

TITLE OF CASE

Accurate prenatal discrimination of Placenta Accreta Spectrum from uterine dehiscence is necessary to ensure optimal management

SUMMARY

Uterine scar dehiscence with underlying placenta is often misdiagnosed as placental accreta spectrum both prenatally and intraoperatively due to the absence of myometrial tissue in the area. Misdiagnosis generates obstetric anxiety and results in over – treatment which carries a risk of iatrogenic injury. We present a case of antenatal diagnosis of uterine dehiscence in a 36-year-old woman with a history of two previous caesarean deliveries and a low-lying placenta. We further describe the sonographic features useful for differentiating this condition from placental accreta spectrum in instances where the placenta lies under an area of full thickness uterine scar dehiscence.

BACKGROUND

Uterine scar dehiscence which is also referred to as “uterine window”, is a well-known complication of previous caesarean section with an incidence of 4.6% [1]. It occurs due to stretching of the scarred lower uterine segment in the third trimester. Differentiating uterine scar dehiscence from placenta accreta spectrum (PAS) in cases of placental previa is often challenging both prenatally and intraoperatively due to the absence of uterine myometrial tissue in the area. Making an accurate diagnosis and appropriate intrapartum management is vital in the case of PAS as attempted removal of the placenta can result in catastrophic haemorrhage with maternal mortality at the severe end of the spectrum being reported to be as high as 7% [2]. In view of this, uterine dehiscence misdiagnosed as PAS generates inappropriate obstetric anxiety and over-treatment (such as interventional radiology, vertical abdominal incision and hysterectomy) all of which carry risk of iatrogenic injury. In placenta previa with uterine scar dehiscence, the placenta spontaneously detaches from the uterus at caesarean delivery; there is no need for a classical uterine incision or hysterectomy, and blood loss is significantly lower, compared to placenta accreta spectrum (PAS) which is managed by a classical uterine incision during caesarean delivery [3], and may necessitate interventional radiology (IR) or surgical pelvic devascularisation to control haemorrhage[4]. There is therefore, a need to increase awareness of uterine dehiscence to avoid confusing this phenomenon with PAS to prevent unnecessary iatrogenic maternal morbidity. We present a case of prenatal diagnosis of uterine scar dehiscence with an anterior low-lying placenta.

A 36-year-old woman with a history of 2 previous caesarean deliveries and a mid-trimester anatomical survey indicating a low-lying placenta was referred to our centre for an ultrasound scan to rule out PAS. Ultrasound examination confirmed a low-lying placenta (1.8cm from the internal cervical os) at 32⁺³ weeks' gestation. Transvaginal ultrasound assessment of the lower uterine segment revealed an abnormally thin myometrium of about 0.4mm overlying the placenta. The placenta however, had a very homogenous echogenicity with no significant lacunae and the placental bed showed no evidence of hypervascularity. Due to the dilemma in the diagnosis, anonymous ultrasound images were sent to Professor Sally Collins for a second opinion. Based on imaging findings, a prenatal diagnosis of uterine scar dehiscence ("uterine window") with low lying placenta was made. In the meantime, 2 doses of betamethasone 12mg, 24 hours apart were administered for fetal lung maturation. She was counselled to report any symptoms of lower abdominal pain, vaginal bleeding, loss of fluid or reduced fetal movement. She was reviewed at 33 weeks' with no complaints. A follow up ultrasound scan at 34⁺⁶ weeks' revealed an area with undetectable myometrium spanning a length of 2.3cm (Figure 1). The patient reported severe lower abdominal pain during this ultrasound examination and so was admitted to the ward and counselled for a caesarean section. She was informed that caesarean hysterectomy would be performed in the event of uncontrolled post-partum haemorrhage or if the uterus could not be repaired. She was assessed by the anaesthesiologist and four units of blood were cross-matched ready for surgery the next day.

