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Case Report

Immediate Postpartum Hemorrhage in an Arcuate Uterus: A Case Report of Asymmetric Uterine Atony

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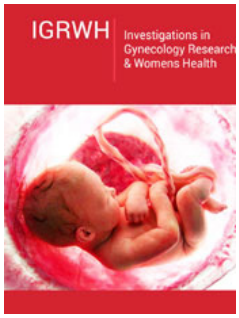

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Abstract

Background: An arcuate uterus is a minor congenital uterine anomaly that is often considered clinically insignificant. However, non-uniform myometrial contractility may occasionally predispose to obstetric complications, including postpartum hemorrhage (PPH).

Case presentation: A 26-year-old primiparous woman had an arcuate uterus incidentally identified on fetal MRI. She delivered vaginally at 39+2 weeks. Immediately after placental delivery, she developed heavy bleeding (~1200mL) despite an apparently satisfactory uterine tone on abdominal palpation (uterine globe). Bedside ultrasound excluded retained products and suggested asymmetric fundal hypocontractility at the site of the fundal indentation. After initial medical management (uterine massage, uterotonics, tranexamic acid) and mechanical measures, bleeding persisted and she was transferred to the operating room. Uterus-sparing surgery with stepwise uterine devascularization (Tsirulnikov ligatures) combined with a B-Lynch compression suture achieved hemostasis.

Conclusion: A clinically "good" uterine globe can be misleading in PPH. When examination findings and bleeding are discordant, a structured 4Ts assessment and bedside ultrasound may expedite diagnosis of segmental/asymmetric atony and guide timely escalation to conservative interventions.

Keywords: Arcuate uterus; Postpartum hemorrhage; Uterine globe; Asymmetric uterine atony; Uterotonic agents; Bakri balloon; B-Lynch; Tsirulnikov; Bedside ultrasound

Abbreviations: ASRM: American Society for Reproductive Medicine; EBL: Estimated Blood Loss; ESGE: European Society for Gynaecological Endoscopy; ESHRE: European Society of Human Reproduction and Embryology; MRI: Magnetic Resonance Imaging; NB: Newborn; PROM: Prelabor Rupture of Membranes; GA: Gestational Age; HR: Heart Rate; PPH: Postpartum Hemorrhage; TXA: Tranexamic Acid; 4Ts: Tone, Trauma, Tissue, Thrombin

Introduction

Müllerian anomalies (congenital anomalies of the female genital tract) are classified by several systems, including the ASRM Müllerian Anomalies Classification 2021 (MAC2021) and the ESHRE/ESGE classification [1,2]. An arcuate uterus corresponds to a mild fundal indentation of the uterine cavity without a significant septum and is generally considered a minor anomaly/anatomic variant [1,3]. Available data suggest a possible increased risk of certain complications (malpresentation, preterm birth, cesarean delivery, and possibly postpartum hemorrhage), but findings remain heterogeneous depending on the definitions used [4,5]. Postpartum hemorrhage in an arcuate uterus is rarely described; a plausible pathophysiologic mechanism is non-uniform myometrial contractility leading to segmental/asymmetric uterine atony at placental delivery.

Case Presentation

Maternal characteristics

Ms B., 26 years old, primigravida (G1P0), with no notable gynecologic history, regular cycles, and a desired, well-followed pregnancy. The routine antenatal work-up was unremarkable.

Antenatal assessment

On the second-trimester anatomic ultrasound, suspected partial agenesis of the corpus callosum was raised, prompting fetal MRI at 28 weeks' gestation. MRI found no fetal abnormality and revealed an arcuate uterus. Fetal biometry was appropriate for gestational age (~22nd percentile) (Figure 1).

