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Case Series

A case series on uterine anomalies and their obstetric outcomes

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ABSTRACT

Congenital uterine anomalies (CUAs) are structural malformations of the female reproductive tract resulting from disruptions in the embryological development of the Müllerian ducts. These anomalies may remain undetected due to their asymptomatic nature but can significantly affect reproductive outcomes, including infertility, recurrent pregnancy loss, and complications during gestation and delivery. This case series presents five patients diagnosed with different types of uterine anomalies unicornuate, bicornuate, didelphys and septate uterus—each demonstrating distinct antenatal and postnatal trajectories. The series highlights the importance of accurate diagnosis, individualized management strategies, and multidisciplinary care to optimize maternal and neonatal outcomes.

Keywords: Congenital uterine anomalies, Müllerian anomalies, Unicornuate uterus, Bicornuate uterus, Uterus didelphys, Septate uterus, Antenatal complications, Postnatal outcomes, Case series

INTRODUCTION

Congenital uterine anomalies (CUAs) arise due to incomplete or abnormal development, fusion, or resorption of the paired Müllerian ducts during embryogenesis.[1,2] These anomalies are estimated to affect 4 to 7 percentage of women in the general population but are disproportionately represented approximately 13 percent among those experiencing infertility and 24 to 38 percent in recurrent pregnancy loss.[3,4] The uterus, fallopian tubes, cervix, and upper vagina originate from the Müllerian ducts, and any interruption in their development can result in a wide spectrum of structural abnormalities.[5,6]

The classification of CUAs includes several distinct types, each with unique anatomical and clinical implications (Figure 1).[7]

Unicornuate uterus results from agenesis or hypoplasia of one Müllerian duct, often accompanied by a rudimentary horn.

Bicornuate uterus occurs due to partial failure of fusion between the ducts, leading to a uterus with two horns.

Uterus didelphys is characterized by complete failure of fusion, resulting in two separate uterine cavities and often two cervices.

Septate uterus is caused by incomplete resorption of the central septum, dividing the uterine cavity.

Arcuate uterus represents a mild indentation of the uterine fundus and is considered a minor anomaly.[8,9]

These anomalies can lead to a range of reproductive complications, including miscarriage, preterm labor, fetal growth restriction, abnormal fetal presentations, and increased likelihood of caesarean delivery.[6,10] Renal anomalies of about 20-40% are frequently associated, particularly in cases involving unicornuate uterus, due to the shared embryological origin of the urinary and reproductive systems.[11]

