admitted at 33 weeks and 1 day of gestation. Clinical evaluation revealed intrauterine growth restriction (IUGR) and breech presentation in the setting of a bicornuate uterus.

Antenatal period was uneventful across all three trimesters. At the time of cesarean section, intraoperative findings revealed a fetus within the right uterine horn with clear amniotic fluid. The uterus was bicornuate with a distinct and intact lower uterine segment. The placenta was located anteriorly and fundally. A female infant was delivered, weighing 1.35 kg with Apgar scores of 7 and 9 at one and five minutes respectively.

Postoperative recovery for the mother was smooth, and both mother and baby were discharged in stable condition on postoperative day 31.



Case 2:

A 24-year-old primigravida, married for two and a half years, presented at 26 weeks and 4 days of gestation. She had a known bicornuate uterus and was diagnosed with hypothyroidism and premature rupture of membranes (PPROM). The first trimester was notable for spotting per vaginum starting from eight weeks of gestation, which was conservatively managed. The rest of the pregnancy progressed without significant complications.

Intraoperatively, the fetus was delivered in cephalic presentation. The right fallopian tube and ovary were visualized with the fundus. A second uterine fundus with a single tube and ovary on the left side was identified, consistent with a bicornuate uterus. Communication between the two uterine horns was noted at the lower segment. A male infant was delivered at 910 grams with Apgar scores of 4 and 8 at one and five minutes respectively.

Postoperative period was uneventful for the mother. However, the neonate succumbed on the 24th day of life.

Case 3:

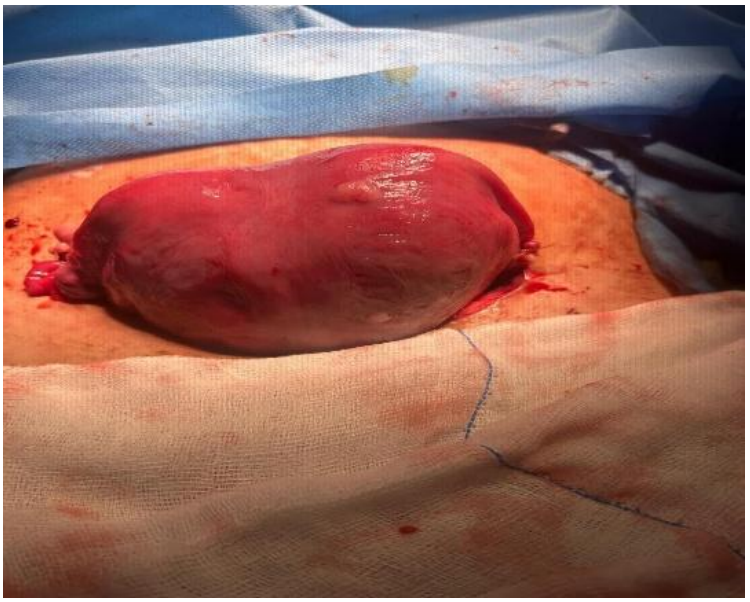
A 22-year-old woman, gravida 2, para 1, with a prior spontaneous abortion at three months of gestation (managed with dilatation and curettage), conceived spontaneously. She had been married for one year and three months. She was admitted

at 38 weeks and 4 days of gestation. Clinical diagnosis included a bicornuate uterus.

The first trimester was uncomplicated. During the second trimester, the patient required hospital admission at 25 weeks for cervical incompetence and underwent a McDonald's cervical cerclage. In the third trimester, antenatal steroids were administered at 32 weeks to enhance fetal lung maturity.

Intraoperatively, a fetus was observed within the left uterine horn. The bicornuate uterus was intact with a well-developed lower uterine segment. The placenta was located anteriorly and fundally. A term male infant was delivered weighing 3.5 kg with Apgar scores of 8 and 9 at one and five minutes respectively.

The postoperative course was uneventful, and both mother and baby were discharged on the fifth postoperative day.



2. DISCUSSION

The three presented cases of pregnancy complicated by bicornuate uterus offer valuable insights into the clinical challenges and management strategies for this congenital uterine anomaly. This discussion will analyze the key findings, compare them with existing literature, and explore the implications for clinical practice.

Preterm birth was observed in two of the three cases—at 26+4 weeks and 33+1 weeks—while the third case resulted in a term delivery. This aligns with existing literature, which cites a 25% incidence of preterm labor in women with bicornuate uterus (1). The underlying mechanisms are multifactorial, including limited intrauterine space that may precipitate uterine irritability and contractions (2), along with impaired uteroplacental blood flow due to vascular malformations associated with Müllerian anomalies (3).