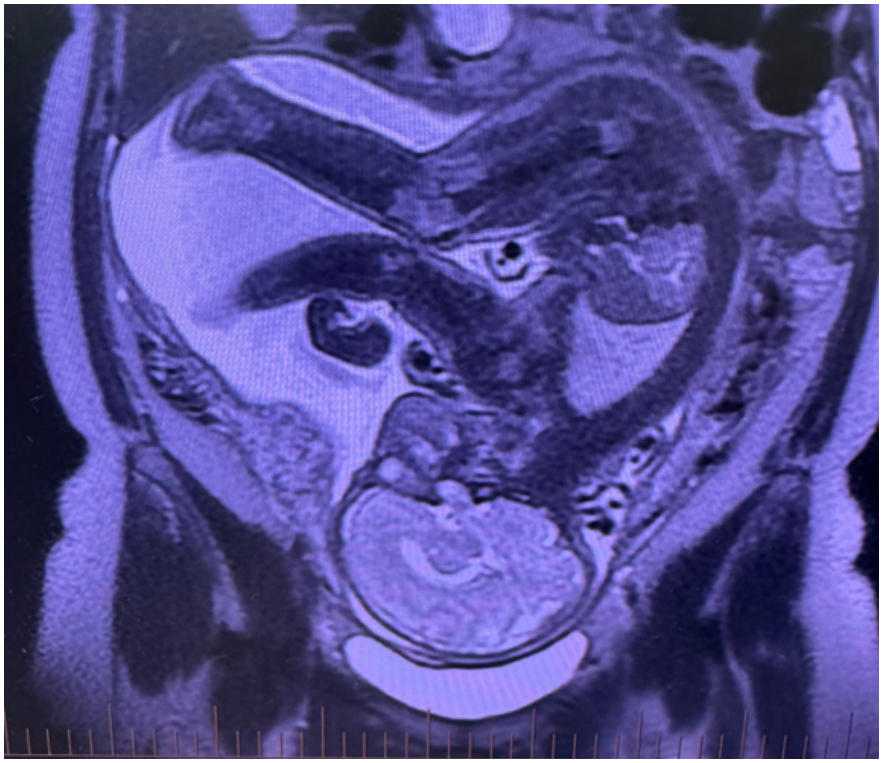

Figure 1: A coronal T2-weighted Foetal MRI sequence of the pelvis showing an arcuate uterus.

Labor and delivery

At 37 weeks + 5 days' gestation, the patient presented with prelabor rupture of membranes and early labor. Labor progressed uneventfully with timely cervical dilation and fetal descent. She delivered vaginally a eutrophic newborn with no immediate clinical abnormality.

Postpartum hemorrhage and clinical peculiarity

Immediately after placental delivery, postpartum hemorrhage occurred with an estimated blood loss of 1200mL; the patient remained hemodynamically stable (BP 112/75mmHg, HR 87bpm). The placenta was complete on inspection. A well-contracted uterine fundus (uterine globe) was palpated; despite this, bleeding persisted, emphasizing that satisfactory palpatory tone does not rule out postpartum hemorrhage and should not delay systematic etiologic evaluation [6-10].

Management and decision to proceed to the operating room

a) Immediate measures: Call for help, monitoring, two IV lines, labs (CBC, coagulation) and blood preparation as needed [6-10].

b) First-line maneuvers: Uterine massage±bimanual compression, bladder emptying [6-10].

c) Etiologic approach using the 4Ts: Cervico-vaginal/perineal inspection (Trauma), assessment for retained tissue (Tissue), tone assessment (Tone), and coagulation testing (Thrombin) [6-10].

d) Medical management per protocol: Uterotonics (first-line oxytocin) plus early TXA administration [6,8,9,11].

e) Bedside ultrasound when examination is discordant (uterine globe but persistent bleeding) to rule out retained products of conception and guide escalation [12,13].

f) Mechanical measure: Intrauterine balloon tamponade (Bakri-type) when available [8,10].

g) Ongoing bleeding despite these measures led to transfer to the operating room for examination under anesthesia and uterus-sparing hemostasis [6-10].

Uterus-sparing surgical hemostasis

After failure of initial measures, conservative surgery was performed, combining:

a) Progressive uterine devascularization using Tsirulnikov triple ligation [14,15].

b) B-Lynch uterine compression suture [16,17].

Hemostasis was achieved, avoiding hysterectomy. The postpartum course was uncomplicated.

Discussion

Types of uterine malformations and physiology of the arcuate uterus

The arcuate uterus is classified differently across systems (ASRM vs ESHRE/ESGE), which partly explains divergent findings in the literature [1,2]. Anatomically, it consists of a moderate fundal indentation without a significant septum [1,3]. In rare cases, non-uniform myometrial contractility may result in localized/segmental atony at placental delivery.

Complications of the arcuate uterus

Reported complications mainly include malpresentation, some dystocia, and adverse outcomes such as preterm birth or cesarean delivery, with results varying by study design and diagnostic criteria [4,5]. Postpartum hemorrhage appears possible but remains poorly documented and may relate to atypical uterine retraction dynamics.

Rapid management and special considerations

International and national guidelines emphasize immediate, structured, and stepwise management of postpartum hemorrhage with frequent reassessment [6-10]. The key message of this case is to avoid false reassurance from a firm uterine globe and to apply the 4Ts approach systematically.

Role of bedside ultrasound in the delivery room

With persistent bleeding or a discordant clinical exam, bedside pelvic ultrasound can help exclude retained products of conception, guide management, and accelerate therapeutic decisions [12,13].

Conclusion

Pregnancy in an arcuate uterus can progress to term with a healthy newborn. However, non-uniform uterine retraction may exceptionally be associated with postpartum hemorrhage. Vigilance at placental delivery, the 4Ts approach, and bedside ultrasound when the clinical exam is discordant are key elements [6-10,12,13].

Key Points/Learning Messages

a) A firm uterine globe does not exclude postpartum hemorrhage.

b) In postpartum hemorrhage, promptly apply a structured etiologic approach (4Ts) and reassess frequently.

c) Bedside ultrasound is useful when the clinical examination is discordant.

d) If initial measures fail, escalation to mechanical and then uterus-sparing surgical techniques should be rapid.

Highlights

a) An arcuate uterus may rarely be associated with segmental/asymmetric uterine atony and immediate PPH.

b) A palpably “good” uterine globe does not exclude significant bleeding—avoid false reassurance.

c) Bedside ultrasound can rapidly exclude retained tissue and support early escalation to uterus-sparing interventions.

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