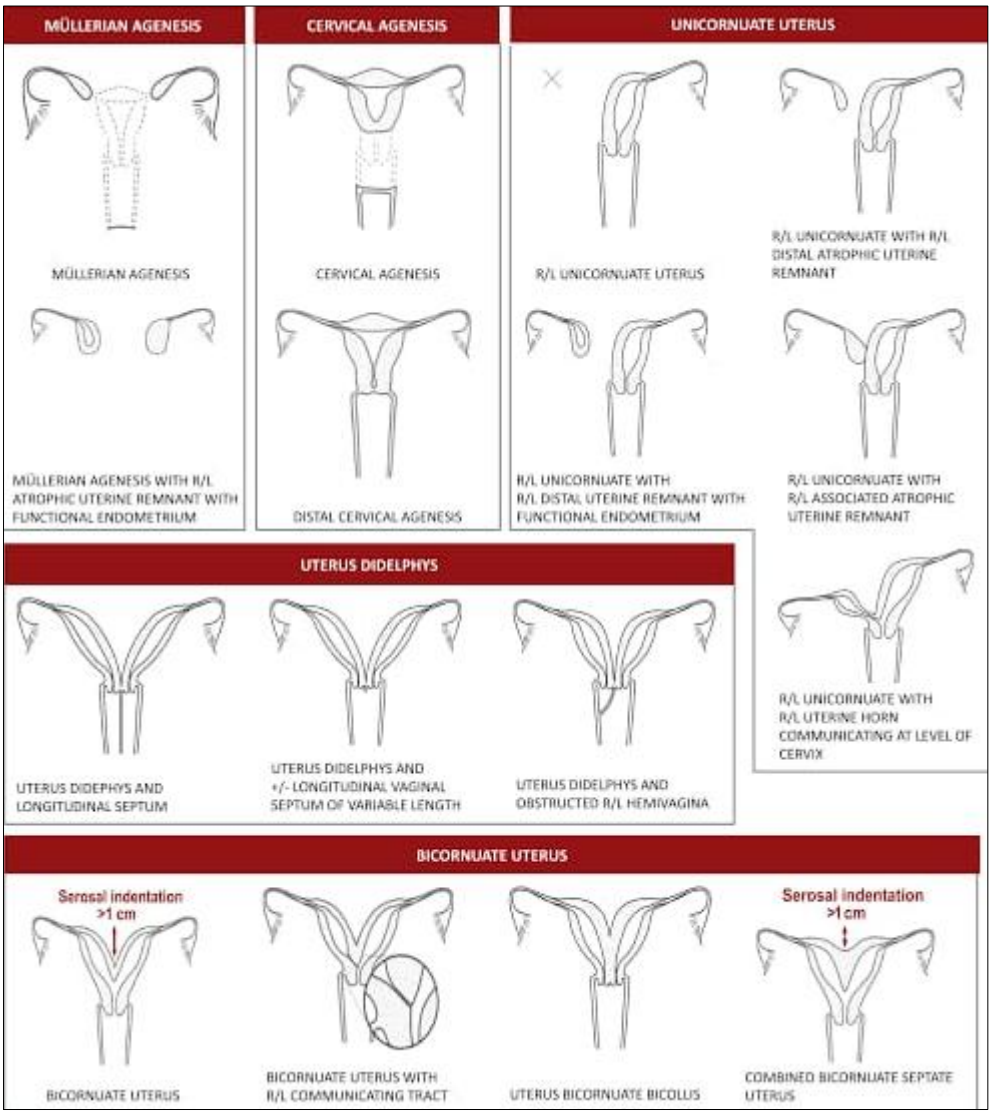

Figure 1: ASRM Müllerian anomalies classification.

Accurate diagnosis is essential and typically involves advanced imaging techniques such as three-dimensional transvaginal ultrasound and magnetic resonance imaging (MRI), which provide detailed visualization of uterine anatomy.[8,10] Hysteroscopy and laparoscopy serve both diagnostic and therapeutic roles, particularly in cases requiring surgical correction. Management strategies must be tailored to the specific anomaly, the patient's reproductive goals, and the associated risks.[1,6]

CASE SERIES

Case 1: Unicornuate uterus with non-communicating rudimentary horn and ectopic pregnancy

A 22-year-old primigravida presented with acute lower abdominal pain and vaginal spotting at six weeks of gestation. Initial transvaginal ultrasound revealed a gestational sac located in a structure separate from the main uterine cavity. MRI confirmed the presence of a unicornuate uterus with a non-communicating rudimentary horn. Laparotomy revealed an ectopic pregnancy within the rudimentary horn, which was surgically excised along with the ipsilateral fallopian tube. Histopathological examination confirmed the presence of chorionic villi. Renal ultrasound revealed agenesis of the kidney on the same side as the rudimentary horn.

This case illustrates the high risk of rupture associated with pregnancies in non-communicating rudimentary horns, often occurring in the first trimester. Surgical excision is the definitive management to prevent life-threatening complications.

Case 2: Unicornuate uterus with a communicating rudimentary horn till term pregnancy

A 26-year-old primigravida at 37 weeks of gestation presented with complaints of leaking per vaginum for 3 hours. Due to non-progression of labor, she was taken up for emergency lower segment caesarean section (LSCS). Intraoperatively, a unicornuate uterus with a

communicating rudimentary horn was identified. The fetus was delivered from the unicornuate segment, and the rudimentary horn was structurally integrated but anatomically distinct.