Caesarean delivery was performed through a transverse abdominal incision. Intraoperative findings revealed a large uterine scar dehiscence in the lower uterine segment spanning a length of 6cm with the placenta partly bulging through the defect with no evidence of neovascularization (Figure 2). A 1.86 kg healthy female was delivered, with Apgar score of 8 at 1 minute and 9 at 5 minutes. The new-born was assessed by the neonatologist and admitted to the neonatal intensive care unit. The placenta spontaneously detached without abnormal bleeding and the uterus was repaired in 2 layers, and haemostasis secured using vicryl suture. Estimated blood loss was 1100 mls, and 20 units of oxytocin in 0.5L normal saline, plus 800mcg misoprostol were administered to keep the uterus contracted. Bilateral tubal ligation was performed at the request of the patient. The recovery of the mother was uncomplicated; the wound healed by primary intention; her post-operative haemoglobin level was 9.1g/dl. The mother was discharged on post-delivery day 7, and stayed at the nursery until the neonate was discharged on post-delivery 14.

DISCUSSION

Uterine scar dehiscence is the incomplete separation of the uterine scar where the serosa remains intact with fetus, placenta and umbilical cord contained in the uterine cavity [5]. It occurs as the result of the progressive loss of scar integrity which leads to the gradual inward to outward separation of the uterine layers resulting from the stretching of the lower uterine segment in the third trimester [6]. This defect is considered to be a dehiscence as long as the serosa remains intact. The separation of serosa is termed a uterine rupture which is associated with the extrusion of uterine contents into the peritoneal cavity and can result in significant blood loss. Placenta accreta spectrum disorder (PAS), also called abnormally invasive placenta (AIP), describes a clinical situation where the placenta does not detach spontaneously after delivery and cannot be forcibly removed without causing massive and potentially life-threatening bleeding [7,8]. The exact pathophysiology is unclear, some suggest abnormal trophoblastic invasion through defective endometrium [7] while others argue for the trophoblastic attachment to defective decidua with progressive myometrial dehiscence with placental growth and pelvic adhesions [9]. Regardless of the diverse opinion on the pathophysiology of PAS, both theories agree that there is usually abnormal invasion of the trophoblast deep into the myometrium resulting in the presence of considerable neovascularization and extreme myometrial thinning.

Maternal and neonatal mortality and morbidity are reduced when PAS is diagnosed antenatally; as it gives an opportunity for essential preparations and precautions, including multidisciplinary team management, delivery timing and providing prophylactic medical and surgical interventions in a tertiary care hospital [10]. Although definitive diagnosis can only be made when the placenta fails to separate after delivery, antenatal imaging signs of PAS can be seen using ultrasound and Magnetic Resonance Imaging (MRI). The European Working Group on Abnormally Invasive Placenta (EW-AIP: now international society for PAS, IS-PAS) proposed standardized definitions of the AIP imaging descriptors, which has helped to increase diagnostic capabilities and facilitate international collaboration[11]. However, an issue in the prenatal diagnostic conundrum is the potential confusion between PAS and 'uterine window'. In such cases the placental tissue can be seen under the serosa at the time of caesarean section. The common sonographic finding in both conditions is the presence of an abnormally thinned myometrial tissue. In view of this, the presence of a placenta overlying the abnormally thinned myometrium could be easily misdiagnosed as PAS antenatally. The imaging signs found with uterine dehiscence include placental 'bulge', loss of the retroplacental clear or hypoechoic zone, imperceptible myometrium in the area of the placental bulge, but clearly visible, normal myometrium at both extremes of the 'bulge', creating the pathognomonic "uterine window". However, colour Doppler will not demonstrate any sub-placental, uterovesical hypervascularity, and intra-placental abnormal vascularity or lacunae typically seen in PAS. A clear distinction can also be made with uterine scar dehiscence by assessing the placental - bladder border which is smooth and regular compared to PAS which usually demonstrates bladder wall interruption and irregularity. Care must be taken though as abnormal adherence (accreta) often also presents with a fairly homogenous placenta and

absence of significant lacunae and hypervascularity [12] but as at this end of the placenta accreta spectrum, the placenta has not abnormally invaded into the uterine tissue, the myometrium is usually clearly visible and $> \leq 2\text{mm}$ thick [13]. A careful analysis of the combination of these sonographic findings therefore reduced our suspicion for PAS and inclined our prenatal diagnosis in favour of uterine dehiscence (see Table 1). Nevertheless, the differential diagnosis between these two conditions is not always straightforward on antenatal imaging therefore, imaging professionals are encouraged to seek expert opinion to confirm diagnosis when they are in doubt. Also, uterine dehiscence and PAS can co-exist in the same patient, for this reason, careful examination of the entire placenta for all signs of PAS is recommended mandatory.

