Journal of Cardiovascular Disease Research
ISSN: 0975-3583,0976-2833 VOL 15, ISSUE 10,2024

Original Research

Resection of Uterine AVM - Cost effective management in low resource set up

Dr. Sujata Rawat [1], Dr. Asha Garg [2], Dr. Khushdeep Singla [3], Dr. Shirin [4]

[1]Assistant Professor, Department of Obstetrics and Gynaecology Adesh Institute of medical sciences & research Bathinda
[2]Assistant Professor, Department of Obstetrics and Gynaecology Adesh Institute of medical sciences & research Bathinda
[3]Assistant Professor, Department of Radiodiagnosis Adesh Institute of medical sciences & research Bathinda
[4]3rd year Postgraduate , Department of Obstetrics and Gynaecology Adesh Institute of medical sciences & research Bathinda

Corresponding Author:
Dr. Asha Garg
Assistant Professor, Department of Obstetrics and Gynaecology Adesh Institute of medical sciences & research Bathinda

Received: 19 August 2024 Accepted: 27 September 2024

ABSTRACT
Uterine arteriovenous malformation (AVM) is a vascular hamartoma of the myometrium characterized by the presence of shunts between the myometrial arteries and veins. Most of the uterine AVMs are acquired after damage to uterine tissue. AVM uterus presents most commonly with heavy bleeding per vaginum, and if left untreated can result in torrential life threatening bleeding.
There are various treatment modalities for uterine AVM , namely, hysteroscopic resection , uterine artery embolisation. Both modalities have their own pros and cons.
Here, we are presenting a case series of A novel technique of removal of AVM by Suction evacuation followed by check hysteroscopy, intrauterine foleys catheter tamponade.
This may be helpful in centers where resectoscope and instruments of operative hysteroscopy is not available.
We report 14 cases of acquired AVM (after D/C) , which were successfully treated surgically with Hysteroscopy, suction evacuation ,foleys tamponade. We advocate this treatemnt stratergy for resection of AVM in low resource settings where facilities for operative hysteroscopy is not available, associated with good cure rates and minimal complications.

Introduction
Uterine arteriovenous malformation (AVM) is a vascular hamartoma of the myometrium characterized by the presence of shunts between the myometrial arteries and veins.
It is abnormal and nonfunctional connections between uterine arteries and veins.Most of the uterine AVMs are acquired after damage to uterine tissue.
It can develop following previous uterine trauma miscarriage or MTP, cesarean section, vaginal delivery, carcinoma of the cervix or endometrium, dilation and curettage (D&C). It has also been associated with uterine infection, trophoblastic disease, endometriosis, or exposure to diethylstilbestrol. 1–3
AVM uterus presents with symptoms of Bleeding pv, continuous or intermittent. Treatment modalities for uterine AVM are largely surgical intervention, or Interventional Radiology pertaining to their size, symptoms at presentation. Both Modalities have their own merits and demerits, and treatment is individualized.

Materials and Methods –
This is a retrospective analysis study of all the cases of uterine AVM treated at our institution (Adesh Institure of Medical sciences and research, Bathinda) between March 2022 and July 2024.
The patients were referred to our tertiary hysteroscopy center from minor city hospitals and outpatient clinics with ultrasound diagnosis of AVM.
Study design - Retrospective Case series analysis
Participants- All patients with AVM diagnosed by pelvic doppler ultrasonography

Inclusion Criteria:
1. Reproductive age group

2. Doppler ultrasound showing AVM with high mean PSV (peak systolic velocity)
3. Patient consenting for the surgery

Exclusion Criteria:

1. Uterine AVM with low ultrasound doppler mean PSV < 52cm/sec.

Methodology

Diagnosis of AVM was made by TVS doppler ultrasound pelvis.

Our technique is Hysteroscopy guided AVM removal, which involves Hysteroscopy guided visualization of location of AVM followed by D& C, followed by Check hysteroscopy to confirm the removal of AVM.

