

Uterine Artery Embolization for Single Fibroid

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ABSTRACT

Objective: Efficacy of uterine Artery Embolization for Single Fibroid

Study Design: Descriptive cross sectional study

Place and Duration of Study: This study was conducted at the Mayo Hospital, Lahore and Services Hospital, Lahore from May, 2019 to November, 2020.

Materials and Methods: A total of 37 patients with single fibroid of less than 10cm in size underwent UAE by Sildenger's Technique. Both uterine fibroids were thrombosed with embosphere 500 micron and were followed for six months.

Results: In 4 patients procedure could not be completed. In one of these patients procedure was abandoned due to extreme anxiety and non-cooperation while 3 had arterial spasm resulting in cancellation of procedure. In 25 patients there was complete necrosis of fibroid and 3 out of these 25 patients conceived during follow up period. In 6 patients procedure resulted in partial necrosis of fibroid and in 2 patients there was complete failure of procedure. These 8 patients had to undergo myomectomy.

Conclusion: UAE is minimal invasive uterus sparing procedure for management of uterine fibroid with short hospital stay.

Key Words: Uterine fibroid, menorrhagia, pelvic pain, UAE (Uterine artery embolization)

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INTRODUCTION

Uterine fibroids are the most common benign tumor of female reproductive system which arises from smooth muscle of uterus. 20 to 25 % of all women have uterine fibroid. 40% of menstruating female older than 50 years also have fibroids.¹ Black women have high incidence of uterine fibroids compared to Asian and white women.² Uterine fibroids can occur at any age between menarche and menopause. However incidence is most common between 35 to 49 years of age.

Uterine fibroids are classified by their location as submucosal, intramural and subserosal fibroids. Submucosal fibroids are least common. These are usually associated with heavy and prolonged menstrual flow as well as increased rate of miscarriage.

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Intramural fibroids usually present with pressure and mass related symptoms for example abdominal pain, distention and increased frequency of micturition due to compression of urinary bladder. Subserosal fibroids may present with pressure symptoms and the may be pedunculated.³

Common presentation of uterine fibroid is with menorrhagia, mass abdomen, pain, pelvic pressure symptoms, and infertility.⁴⁻⁷ In case of pregnancy, there is increased probability of cesarean section.⁸

There are different treatment options for the management of fibroids. These include conservative management, medical management, surgery and UAE. Uterine artery embolization is the upcoming promising treatment option for management of fibroids. It saves the patient from surgical incision and comorbidities.^[9]

UAE can be used as palliative treatment for managing tumor related symptoms by reducing the size of tumor. It also decreases the tumor vascularity hence addresses the volume loss of abnormal uterine bleeding. UAE treats fibroid related menorrhagia, pelvic pain, abdominal distention and urinary pressure symptoms.^[10]

Contraindication for UAE is current pregnancy, pelvic inflammatory disease, very large size of uterus, pedunculated fibroids and other gynecological pathologies for example adenomyosis and neoplastic conditions. Considering the above mentioned conditions close cooperation between gynecologist and interventional radiologist is recommended.^[11]

Pre-embolization assessment of uterine size, number, location and size of fibroid is done followed by post-embolization assessment. This is done by pre-embolisation cross sectional imaging either with ultrasound or magnetic resonance imaging (MRI).^[9] Location and vascularity of fibroid have prognostic importance for UAE procedure.

MRI is the preferred but costly cross sectional imaging modality to demonstrate presence, number, size, location, internal character and vascularity of fibroid. It has better inter / intra observer reproducibility and multi echo, multi-planner capabilities.^[12]

Cross sectional imaging with MRI also gives information regarding internal character and vascularity of fibroids due to signal variability on different MR sequences. It also determined other uterine pathology causing abnormal uterine bleeding for example adenomyosis Jha et al described the prognostic importance of location and vascularity of fibroid for UAE. Mizukami et al demonstrated that intermediate / high signals within fibroid on T2W sequence on MR imaging have better prognosis after embolization^[13,14].

MATERIALS AND METHODS

This descriptive cross sectional study was conducted at Interventional Radiology suit Radiology Department Surgical Tower Mayo Hospital Lahore and Gynaecology department, Services Hospital, Lahore. Patients were referred for UAE from constituent Gynae hospitals of KEMU and Services Hospital Lahore. The study was conducted from 15-05-2019 to 14-11-2020.