Similarly, uterine scar dehiscence with the placenta seen underneath could be incorrectly diagnosed as abnormally invasive placenta intraoperatively if the surgeon is inexperienced with this condition. An obvious placenta bulge through a dehiscent lower uterine segment that is completely covered by a very thin serosa membrane is seen intraoperatively which is surrounded by completely normal myometrium and there is no neovascularization [14]. In this situation, the placenta can be removed without massive haemorrhage as it is surrounded by normal myometrium and is not abnormally attached or invaded into the uterus.

Accurate prenatal differentiation between these closely related concepts is essential in planning the surgical procedure as well as timing of the delivery. In this case, due to the significant separation of the myometrial tissue observed on ultrasound and severe lower abdominal pain, the baby was delivered prematurely due to the risk of uterine rupture with prolonging the pregnancy. Also, accurate diagnosis enables adequate planning for the surgical procedure since a multidisciplinary approach and intra-operative management differs between these two conditions. An aggressive management approach which usually entails caesarean hysterectomy is used in PAS but not in cases of “uterine window”. In view of this, the prenatal counselling approach differs significantly between these two conditions.

LEARNING POINTS/TAKE HOME MESSAGES 3-5 *bullet points*

1. An accurate prenatal diagnosis of uterine scar dehiscence can be made and differentiated from PAS by assessing the presence of abnormally thinned myometrium with normal myometrial thickness clearly seen at the edges of the ‘bulge’ and without additional sonographic makers of PAS.
2. This criterion can be applied to any part of the uterus where there is full thickness scar tissue (e.g. after myomectomy) and PAS might be suspected.
3. Obstetricians, sonographers and radiologists should be educated regarding the differential sonographic features when screening for PAS to avoid confusing these two conditions and be encouraged to seek a second opinion when there is any doubt.

REFERENCES

- 1 Ramadan MK, Kassem S, Itani S, *et al.* Incidence and Risk Factors of Uterine Scar Dehiscence Identified at Elective Repeat Cesarean Delivery: A Case-Control Study. *J Clin Gynecol Obstet* 2018;**7**:37–42. doi:10.14740/jcgo.v7i2.481
- 2 O'Brien JM, Barton JR, Donaldson ES. The management of placenta percreta: conservative and operative strategies. *Am J Obstet Gynecol* 1996;**175**:1632–8. doi:10.1016/s0002-9378(96)70117-5
- 3 Kan A. Classical Cesarean Section. *Surg J* 2020;**6**:S98–103. doi:10.1055/s-0039-3402072
- 4 Soyer P, Barat M, Loffroy R, *et al.* The role of interventional radiology in the management of abnormally invasive placenta: a systematic review of current evidences. *Quant Imaging Med Surg* 2020;**10**:1370–91. doi:10.21037/qims-20-548
- 5 Fox NS, Gerber RS, Mourad M, *et al.* Pregnancy Outcomes in Patients With Prior Uterine Rupture or Dehiscence. *Obstet Gynecol* 2014;**123**:785–9. doi:10.1097/AOG.0000000000000181
- 6 Hatstat LM. Sonographic Assessment of Uterine Dehiscence During Pregnancy in Women With a History of Cesarean Section: A Case Series. *J Diagn Med Sonogr* 2016;**32**:283–6. doi:10.1177/8756479316661246
- 7 Jauniaux E, Collins S, Burton GJ. Placenta accreta spectrum: pathophysiology and evidence-based anatomy for prenatal ultrasound imaging. *Am J Obstet Gynecol* 2018;**218**:75–87. doi:10.1016/j.ajog.2017.05.067
- 8 Chantraine F, Braun T, Gonser M, *et al.* Prenatal diagnosis of abnormally invasive placenta reduces maternal peripartum hemorrhage and morbidity. *Acta Obstet Gynecol Scand* 2013;**92**:439–44. doi:10.1111/aogs.12081
- 9 Einerson BD, Comstock J, Silver RM, *et al.* Placenta Accreta Spectrum Disorder: Uterine Dehiscence, Not Placental Invasion. *Obstet Gynecol* 2020;**135**:1104–11. doi:10.1097/AOG.00000000000003793
- 10 Morlando M, Collins S. Placenta Accreta Spectrum Disorders: Challenges, Risks, and Management Strategies. *Int J Womens Health* 2020;**12**:1033–45. doi:10.2147/IJWH.S224191
- 11 Collins SL, Ashcroft A, Braun T, *et al.* Proposal for standardized ultrasound descriptors of abnormally invasive placenta (AIP). *Ultrasound Obstet Gynecol* 2016;**47**:271–5. doi:https://doi.org/10.1002/uog.14952
- 12 Matthews KC, Fields JC, Chasen ST. Suspected Placenta Accreta: Using Imaging to Stratify Risk of Morbidity. *Am J Perinatol* Published Online First: 8 June 2020. doi:10.1055/s-0040-1712948
- 13 Sasagasako N, Tani H, Chigusa Y, *et al.* Placenta Accreta in a Woman with Childhood Uterine Irradiation: A Case Report and Literature Review. *Case Rep Obstet Gynecol* 2019;**2019**:e2452975. doi:10.1155/2019/2452975

