Texila International Journal of Public Health
Special Issue-2024
DOI: 10.21522/TIJPH.2013.SE.24.05.Art009

A Case of Retained Products of Conception Adherent to the Caesarean Scar Site with AV Malformation Managed with Uterine Artery Embolisation

Deepthi P[1*], Anne Johncy K[1], Jayashree Srinivasan[1], Pavithra, R[2], Hemapriya N[2], Maghimaa Mathanmohun[2]

[1]Department of Obstetrics and Gynaecology, Saveetha Medical College and Hospitals, Saveetha Institute Medical and Technical Sciences, Saveetha University, Chennai-602105, Tamil Nadu, India
[2]Centre for Global Health Research, Saveetha Medical College and Hospital, Saveetha Institute of Medical and Technical Sciences, Chennai-602 105, Tamil Nadu, India

Abstract

Retained products of conception (RPOC) and uterine arteriovenous malformations (AVM) are uncommon but serious causes of abnormal uterine bleeding (AUB). This case involves a 29-year-old woman, Para 2 Live 2, with a history of two caesarean sections and two previous abortions, who experienced heavy menstrual bleeding following medical termination of pregnancy (MTP) and tubectomy. Initially managed conservatively with methotrexate, she presented again a month later with recurrent AUB. Ultrasound and Doppler imaging revealed a thickened endometrium with significant vascularity, indicating RPOC and uterine AVM. Her β-HCG levels were elevated (47.13) but trended downward upon repeat testing. Based on interventional radiology advice, she underwent bilateral uterine artery embolization (UAE) with gel foam. Following the procedure, the patient's symptoms improved significantly, with a noticeable reduction in both the frequency and intensity of her bleeding episodes. Her β-HCG levels continued to decline, and no further episodes of heavy bleeding were noted during the one-month follow-up. This case highlights the diagnostic challenges associated with RPOC and uterine AVM, particularly after abortion. Doppler ultrasound plays a key role in detecting vascular abnormalities. Uterine artery embolization is an effective and safe first-line treatment, reducing hemorrhage risk and the need for hysterectomy. Early identification and intervention are critical to prevent life-threatening complications and ensure a favorable outcome.

Keywords: *Abnormal Uterine Bleeding, Arteriovenous Malformations, Retained Products of Conception, Uterine Artery Embolization.*

Introduction

Retained products of conception (RPOC) refers to persistent trophoblastic tissue that remains inside the uterine cavity after medical or surgical termination of pregnancy, miscarriage, vaginal or caesarean delivery. Arteriovenous malformations (AVM) are abnormal communication between the artery and venous system bypassing the intervening capillary bed. Uterine AVM is a rare yet potentially fatal cause of abnormal uterine bleeding (AUB) in young females [1]. Therefore, Prompt diagnosis is required to delineate the cause and decide on management options.

Case Report

A 29 year old Para 2 Live 2, sterilised, with h/o Previous 2 Lower segment caesarean section and previous 2 abortions came with c/o heavy menstrual bleeding on and off x 1 month.

Received: 21.09.2024 ***Accepted: 11.11.2024*** ***Published on: 10.12.2024***
Corresponding Author: deepthiparthiban@gmail.com

The Patient had h/o spotting PV for 2 weeks, followed by heavy menstrual bleeding for 15 days, moderate flow. She is a known case of T2DM on oral metformin 500 mg BD.

The patient had underg MTP with suction and evacuation and Transabdominal Tubectomy 1 month before, following which she developed this abnormal uterine bleeding. USG abdomen and pelvis showed heterogenously thickened endometrium with significant vascularity and suggested MRI pelvis to rule out AV malformation. MRI pelvis showed Caesarean scar site implantation of retained products with marked vascularity. The decision was taken for conservative management and inj methotrexate 80 mg IM was given, patient improved and was discharged (Figure 1, 2).