This procedure ensures complete removal of AVM , by check hysteroscopy done after D & C , and if suggestive of incomplete removal, again D & C is done to ensure complete removal.

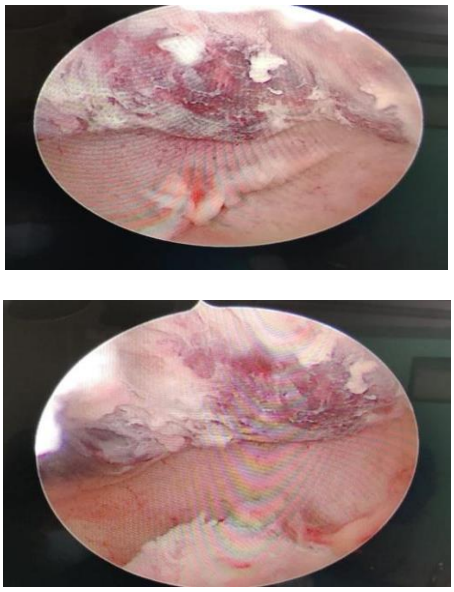
Then intrauterine foleys catheter was placed and inflated with 10-15ml saline to provide tamponade for 18 to 24 hours . slowly deflating the foleys tamponade over 4 to 6 hours prior to removal. Discharging the patient after 24 to 36 hours of surgery. Repeat pelvic ultrasonography was done 2 to 3 weeks after the resection of AVM to check for any residual lesion.

RESULT

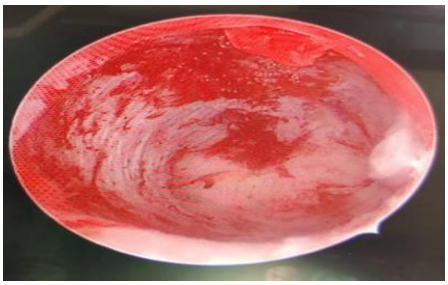
We identified 14 patients with AVM: in all cases, the AVM was consequent to uterine curettage for abortion. Median patient age was 27 (18 – 36) years and BMI was 24.7 (20.8 –28.6) kg/m2 (Table 1). The average size of the AVM was 20 mm, and the presenting symptom of all the patients was mild to moderate menorrhagia or intermenstrual bleeding. The position of the AVM in the uterus was anterior, posterior, right side, or left side. most common site being on anterior wall in our cases. Picture 1 depicting hysteroscopic view prior to procedure and picture 2 depicting post procedure view.

All patients were successfully treated with hysteroscopy; median duration of hysteroscopy surgery was 40 min (20–60), with no reported complications. No patient had residual disease at ultrasonography performed after 2 weeks.

All patients were successfully treated with hysteroscopy followed by suction evacuation & currettage followed by foleys intrauterine tamponade. all patients were discahrged after 24 -36 hours after procedure. none patient had residual lesion at ultrasonography done after 2 to 3 weeks of surgery.



Picture: 1 Hysteroscopic view of anterior wall AVM



Picture: 2 - Hysteroscopic view post suction evacuation of AVM

Patient	age	BMI	gravidity	parity	Previous abortion
1	30	19.5	2	1	1
2	26	20.4	3	2	1
3	27	20	3	2	1
4	28	21	2	0	2
5	34	21.3	3	2	1
6	32	24	4	3	1
7	27	21.1	2	1	1
8	30	20.3	2	1	1
9	27	22.3	1	0	0
10	26	20.5	2	1	1
11	28	21.2	3	1	2
12	28	22.1	2	1	1
13	30	22.4	2	0	2
14	29	21.3	2	1	1

Table: 1

Patient	Size of the lesion (cm)	Position of lesion inuterus	Duration of surgery (minutes)
1	2	anterior	40
2	1.8	anterior	25
3	1.7	posterior	20
4	2	posterior	30
5	1.5	anterior	20
6	1.5	fundal	20
7	2.4	anterior	25
8	1.5	posterior	30
9	1.8	ant erior	15
10	2.1	anterior	40
11	2.4	anterior	40

12	2	posterior	25
13	1.8	anterior	20
14	2.6	posterior	40

FOLLOW UP OF PATIENTS –

None of the patients had any residual AVM, performed by ultrasonography done 2 to 3 weeks after the surgical resection.