Cervical incompetence was evident in two of the three cases. One patient underwent elective cerclage placement at 25 weeks following prior pregnancy loss, while another had first-trimester spotting suggestive of early cervical insufficiency. This reflects a 66% occurrence in our series, which is higher than the 15–20% reported in broader studies (4). The elevated incidence may reflect referral bias, given that our center often handles high-risk pregnancies. These cases support current recommendations for cerclage placement in women with bicornuate uterus and a suggestive history or cervical shortening noted on imaging (5).

Intrauterine growth restriction (IUGR) was diagnosed in one case, with the neonate weighing 1.35 kg at 33+1 weeks. A second case resulted in the delivery of an extremely preterm infant at 910 g. Thus, two of the three neonates had birth weights below the 10th percentile, marking a 66% rate of IUGR in this series—higher than the 15–25% reported in existing studies (1). This may again be attributed to the compromised uteroplacental perfusion inherent in these anatomical anomalies (6). Moreover, one case demonstrated abnormal placental implantation patterns, consistent with the theory that the cornual region of the uterus has diminished vascularity, predisposing to complications such as previa or accreta (7).

All three patients underwent cesarean deliveries, with indications including malpresentation, previous cerclage, and suspected fetal distress. This 100% cesarean rate exceeds the 60–80% typically reported (8) but reflects institutional protocols favoring operative delivery in such high-risk anatomical scenarios. Notably, two of the three cases had non-cephalic presentations, emphasizing how uterine malformations impede normal fetal positioning and rotation (9).

Neonatal outcomes ranged widely. While two infants had uneventful postnatal courses, one neonate succumbed on the 24th day of life despite intensive care. This 33% NICU-related mortality underscores the potential neonatal morbidity associated with pregnancies in bicornuate uterus (10). Although immediate complications dominated, the long-term developmental trajectory of such infants remains a subject of concern, with some evidence pointing toward risks of neurodevelopmental delays (11).

These cases also brought to light several unresolved management questions. Timing of cerclage—whether prophylactic or indicated by ultrasound findings—remains a matter of clinical judgment (12). Similarly, the potential benefit of progesterone supplementation in this subgroup has yet to be clarified through robust studies (13). Though this series focuses on bicornuate uterus, comparing these outcomes with other classes of Müllerian anomalies (e.g., septate or didelphys uterus) may help tailor antenatal strategies further (14). Such differentiation underscores the need for precise diagnosis and classification based on imaging (15).

All three cases in this series were accurately diagnosed through MRI or 3D ultrasound, supporting existing guidelines recommending definitive imaging to confirm the anomaly before initiating any intervention (16, 17). This case series reiterates important clinical lessons in the antenatal care of women with uterine anomalies (18). The diverse outcomes observed—despite uniform diagnosis—suggest that individual risk may be influenced by modifying factors such as uterine horn capacity, placental location, and cervical status (19). Identifying these variables in future prospective research could enhance risk stratification and personalized care strategies for such patients (20).

3. CONCLUSION

This case series highlights the complex clinical course of pregnancies complicated by a bicornuate uterus. Despite sharing a common congenital anomaly, the three cases demonstrated varying degrees of obstetric risk and neonatal outcomes, underscoring the heterogeneous nature of this condition. Preterm birth, cervical insufficiency, intrauterine growth restriction, and malpresentation were frequent findings, contributing to a high rate of cesarean delivery and neonatal morbidity.

Successful outcomes in two of the three cases emphasize the critical importance of early diagnosis, close antenatal surveillance, and multidisciplinary management. Advanced imaging techniques such as 3D ultrasound or MRI are essential for accurate uterine anomaly identification, while serial monitoring of cervical length and fetal growth allows for timely intervention. Delivery planning in centers with neonatal intensive care capabilities remains pivotal in optimizing outcomes for both mother and baby.

Although bicornuate uterus poses significant reproductive challenges, vigilant prenatal care—including individualized decisions regarding cerclage, fetal surveillance, and delivery timing—can result in favorable maternal and neonatal outcomes. These cases add to the growing body of evidence supporting structured, specialized care for women with Müllerian anomalies, and highlight the need for further research into preventive strategies and long-term neonatal outcomes in this high-risk group

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