The patient got readmitted one month later with similar complaints. On examination, the Vitals were stable. Mild pallor present. Per abdomen was unremarkable. Per vaginal examination revealed an anteverted uterus of 10 weeks in size. USG abdomen and pelvis was done which showed heterogenously thickened endometrium and on doppler studies (Figure 3), the colour flow was noted within myometrium and endometrium showing mixed arterio venous waveform indicating arterio venous malformation. Beta HCG was done which was 47.13. Repeat Beta HCG was done 48 hours later and was found to be 44.97. Interventional radiology opinion was sought, and the patient underwent bilateral uterine artery embolisation with gel foam in view of retained products of conception with arteriovenous malformations on 18/7/24. The post-procedure period was uneventful, and patient had a good recovery. Repeat Beta HCG done 48 hours later was found to be 28.18. Frequency and intensity of her bleeding episodes got reduced, and no recurrence of heavy bleeding episodes were reported for one month follow up.

Figure 1. Selective Right Uterine Artery Angiogram

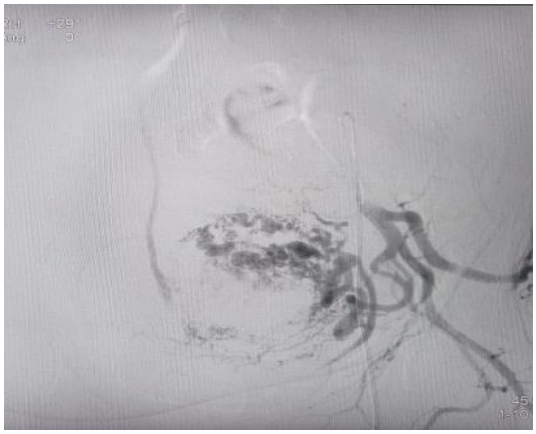

Figure 2. Selective Left Uterine Artery Angiogram

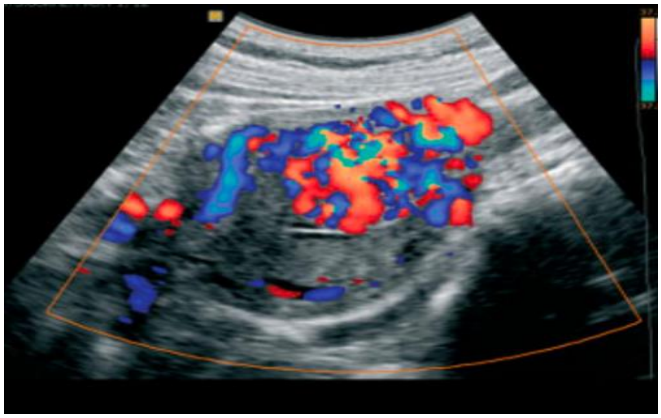

Figure 3. Doppler Ultrasonography showing Hypervascular Lesion

Discussion

Abnormal uterine bleeding after miscarriage may be due to retained product of conceptions, non-obliteration and subinvolution of the blood vessels of the placental bed, and secondary to UAVM formation [2]. These all share similar radiologic findings which can prove to be a diagnostic challenge. RPOC has vascular endometrial components whereas Arterio-venous Malformations (AVM) primarily involve the myometrium [3, 4]. The other differentials can be invasive moles, sub-involution of the placental implantation site [5]. Clinical presentation and β-HCG levels may guide in differentiating these conditions. The diagnosis requires an ultrasound (US) examination with Doppler study which will provide information about the degree of vascularization [6].

With routine use of imaging modalities like doppler ultrasound, more cases are being reported, however, there is a risk of over-diagnosis as all hypervascular lesions with turbulent flow may not be AVM [7]. Recently, a specific form of RPOC, described as "marked vascularity" or "highly vascularized," has been identified, with an estimated incidence of 18% based on Doppler imaging results [8–10], and frequently associated with arteriovenous (AV) shunts [11]. In this condition, the highly vascular nature of the lesion is prone to fatal hemorrhagic complications related to surgical removal. Hence, uterine artery embolization (UAE) could be a suitable option, which has only been sparsely reported in the treatment of RPOC [8]. RPOC mostly occurs in a postabortal setting, but there has also been a history of uterine trauma in a majority of patients, which could be a factor favouring the development of hypervascular lesions [2, 8].

Goyal et al. also reported a patient with uterine AVM in trophoblastic tissues, discovered late 6 months after abortion and D&C (24). Paul Bazeries et al identified uterine arteriovenous shunts developed in RPOC and had been diagnosed and treated more than 3 months after the termination of pregnancy [12].