2 patients had off & on bleeding week after procedure, ultrasound showed no residual AVM lesion.it was resolved on doxycycline & norethisterone.

Rest all patients had uneventful course.

Disscussion

AVM uterus presents with symptoms of Bleeding pv, continuous or intermittent. In patients desirous of future fertility, it may present with concerns regarding future conception. Therefore it requires intervention in symptomatic patients, with significant size of AVM. Asymptomatic small size AVM (< 1 cm) have been managed conservatively with hormonal therapy [4].However, Mostly AVM requires surgical intervention, or Interventional Radiology pertaining to their size, symptoms at presentation.

Uterine artery embolization is minimally invasive modality of treating AVM , but its higher cost makes it less acceptable and less affordable by most of the patient.The efficacy of UAE in AVM is 57%[5,6]

Also, few studies have raised concerns regarding future fertility in UAE .

Disadvantages of UAE are high cost, concern regarding future fertility

Major risks for the patient after embolization of the uterine artery are postembolization syndrome (massive necrosis and infarction of the uterus, uterine artery rupture, and pelvic pain), transient or permanent amenorrhea, and radiation exposure.[5]

Doppler Ultrasound pelvis provides importnat tool in diagnosis of uterine AVM preoperatively, Timmerman D et al conducted a prospective observational study on 30 patients with uterine AVM by ultrasonography and color Doppler imaging. They included Spectral analysis measurement of flow velocities, pulsatility index (PI) and resistance index (RI). Close follow-up was arranged in all cases and the outcomes were recorded. They concluded, Doppler PSV values appear to be useful in distinguishing between low- and high-risk patients of uterine AVM.[7]

Other study by Lee TY et al also implicated role of doppler ultrasound in diagnosis of AVM uterus and its role in selecting treatment modality for uterine AVMs. [8]

The global success rate after uterine artery embolization treatment was 88.4%, presenting a low risk of adverse outcomes (1.8%), even in women with later pregnancy (77% had no complications) [9]. There is a paucity of high-level evidence with respect to Uterine AVM management. Embolisation has high treatment cost which makes it less favourable in developing countries, low resource settings.

This makes hysteroscopic removal of AVM more acceptable modality in treatment of AVM[10,11,12].Hysteroscopic removal of AVM is done by resectoscope, Loop, requires unipolar or bipolar cautery.

The disadvantages of this procedure being, requires instruments & setup, makes it not feasible in centers where the setup of operative hysteroscopy is not available.

The efficacy of Hysteroscopic removal of AVM is very high success rate , very few surgical related complications & short hospital stay.

But centers not equipped with facilities of operative hysteroscopy, our method of AVM removal (Diagnostic Hysteroscopy + D & C followed by Check Hysteroscopy in same setting) gives similar surgical cure.

Advantages of this procedure is, it can be done in low resource setting, where setup of operative hysteroscopy (resectoscope) is not available.

Also Our Technique of AVM removal alleviates the risks associated with operative hysteroscopy, that arise with use of Glycine & monopolar cautery, namely glycine toxicity, arrythmia, TURP like syndrome, electrosurgical burns.Another advantage of this procedure is ,that it can be performed by surgeons not skilled in resectoscopic procedures.

In Older times AVM uterus was managed with D & C alone, but this is associated with increased bleeding (which required management with uterine balloon tamponade or hysterectomy) . also blindly removing the AVM with D & C is associated with risk of leaving residual AVM , which may result in persistence or recurrence of Symptoms in patient.

However, Our this technique involves diagnostic hysteroscopy first to visualize & localise the site of AVM followed by D & C. Check Hysteroscopy to be done after D & C to ascertain complete removal of AVM in same setting.