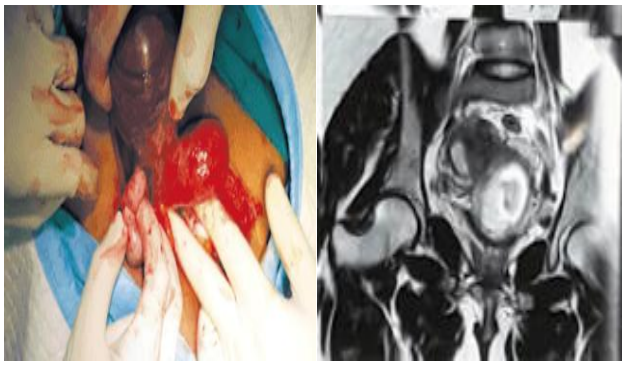

Figure 2: Intra-op and MRI image of unicornuate uterus with non-communicating rudimentary horn.

This case underscores the possibility of a near-normal antenatal course in patients with Müllerian anomalies and highlights the importance of intrapartum vigilance. Despite the anomaly, the pregnancy progressed to term without major complications; however, labor dysfunction necessitated surgical delivery, emphasizing the need for individualized obstetric management in such cases.

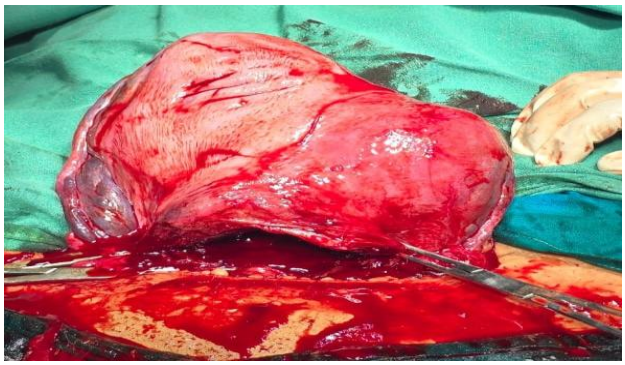

Figure 3: An intra-op image of unicornuate uterus.

Case 3: Complete bicornuate uterus with term delivery

A 28-year-old woman with a history of two previous first-trimester miscarriages on evaluation was diagnosed with bicornate uterus on HSG and Ultrasound she conceived spontaneously at 7 weeks of gestation USG revealed a bicornuate uterus with a viable intrauterine pregnancy located in the left horn. The patient was managed with progesterone supplementation throughout pregnancy and underwent regular antenatal monitoring. At 38 weeks, she underwent an elective caesarean section due to breech presentation. Intraoperative findings confirmed a complete bicornuate uterus with a deep fundal cleft separating the two horns.

This case highlights the association between bicornuate uterus and malpresentation, as well as the increased likelihood of caesarean delivery due to anatomical constraints. Progesterone support and close monitoring contributed to a favourable outcome.

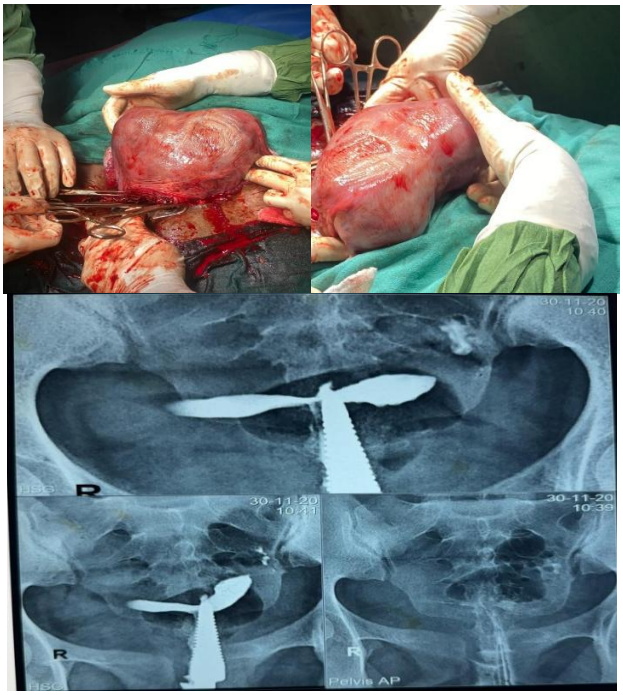

Figure 4: Intra-op image and X-ray hysterosalpingogram of complete bicornuate uterus.