Such recurrent complex vascular lesions reinforce the hypothesis of a relationship between RPOC and arteriovenous shunt development, related to persistent hypertrophied vascular connections with the underlying uterus wall [13]. When delayed, this can lead to authentic uterine AVM, exposing patients to spontaneous massive hemorrhage, delayed after a slow progression [12]. Kamaya et al. suggested an interesting Doppler US classification based on the intensity of the color signal, from type 0 to 3 RPOC, where type 3 is described as exuberant vascularity mimicking uterine AVM [10]. For these reasons, evaluation of the blood supply to RPOC appears of utmost importance in the choice of treatment, and UAE stands out as a suitable first-line option in specific cases of RPOC with MV on the Doppler US [12], while operative hysteroscopy remains the standard procedure for the removal of RPOC [14].

Diagnosis is very crucial as management is different and commonly utilized hemostatic curettage is a contraindication in the case of AVM [1]. Congenital uterine AVMs are rare and are usually seen involving multiple organs, having multiple vascular connections, and may be seen invading other structures [15]. Acquired AVMs are more common and usually associated with pregnancy-related events like post-instrumentation, uterine surgeries, uterine infections like endometritis, and genital tract malignancy [16,17]. The ultrasonographic diagnosis of AVM is based on the presence of hypoechoic tortuous spaces in the myometrium demonstrating vascular flow as evidenced by color Doppler [18]. Spectral analysis of the vessels shows low impedance and high-velocity flow. Timmerman et al. described that these ultrasonographic findings of AVM can correspond to both real uterine AVM ‘‘high-flow arteriovenous malformations’ and to uterine non-AVM ‘‘low-flow arteriovenous malformations’’. In contrast to a real arteriovenous malformation with an angiographic presentation of a fistula, a non-arteriovenous malformation should be considered as subinvolution of the placental bed, which is defined as failure of obliteration of the placental bed vessels in the absence of retained placental tissue after cessation of pregnancy or after abortion [3]. Traditionally, hysterectomy was the treatment of choice, before embolization procedures were widely introduced and accepted [18]. Various embolic materials have been used, including PVA particles, stainless steel coils, gelfoam, Ethanol and histoacryl, trisacryl particles, detachable balloons, and thrombin [15, 19].

A newer and upcoming therapeutic option is the hysteroscopic excision of the AVM nidus [1]. There are concerns regarding uterine artery embolisation (UAE) altering the blood supply to the uterus and affecting fertility but reports showing successful pregnancies and deliveries post UAE [20].

In a systematic review conducted by Panagiotis Peitsidis et al, menstruation went back to normal within 1–2 months post-procedure and none of the subjects experienced amenorrhea [15]; however, there was a 4% incidence of amenorrhea in patients who underwent bilateral UAE for treatment of uterine myomas in a study conducted by Joffre F et al [21]. It was estimated the mean period of subsequent pregnancy after UAE of 15.7 ± 11.7 months with a range of 2 to 36 months [22, 23]. The period was consistent with the period of 15.6 months reported in the observational study Long-term consequences of UAE have also been widely studied and women who undergo embolization therapycan expect a return to normal menses with no adverse effect on fertility in 91–100% of cases [24-27].

Conclusion

Retained products of conception with marked vascularity may present as complex vascular lesions, sometimes progressing into large uterine arteriovenous shunts, particularly when presenting late. USG Doppler studies prove to be effective first-line screening in diagnosing these complex lesions. Uterine artery embolization (UAE) is safe and effective first-line management, minimizing the risk of hemorrhage compared to conventional surgical removal and reducing hysterectomy risk.

Acknowledgement

We would like to acknowledge the Department of Obstetrics and Gynaecology, Saveetha Medical College and Hospitals, and Saveetha Institute of Medical and Technical Sciences for providing the necessary facilities. The authors extend their acknowledgement to the JSS AHER management, in Mysuru, Karnataka, for providing the required resources and support.

Conflict of Interest

The authors hereby declare that there is no conflict of interest in this study.