CONFLICT OF INTEREST - None

CONCLUSION –

Hysteroscopic guided removal of AVM by suction evacuationfollowed by intrauterine foleys tamponade seems to be a promising option owing to its low cost, easy availability, safety, ease of procedure not requiring resectoscope, satisfactory outcome.

In this study , we propose a novel hysteroscopic minimally invasive treatment of AVM's in low resource settings where there is nonavailability of resectoscope, our stratergy minimises complications and provides successful surgical correction of uterine AVM.

Data on our series of patients are presented in this retrospective case series study, with a focal on low cost technique with fertility preserving option in our study population

Bibliography

1. Diwan RV, Brennan JN, Selim MA, et al. Sonographic diagnosis of arteriovenous malformation of the uterus and pelvis. J Clin Ultrasound. 1983;11:295–298.

2. Fleming H, Ostor A, Pickel H, Fortune D. Arteriovenous malformations of the uterus. Obstet Gynaecol. 1989;73:209 –213.

3. Huang MW, Muradali D, Thurston WA, Burns PN, Wilson SR. Uterine arteriovenous malformations: gray-scale and Doppler US features with MR imaging correlation. Radiology. 1998;206:115– 123.

4. Rosen A, Chan WV, Matelski J, Walsh C, Murji A. Medical treatment of uterine arteriovenous malformation: a systematic review and meta-analysis. Fertil Steril. 2021 Oct;116(4):1107-1116. doi: 10.1016/j.fertnstert.2021.05.095. Epub 2021 Jun 12. PMID: 34130801.

5.Yang JJ, Xiang Y, Wan XR. Diagnosis and management of uterine arteriovenous fistulas with massive vaginal bleeding. *Int J Gynaecol Obstet*. 2005;89:114–119.

6. Sanguin S, Lanta-Delmas S, Le Branche A. Uterine arteriovenous malformations: diagnosis and treatment in 2011. *Gynecol Obstet Fertil*. 2011;39:722–727.

7 Timmerman D, Wauters J, Van Calenbergh S, et al. Color Doppler imaging is a valuable tool for the diagnosis and management of uterine vascular malformations. *Ultrasound Obstet Gynecol*. 2003;21:570–577.

8 Lee TY, Kim SH, Lee HJ, et al. Ultrasonographic indications for conservative treatment in pregnancy-related uterine arteriovenous malformations. *Acta Radiol*. 2014;55:1145–1152.

9.Ruiz Labarta FJ, Pintado Recarte MP, González Leyte M, Arribas CB, Álvarez Luque A, Cuñarro López Y, García-Montero C, Fraile-Martinez O, Ortega MA, De León-Luis JA. Uterine Artery Embolization of Uterine Arteriovenous Malformation: A Systematic Review of Success Rate, Complications, and Posterior Pregnancy Outcomes. J Pers Med. 2022 Jul 1;12(7):1098. doi: 10.3390/jpm12071098. PMID: 35887595; PMCID: PMC9324499.

10. Calzolari S, Cozzolino M, Castellacci E, Dubini V, Farruggia A, Sisti G. Hysteroscopic Management of Uterine Arteriovenous Malformation. JSLS. 2017 Apr-Jun;21(2):e2016.00109. doi: 10.4293/JSLS.2016.00109. PMID: 28439193; PMCID: PMC5385144.

11. Kim, Tae Hee1; Kim, Nam Kyeong1; Kim, Seul Ki1,2,*; Lee, Jung Ryeol1,2; Jee, Byung Chul1,2; Kim, Yong Beom1,2; Kim, Seok Hyun2,3. Uterine Arteriovenous Malformation Treated by Hysteroscopic Excision. Gynecology and Minimally Invasive Therapy 8(3):p 132-134, Jul–Sep 2019. | DOI: 10.4103/GMIT.GMIT_114_18

12. Zhang, W., Cui, S., Mao, Z. *et al.* Effect of direct surgical treatment in pregnancy-related uterine arteriovenous malformation. *BMC Pregnancy Childbirth* **23**, 673 (2023). https://doi.org/10.1186/s12884-023-05961-3