UTERINE ARTERIOVENOUS MALFORMATIONS AS A CONSEQUENCE OF THE RISING CAESAREAN SECTION RATE: A RARE CASE STUDY

Agastra O [1], Orefice R [1]

[1] Department of Obstetrics and Gynaecology, Centenary Hospital for Women and Children, Australian Capital Territory

Background

An arteriovenous malformation (AVM) of the uterus is relatively uncommon but life-threatening medical condition. It results from an abnormal relationship between arteries and veins, which can occur in any part of the body, and is thought to be congenital or acquired in nature. Acquired AVMs of the uterus can be as a result of surgical procedures such as Caesarean sections and uterine dilation and curettage, as well as a first trimester pregnancy loss and gestational trophoblastic disease (1, 2). As the Caesarean section rate increases so does the rate of subsequent uterine AVM formation (3).

Discussion

Acquired uterine AVMs usually occur in multiparous women who have undergone gynaecological procedures (4). The mean age of women diagnosed with an AVM is 30 years (6). The most common presentations are per vaginal bleeding, anaemia and vague pelvic discomfort (4, 5).

The rise in Caesarean births has resulted in an increase in placentation abnormalities in subsequent pregnancies, including morbidly adherent placenta and Caesarean scar pregnancies (6). A Caesarean scar pregnancy (CSP) is a rare type of ectopic pregnancy that arises from the abnormal implantation of a pregnancy in a previous Caesarean section scar. It is thought that the fundamentally erosive nature of the trophoblast during implantation into the defective endometrium of the Caesarean scar causes abnormal vascularisation, and a subsequent AVM can form (6). In our case study, it is likely that the large AVM was due to a previous CSP.

Morbidity from acquired AVMs can be significant. In one study, around 50% of patients with an acquired AVM required a blood transfusion secondary to anaemia (4). In addition to this, other complications such as hypotension secondary to significant blood loss and even cardiac decompensation secondary to shunting can result in significant maternal morbidity as well as potential mortality associated with this condition (5,7).

Transvaginal ultrasound is the key modality for evaluating a woman with a suspected AVM (4). Diagnosis is established by assessing the vasculature, which shows high velocity blood flow with low impedance on Doppler ultrasound (7). Magnetic Resonance Imaging (MRI) or angiography can be also be utilised to further characterise the AVM (7).

Management options for the treatment of uterine AVMs include conservative management, uterine artery embolization, resection of the AVM or hysterectomy (1). There is no consensus on the optimal treatment for uterine AVMs, which remains an area for exploration.

In summary, we presented a case of an acquired uterine AVM, most likely secondary to a CSP and discussed the implications of this rare but important gynaecological condition. It is important to remain vigilant about the possible formation of Caesarean scar AVMs in women who have had a Caesarean section as they can be associated with significant maternal morbidity and mortality.

References

1. Rygh, A.B., et al., *Arteriovenous malformation as a consequence of a scar pregnancy.* Acta obstetricia et gynecologica Scandinavica, 2009. **88**(7): p. 853-855.
2. Jurkovic, D., et al., *First-trimester diagnosis and management of pregnancies implanted into the lower uterine segment Cesarean section scar.* Ultrasound in Obstetrics and Gynecology: The Official Journal of the International Society of Ultrasound in Obstetrics and Gynecology, 2003. **21**(3): p. 220-227.
3. Pang, Y., et al., *Caesarean section scar pregnancy: a case series at a single tertiary centre.* Singapore Med J, 2012. **53**(10): p. 638-642.
4. Yoon, D.J., et al., *A systematic review of acquired uterine arteriovenous malformations: pathophysiology, diagnosis, and transcatheter treatment.* American Journal of Perinatology Reports, 2016. **6**(01): p. e6-e14.
5. Peitsidis, P., et al., *Uterine arteriovenous malformations induced after diagnostic curettage: a systematic review.* Archives of gynecology and obstetrics, 2011. **284**(5): p. 1137-1151.
6. Kim, D., et al., *Acquired uterine arteriovenous malformation in a cesarean scar pregnancy.* Taiwan J Obstet Gynecol, 2013. **52**(4): p. 590-592.
7. Timmerman, D., et al., *Color Doppler imaging is a valuable tool for the diagnosis and management of uterine vascular malformations.* Ultrasound in obstetrics & gynaecology, 2003. **21**(6): p. 570-577.

Case study

A 32-year-old woman, gravida 3 para 2, presented with unprovoked, moderate vaginal bleeding associated with abdominal pain at approximately 6 weeks following a spontaneous miscarriage. Her obstetric history revealed that she had two previous uncomplicated Caesarean sections for a breech presentation in the first pregnancy and an uncomplicated elective repeat Caesarean section at 39 weeks gestation in the second pregnancy. Her cervical screening was up to date, and she was well with no significant medical problems.

On examination, she was haemodynamically stable with a soft abdomen and mild suprapubic tenderness. On speculum examination, the cervix was long and closed with small amount of per vaginal bleeding seen. Her serum human chorionic gonadotropin was 6IU/L. Transvaginal ultrasound examination showed a 49 x 48mm mass of abnormal vasculature in the lower anterior uterine wall adjacent to the Caesarean section scar and bladder. Doppler studies demonstrated a peak systolic velocity of 76.13 cm/s with resistance index (RI) of 0.68, consistent with an AVM. This scan raised the possibility that there was a previous CSP given the patient's history.

Bilateral uterine artery embolization was performed with Gelfoam, followed by an ultrasound guided dilatation and curettage of the uterus. Estimated blood loss was 200mL. Histopathology confirmed products of conception. On review at 6 weeks post operatively, she was well and her menses had resumed.

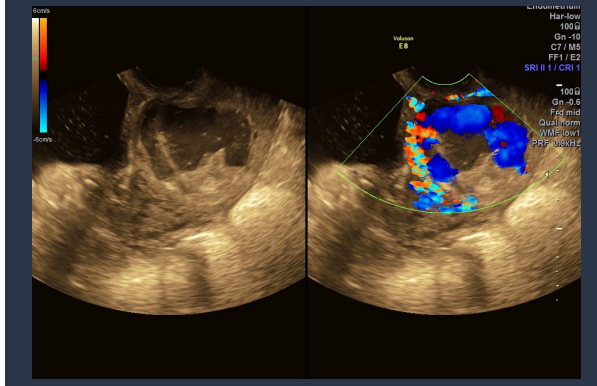

Image 1: transvaginal colour Doppler ultrasound of abnormal vasculature.

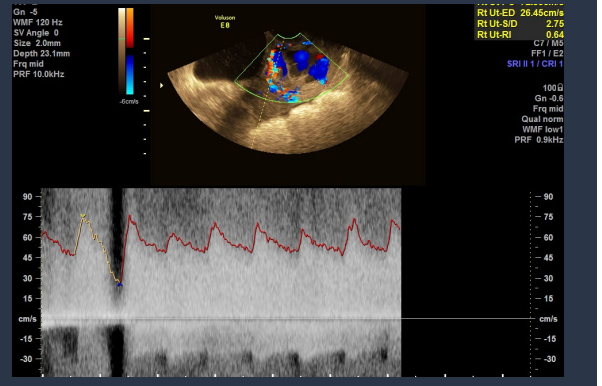

Image 2: transvaginal colour and pulsed Doppler ultrasound of the abnormal vasculature .