References

[1]. Mishra, V., Chhetry. M., Pathak, K., Choudhary, S., 2024. Uterine Artery Embolization for Acquired Arteriovenous Malformation in Young Patients with Abnormal Uterine Bleeding: From Diagnosis to Management Asking the Right Questions! Insights from a Case Report. *Journal of South Asian Federation of Obstetrics and Gynaecology*, 16, 322–324. Doi:10.5005/jp-journals-10006-2416.

[2]. Yoon, D. J., Jones, M., Taani, J. A., Buhimschi, C., Dowell, J. D., 2016. A Systematic Review of Acquired Uterine Arteriovenous Malformations: Pathophysiology, Diagnosis, and Transcatheter Treatment. *AJP Reports*, 6, e6. Doi:10.1055/s-0035-1563721.

[3]. Timmerman, D., Wauters, J., Van Calenbergh, S., Van Schoubroeck, D., Maleux, G., Van Den Bosch, T., et al., 2003. Color Doppler imaging is a valuable tool for the diagnosis and management of uterine vascular malformations. *Ultrasound in Obstetrics & Gynecology*, 21, 570–577. Doi:10.1002/uog.159.

[4]. Sambashivaiah, J., Velayudam, L., Tigga, M., Manoli, N., 2020. Uterine arteriovenous malformation as a cause of secondary postpartum hemorrhage: A case report. *Journal of South Asian Federation of Obstetrics and Gynaecology*, 12(3), 189.

[5]. Sellmyer, M., Desser, T., Maturen, K., Jeffrey, R., Kamaya, A., 2013. Physiologic, histologic, and imaging features of retained products of conception. Radiographics : A review publication of the *Radiological Society of North America Inc*, 33, 781–796. Doi:10.1148/rg.333125177.

[6]. Van Den Bosch, T., Van Schoubroeck, D., Lu, C., De Brabanter, J., Van Huffel, S., Timmerman D., 2020. Color Doppler and gray-scale ultrasound evaluation of the postpartum uterus. Ultrasound in Obstetrics Gynecology, 20, 586–591. Doi:10.1046/j.1469-0705.2002.00851.x.

[7]. Annaiah, T., Sreenivasan, S., 2015. Uterine arteriovenous malformations: clinical implications. *The Obstetrician & Gynaecologist*, 17, 243–250. Doi:10.1111/tog.12218.

[8]. Kitahara, T., Sato, Y., Kakui, K., Tatsumi, K., Fujiwara, H., Konishi, I. 2011. Management of retained products of conception with marked vascularity. *Journal of Obstetrics and Gynaecology Research*, 37(5), 458-464.

[9]. Van den Bosch, T., Van Schoubroeck, D., Timmerman, D., 2015. Maximum Peak Systolic Velocity and Management of Highly Vascularized Retained Products of Conception. *Journal of Ultrasound in Medicine Official Journal of the American Institute of Ultrasound in Medicine*, 34. 1577–1582. Doi:10.7863/ultra.15.14.10050.

[10]. Kamaya, A., Petrovitch, I., Chen, B., Frederick, C. E., Jeffrey, R. B., 2009. Retained products of conception: spectrum of color Doppler findings. *J Ultrasound Med*. 28: 1031–1041. Doi:10.7863/jum.2009.28.8.1031.

[11]. Jain, K., Fogata, M., 2007. Retained products of conception mimicking a large endometrial AVM: Complete resolution following spontaneous abortion. *Journal of Clinical Ultrasound Jcu*, 35. Doi:10.1002/jcu.20250.

[12]. Bazeries, P., Paisant-Thouveny, F., Yahya, S., Bouvier, A., Nedelcu, C., Boussion, F., Aubé, C. 2017. Uterine artery embolization for retained products of conception with marked vascularity: a safe and efficient first-line treatment. *Cardiovascular and Interventional Radiology*, 40. Doi:10.1007/s00270-016-1543-7.

[13]. Kido, A., Togashi, K., Koyama, T., Ito H, Tatsumi K, Fujii S, et al., 2003. Retained products of conception masquerading as acquired arteriovenous malformation. *J Comput Assist Tomogr*, 27, 88–92. Doi:10.1097/00004728-200301000-00016.