Inclusion Criteria:

1. Single fibroid ≤ 10 cm
2. Normal complete blood count
3. Normal renal profile

Exclusion Criteria:

- 1 Multiple fibroids
2. Adenomyosis
3. Uterine pathology other than fibroid

Data Collection: Patients were selected after fulfilling the inclusion criteria. Written informed consent was obtained from the patients after explaining them the whole procedure, complications and expected outcome. Patients were recruited for the study from constituent Gynae hospitals of KEMU and Services Hospital Lahore and were referred to Interventional Radiology suit Radiology Department Surgical Tower Mayo Hospital Lahore. Pre procedure abdominopelvic ultrasound and MRI was done for all patients to assess size, number, location, vascularity of fibroid, overall uterine size and to rule out any other gynecological pathology (adenomyosis, neoplasia) who are contraindicative for procedure. Data was collected on a predesigned performa. Patients with multiple fibroids, gynecological malignancies, adenomyosis were excluded from the study. 37 patients who fulfilled the inclusion criteria were included in the study. Patients

were briefed about the procedure. This procedure was performed on GE bi planner angiography machine. Material required for the procedure included 5F sheath, 4/5 Fr catheter, micro catheter, 0.035, 0.018, 0.014 guidewire, embosphere 500 micron, percutaneous closing material. By Seldinger's technique arterial access was obtained through right femoral artery. A non-selective pelvic angiogram was performed to map out pelvic arteries including both uterine, ovarian, lumbar and collateral arteries supplying uterine fibroid and to find out arterial variants. The spiral arteries arising from both uterine arteries anastomose across midline and supplies fibroid, therefore both uterine arteries were thrombosed. First left uterine artery was catheterized by transaorta approach and thrombosed with embosphere 500 micrometer. Afterward same procedure was repeated in order to thrombose right uterine artery. Embolic agent (embosphere 500 micron) was diluted appropriately during procedure and catheter was flushed to minimize the risk of catheter occlusion. A complete pelvic angiogram was performed after both uterine arteries were thrombosed to confirm the complete thrombosis of uterine arteries. Patients experienced pelvic pain, cramping, nausea, vomiting for 2 to 5 days after the procedure..

RESULTS

UAE procedure was performed on 37 patients. Average age of patients was 34.9 years while average pre procedure fibroid size was 6.4 cm. Table :1

Out of 37 patients UAE procedure could not be completed in 4 patients. In one of these patients procedure was abandoned due to extreme anxiety and non-cooperation while 3 had arterial spasm resulting in cancellation of procedure. Remaining 33 patients were followed for a period of one year by ultrasound and MRI. There was complete necrosis of fibroids in 25 patients and 3 patients conceived during this follow up period. In 6 patients symptoms were relieved but there was partial necrosis of fibroids. 4 of these patients had calcified fibroids and in 2 patients size of fibroid was more than 8 cm. In 2 patients there was failure of the procedure. Table: 2

These 8 patients had to undergo myomectomy within 6 months of the procedure. Table :3.

The average hospital stay after UAE was 24 hours and after myomectomy was 72 hours.

Table No.1: Pre-Procedure fibroid size and ages of patients

Statistics	Age years	Pre-procedure fibroid size (cm)
n	37	37
Mean	34.97	6.489
SD	6.256	1.64
Minimum	21.00	4.00
Maximum	47.00	10.00

Table No.2: Post-procedure fibroid outcome

Outcome	Frequency		Percentage (%)
	Partial Necrosis	> 8.0 cm	
Calcified Fibroid		4	
Complete necrosis	25		75.75
Failure of procedure	2		6.06
Total	33		100

Table No.3: Follow-up of post procedure patients

		Frequency (n)	%age
Follow up	Myomectomy	8	24.24
	Uneventful recovery	25	75.75
	Total	33	100.0

DISCUSSION

In 1995 Ravina et al reported first use of embolization to reduce intra operative blood loss during myomectomy and approximately 13000 to 14000 UAE are performed per year in USA.^[15,16]

