Placental Abruption in a Bicornuate Uterus with Associated Placental Accreta

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Background – Uterine anomalies likely affect the arrangement of the uterine myometrium, available space for fetal growth and ability to distend and therefore the progression of pregnancy.[1] Rates of pre-labour rupture of membranes (PROM), placental abruption, and IUGR are associated with congenital uterine anomalies[2] and may contribute to uterine rupture depending on the specific type of uterine variation[1]. There has been demonstration of up to 8% uterine rupture in women who attempt vaginal birth after a cesarean delivery (VBAC) with background Mullerian duct anomalies however the specific relationship between uterine anomalies and uterine rupture is not well described. 2D transvaginal US (TVS) has been the first line imaging modality to diagnose suspected uterine structural variations however may only have a sensitivity of 60%.[3] Transvaginal 3D US is emerging as a preferable alternative with sensitivity rates up to 96.7% with the additional advantages of being accessible, cost-effective and of a less invasive nature than alternate imaging.[3] Ultrasonographic markers also have an important role in early recognition of accreta spectrum features. Placeta accreta is secondary to an unusual myometrial environment of which a placenta develops leading to abnormal decidualization and abnormally deep placental anchoring villi and trophoblast infiltration which may occur in uterine structural pathology such as a bicornuate uterus.[4] Sonographic features of placenta accreta can include myometrial thinning, placental lacunae, loss of the uteroplacental interface, placental bulge, sub-placental and/or uterovesicle hypervascularity etc.[4]

Case – AB is a 34 year old with a history of previous ectopic pregnancy and two early miscarriages which were managed with surgical dilatation and curettage. She had a previous preterm pre-labour rupture of membranes (PPROM) at 31 weeks followed by emergency cesarean section at 32 weeks for fetal footling breech presentation. An early morphology scan for this pregnancy demonstrated normal fetal anatomy for DCDA twins and prominent maternal vessels seen in the lower uterine segment. At 19 weeks, she presented with sharp and cramping abdominal pain which had been increasing in severity for three weeks. She had a normal abdominal and obstetric assessment and pathology. The pain resolved overnight with adequate analgesia. She received a formal ultrasound the next day which again demonstrated prominent maternal vessels in the cervical region and which was otherwise unremarkable. A week later, AB presented with sudden onset abdominal, back, shoulder and chest pain in clinical hypovolaemic shock requiring a metaraminol infusion. A bedside focused assessment with sonography for trauma (FAST) scan demonstrated free fluid in both the peri-hepatic and peri-splenic regions. Her Hb was 102 g/L from a recent level of 120 g/L and a massive transfusion protocol was initiated.

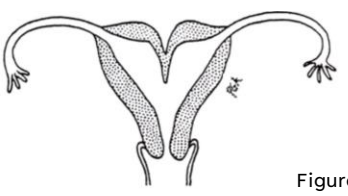

Figure 1a

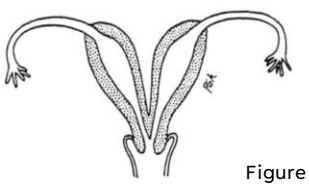

Figure 1b

Figure 1a diagram of partial bicornuate uterus[5]
Figure 1b diagram of complete bicornuate uterus (division to internal os)[5]

Clinical course – Once stabilised, AB underwent a CT angiogram which was indicative of intra-abdominal bleeding. She was transferred for an emergency lapartomy. Intra-operatively, a bicornuate uterus was discovered with abnormal placentation in the left uterine horn in the cornea with a rupture approximately 5-6cm. Placental tissue was identified in the serosa and suggestive of placenta accreta. The first twin was intrauterine and the second twin was identified in the abdomen on delivery. Haemostasis and uterine contraction was achieved following closure of the apices in two layers, the left broad ligament, and with anterior to posterior sutures over the placental bed. A hematoma in the uterine-ovarian ligament was oversewn and a blade drain to the Pouch of Douglas was inserted with estimated blood loss of 5000ml. At this pre-viable age, the twins died shortly after. Post-operatively, AB was monitored in the ICU. Social work was immediately involved for psychosocial support which was continually offered until her follow up in the Perinatal Loss Clinic.

Discussion - In order to utilize reliable diagnostic resources women with risk factors in the family planning and antenatal period need to be identified in order to be properly counselled and have appropriate investigations and monitoring. The case of AB highlights the necessity of earlier recognition of risk factors for loss of pregnancy. Further research and guidelines need to be established in identifying women with risk factors and how to streamline diagnostic investigations and adequate antenatal care. This case demonstrates an unfortunate convocation of multiple rare complications and abnormalities of pregnancy. Despite AB's case being an outlier in many respects, the case still remains that she has had numerous gynaecological and obstetric investigations, each of which may have presented an opportunity for identification and diagnosis. While further research into the epidemiology and prognosis of uterine abnormalities takes place, this case raises the further question of the adequacy of existing screening processes, whilst acknowledging the relatively low incident of significant uterine abnormality. Furthermore, considering the limitations of intervention for such uterine anomalies, perhaps screening is not currently justified however counselling patients of their risk and preparing them for potential adverse outcomes constitutes a core component of medical responsibility to duty of care.

Learning Points

- ❖ **3D transvaginal US is an accurate imaging modality to recognize structural variations in congenital uterine abnormalities**
- ❖ **Specific placenta accreta characteristics have also been identified on US imaging**
- ❖ **Guidelines in recognizing women with congenital uterine variances as well as women with risk factors for placenta accreta need further development in order to appropriately counsel women of risks and for adequate antenatal monitoring and investigations**

References

1. Kim MA, Kim HS, Kim YH. Reproductive, Obstetric and Neonatal Outcomes in Women with Congenital Uterine Anomalies: A Systematic Review and Meta-Analysis. J Clin Med. 2021 Oct 20;10(21):4797. doi: 10.3390/jcm10214797. PMID: 34768344; PMCID: PMC8584292.
2. Hosseinirad H, Yadegari P, Falahieh FM, Shahrestanaki JK, Karimi B, Afsharzadeh N, Sadeghi Y. The impact of congenital uterine abnormalities on pregnancy and fertility: a literature review. JBRA Assist Reprod. 2021 Oct 4;25(4):608-616. doi: 10.5935/1518-0557.20210021. PMID: 34224238; PMCID: PMC8489822.
3. Vaz SA, Dotters-Katz SK, Kuller JA. Diagnosis and Management of Congenital Uterine Anomalies in Pregnancy. Obstet Gynecol Surv. 2017 Mar;72(3):194-201. doi: 10.1097/OGX.0000000000000408. PMID: 28304417.
4. Jauniaux E, Collins S, Burton GJ. Placenta accreta spectrum: pathophysiology and evidence-based anatomy for prenatal ultrasound imaging. Am J Obstet Gynecol. 2018 Jan;218(1):75-87. doi: 10.1016/j.ajog.2017.05.067. Epub 2017 Jun 24. PMID: 28599899.
5. Pediatric and Adolescent Gynecology, 6th ed, Emans SJ, Laufer MR (Eds), Lippincott Williams & Wilkins, Philadelphia 2012. Copyright © 2012 Lippincott Williams & Wilkins.