[14]. Cohen, S. B., Kalter-Ferber, A., Weisz, B. S., Zalel, Y., Seidman, D. S., Mashiach, S., Goldenberg, M., 2001. Hysteroscopy may be

the method of choice for management of residual trophoblastic tissue. *The Journal of the American Association of Gynecologic Laparoscopists*, 8, Doi:10.1016/s1074-3804(05)60577-4.

[15]. Grivell, R. M., Reid, K. M., Mellor, A., 2005. Uterine arteriovenous malformations: a review of the current literature. *Obstet Gynecol Surv*, 60, 761–767. Doi: 10.1097/01.ogx.0000183684.67656.ba.

[16]. Hickey, M., Fraser, I. S., 2000. Clinical implications of disturbances of uterine vascular morphology and function. *Baillieres Best Pract Res Clin Obstet Gynaecol*, 14, 937–951. Doi:10.1053/beog.2000.0136.

[17]. Sugiyama, T., Honda, S., Kataoka, A., Komai, K., Izumi, S., Yakushiji. M., 1996. Diagnosis of uterine arteriovenous malformation by color and pulsed Doppler ultrasonography. *Ultrasound in Obstetrics & Gynecology*, 8. 359–360. Doi:10.1046/j.1469-0705.1996.08050355-3.x.

[18]. Hoffman, M. K., Meilstrup, J. W., Shackelford. D. P., Kaminski, P. F., 1997. Arteriovenous malformations of the uterus: An uncommon cause of vaginal bleeding. *Obstetrical & Gynecological Survey*, 52: 736.

[19]. Qian, Z. D., Weng, Y., Du, Y. J., Wang, C. F., & Huang, L. L., 2017. Management of persistent caesarean scar pregnancy after curettage treatment failure. *BMC Pregnancy and Childbirth*, 17: 208. Doi:10.1186/s12884-017-1395-4.

[20]. Vilos, A. G., Vilos, G. A., Hollett-Caines, J., Rajakumar, C., Garvin, G., Kozak, R., 2015. Uterine artery embolization for uterine arteriovenous malformation in five women desiring fertility: pregnancy outcomes. *Human Reproduction*, 30, 1599–1605. Doi:10.1093/humrep/dev097.

[21]. Joffre, F., Tubiana, J, M., Pelage, J.P., 2004. FEMIC: Uterine fibroid embolization using tris-acryl microspheres. A french multicenter study. cardiovascular and interventional radiology, 27, 600–6. Doi:10.1007/s00270-004-0078-5.

[22]. Peitsidis, P., Manolakos, E., Tsekoura, V., Kreienberg, R., Schwentner, L., 2011. Uterine arteriovenous malformations induced after diagnostic curettage: a systematic review. Archives of Gynecology and Obstetrics, 284, 1137-1151.

[23]. Maleux, G., Timmerman, D., Heye, S., Wilms, G., 2006, Acquired uterine vascular malformations: Radiological and clinical outcome after transcatheter embolotherapy. *European Radiology*, 16, 299–306. Doi:10.1007/s00330-005-2799-5.

[24]. Salomon, L. J., de Tayrac, R., Castaigne-Meary, V., Audibert, F., Musset, D., Ciorascu, R., et al., 2003. Fertility and pregnancy outcome following pelvic arterial embolization for severe post-partum haemorrhage. A cohort study. *Human Reproduction*, 18, 849–852. Doi:10.1093/humrep/deg168.

[25]. Nijamudeen, S. S., 2020. A Study of Awareness on Artificial Insemination among Medical College Students. *Indian Journal of Forensic Medicine & Toxicology*, 14(3).

[26]. Ramesh, A., Chander, R. V., Srinivasan, C., Vengadassalapathy, S. 2020. Prevalence of angiogenesis, proliferation, and apoptosis markers of cervical cancer and their correlation with clinicopathological parameters. *Journal of Oncology*, 2020(1), 8541415.

[27]. Omani-Samani, R., Hollins Martin, C. J., Martin, C. R., Maroufizadeh, S., Ghaheri, A., Navid, B., 2021. The birth satisfaction scale-revised Indicator (BSS-RI): A validation study in Iranian mothers. *The Journal of Maternal-Fetal & Neonatal Medicine*, 34(11), 1827-1831.