- 14 Collins SL, Alemdar B, van Beekhuizen HJ, *et al.* Evidence-based guidelines for the management of abnormally invasive placenta: recommendations from the International Society for Abnormally Invasive Placenta. *Am J Obstet Gynecol* 2019;**220**:511–26. doi:10.1016/j.ajog.2019.02.054
- 15 Finberg HJ, Williams JW. Placenta accreta: prospective sonographic diagnosis in patients with placenta previa and prior cesarean section. *J Ultrasound Med* 1992;**11**:333–43. doi:https://doi.org/10.7863/jum.1992.11.7.333

FIGURE/VIDEO CAPTIONS

Figure 1 shows a fairly homogenous placenta with the absence of abnormal lacunae, retroplacental vascularity over an area of undetectable myometrium spanning a length of 2.3cm

Figure 2 shows the intraoperative image of a dehiscence lower uterine segment with placenta bulging through it. Other areas show very thinned lower segment with the placenta and placenta vessels seen directly behind it. Notice that the surrounding uterine tissue is normal with no evidence of neovascularization.

Tables

EW-AIP signs of PAS [7]	Uterine dehiscence with overlying placenta
2D Greyscale	
Loss of clear zone	Usually present
Abnormal placenta lacunae (Finberg grade 3) [15]	Often some lacunae present but not Finberg grade 3
Bladder wall interruption	Not seen
Myometrial thinning <1mm or undetectable	Present
Placental bulge	Usually present
Focal exophytic mass	Not seen
2D Colour Doppler	
Uterovesical hypervascularity	Not seen
Subplacental hypervascularity	Not seen
Bridging vessels	Not seen
Placenta lacunae feeder vessels	Not seen
3D Power Doppler	
Intraplacental hypervascularity	Not seen

Table 1.0 shows a comparison between sonographic findings of uterine dehiscence with overlying placenta and placenta accreta spectrum.

INTELLECTUAL PROPERTY RIGHTS ASSIGNMENT OR LICENCE STATEMENT

I, **Sally Collins** the Author has the right to grant and does grant on behalf of all authors, an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the relevant stated licence terms for US Federal Government Employees acting in the course of the their employment, on a worldwide basis to the BMJ Publishing Group Ltd ("BMJ") and its licensees, to permit this Work (as defined in the below licence), if accepted, to be published in BMJ Case Reports and any other BMJ products and to exploit all rights, as set out in our licence [author licence](#).

Date: 11/05/2021