Case 4: Uterus didelphys with recurrent pregnancy loss

A 30-year-old woman with a history of five spontaneous abortions presented at eight weeks of gestation. Three-dimensional ultrasound revealed uterus didelphys with a gestational sac in the left horn. The patient had two distinct uterine cavities and two cervices. She was managed with cervical cerclage to address cervical incompetence and received progesterone therapy throughout pregnancy. At 36 weeks, she delivered a healthy neonate via caesarean section.

This case underscores the importance of recognizing uterus didelphys in patients with recurrent pregnancy loss. The use of cerclage and hormonal support can improve pregnancy outcomes in cases complicated by cervical insufficiency.

Case 5: Septate uterus with recurrent miscarriages and surgical correction

A 25-year-old woman with two prior miscarriages married for 5 years underwent evaluation for infertility. Imaging studies, including three-dimensional ultrasound and hysteroscopy, confirmed a complete septate uterus. She underwent hysteroscopic metroplasty to resect the septum. Six months post-surgery, she conceived spontaneously and carried the pregnancy to term. Delivery was performed via caesarean section due to non-progressive labor.

This case demonstrates the effectiveness of surgical correction in improving reproductive outcomes for women with septate uterus. Metroplasty significantly reduces miscarriage rates and enhances the likelihood of successful pregnancy.

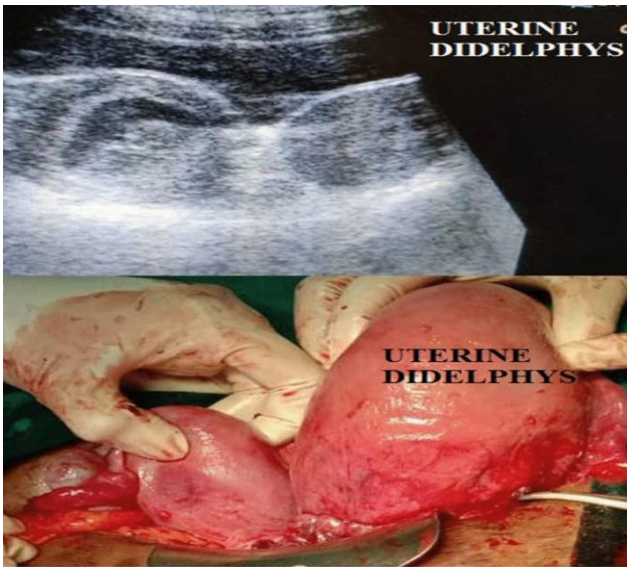

Figure 5: Intra-op and USG image showing uterus didelphys.

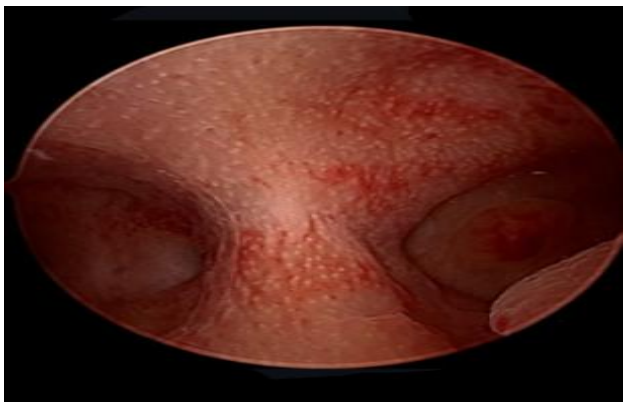

Figure 6: Hysteroscopic image of septate uterus.

Clinical relevance

Congenital uterine anomalies, though often underdiagnosed, have substantial implications for reproductive health. Their impact spans conception, gestation, and delivery, necessitating a comprehensive and individualized approach to care. Key clinical considerations include the following.

Infertility and recurrent miscarriage

Most commonly associated with septate and didelphys uterus due to poor endometrial receptivity and structural barriers to implantation. These conditions have a good reproductive outcome after surgical correction.

Preterm labor and fetal growth restriction

Frequently observed in bicornuate uterus due to reduced uterine volume and altered vascular supply.

Malpresentation and caesarean delivery

Common in bicornuate and unicornuate uterus due to asymmetrical uterine cavities.

Ectopic pregnancy and uterine rupture

Particularly concerning in cases involving rudimentary horns, which lack adequate musculature and vascular support.

Diagnostic modalities

Three-dimensional ultrasound and MRI provide high-resolution images for accurate classification.

Hysteroscopy and laparoscopy are essential for both definitive diagnosis and surgical correction.

Renal imaging is recommended in cases of unicornuate uterus due to frequent coexisting renal anomalies.

Management strategies

Hysteroscopic metroplasty is the treatment of choice for septate uterus.

Cervical cerclage and progesterone therapy are beneficial in bicornuate and didelphys uterus to prevent preterm labor and reduce perinatal morbidity and mortality.

Surgical excision of rudimentary horns is necessary to prevent rupture and manage ectopic pregnancies.

Multidisciplinary care, involving obstetricians, radiologists, Neonatologist, and reproductive specialists, is critical for optimizing outcomes.

DISCUSSION

We described different appearances and course of the cases with CUA and their reproductive effects in our current case series. The main findings indicate that septate and bicornuate uterus were frequently associated with infertility and recurrent pregnancy loss and that unicornuate uterus was frequently associated with malpresentation and unfavourable obstetric outcomes. These findings are consistent with earlier research which has shown that CUAs, which are relatively rare in the general population, are highly prevalent among women with infertility and recurrent miscarriage.[1,3,10]

Many large cohorts have shown that the septate uterus has the highest risk of miscarriage resulting from defective

endometrial receptivity and hypovascularization.[10,11] In agreement with this, those in our series with septate uterus reported a history of recurrent early pregnancy loss, the results of which, however, may be improved upon surgical repair by means of hysteroscopic metroplasty, as previously reported in the literature.[4,8] On the other hand, bicornuate uterus in our series carried risk for preterm labor and malpresentation, in line with previous studies which explained poor obstetric performance because of low volume of uterine cavity and deviation of myometrial compliance.[1,6]

Unicornuate uterus, which is less common, had more severe reproductive implications in our patients, especially with rudimentary horn. This is in agreement with Tellum et al who described significantly more miscarriages, preterm birth or caesarean delivery in women with a unicornuate uterus as compared to the population.[10] Likewise, Li et al showed that smaller uterine size was associated with fetal growth restriction and preterm birth in unicornuate uterus.[11] Our findings support these reports and indicate the significance of early diagnosis and intervention.

In terms of management, the results of our case highlighted the necessity of personalized and interdisciplinary management. Hysteroscopic septal resection, resection of rudimentary horns and prevention measures, such as cervical cerclage in bicornuate uterus, were correlated to improve reproductive outcome, as recommended in the literature.[2,9] In addition, it may be useful to perform routine renal imaging in unicornuate cases, given that 20–40% of CUAs are associated with renal anomalies.[5]

CONCLUSION

Congenital uterine anomalies represent a diverse group of structural malformations with significant reproductive implications. Early and accurate diagnosis, combined with individualized management and vigilant antenatal care, is essential for improving maternal and neonatal outcomes. This case series highlights the varied presentations and clinical challenges associated with CUAs and reinforces the importance of a multidisciplinary approach. Future research should focus on long-term reproductive outcomes and the refinement of minimally invasive surgical techniques to enhance fertility and pregnancy success in affected women.

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