Initial studies showed that after successful UAE for menorrhagia the reduction in menstrual loss is 90 to 92% and relief in symptoms is 88 to 96% after one year of follow up.^[17,18]

Two randomized studies compared UAE and surgical outcome. EMbolization versus hysterectomy (EMMY) and the Randomized Trial of Embolization versus Surgical Treatment for Fibroids (REST) trial.^[19,20,21,22]

The EMMY trial was multi centric randomized control trial that compared UAE and hysterectomy in 177 patients. The REST trial was multi centric randomized trial in which 149 patients underwent surgery hysterectomy/ myomectomy or UAE. In the REST trial patient who underwent UAE had quick recovery but more chances of redo of UAE [13% at 12 months, 32% after 6 months] due to incomplete infarction of fibroid resulting in recurrence of symptoms however both REST and EMMY trials provided similar results for example relief from symptoms, quality of life and patient satisfaction. Same thing happened in our study. 8 of the patient had to undergo myomectomy as there was complete failure of procedure in 2 patients and partial necrosis of fibroid in 6 patients. Similar results were shown by Manyonda IT et al, who concluded the study by stating that chances of re intervention are there after UAE but in those patients UAE is successful, the hospital stay is short with lesser comorbidities.^[23] In EMMY and REST trials average hospital stay was 2 days for UAE and 6 days for surgery, indicative of quick recovery. In our study the average hospital stay after UAE was 24 hours and after myomectomy was 72 hours.

CONCLUSION

UAE is first line management option for uterine fibroid as it is safe, effective with short hospital stay and few major complications as compared to surgical procedure. It is minimal invasive uterine sparing radiological interventional procedure.

Author's Contribution:

Concept & Design of Study: Wajid Ali
 Drafting: Bushra Haq, Awais Ahmad
 Data Analysis: Tabeer Malik, Rabia Akram, Shahid Malik
 Revisiting Critically: Wajid Ali, Bushra Haq
 Final Approval of version: Wajid Ali

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Buttram VC, Jr, Reiter RC. Uterine leiomyomata: etiology, symptomatology, and management. *Fertil Steril* 1981;36(4):433–45.
- Day Baird D, Dunson DB, Hill MC, Cousins D, Schectman JM. High cumulative incidence of uterine leiomyoma in black and white women: ultrasound evidence. *Am J Obstet Gynecol* 2003;188(1):100–107.
- Gomez E, Nguyen MT, Fursevich D, Macura K, Gupta A. MRI-based pictorial review of the FIGO classification system for uterine fibroids. *Abdom Radiol (NY)* 2021;46(5):2146–2155.
- Gambone JC, Reiter RC, Lench JB, Moore JG. The impact of a quality assurance process on the frequency and confirmation rate of hysterectomy. *Am J Obstet Gynecol* 163(2):545–50.
- Amirikia H, Evans TN. Ten-year review of hysterectomies: trends, indications, and risks. *Am J Obstet Gynecol* 1979;134(4):431–7.
- Parker WH. Etiology, symptomatology, and diagnosis of uterine myomas. *Fertil Steril* 2007;87(4): 725–736.
- Pritts EA. Fibroids and infertility: a systematic review of the evidence. *Obstet Gynecol Surv* 2001;56(8):483–91.
- Stout MJ, Odibo AO, Graseck AS, et al. Leiomyomas at routine second-trimester ultrasound examination and adverse obstetric outcomes. *Obstet Gynecol* 2010;116(5):1056–1063.
- Marshburn PB, Matthews ML, Hurst BS. Uterine artery embolization as a treatment option for uterine myomas. *Obstet Gynecol Clin North Am* 2006;33(1):125–44.
- Lupattelli T, Clerissi J, Basile A, Minnella DP, Sarti RD, Gerli S, Renzo GD. Treatment of uterine fibromyoma with bilateral uterine artery

- embolization: state of the art. *Minerva Ginecol* 2007 Aug;59(4):427-39.
11. Zurawin RK, Fischer JH, Amir L. The effect of a gynecologist-interventional radiologist relationship on selection of treatment modality for the patient with uterine myoma. *J Minim Invasive Gynecol* 2010;17(2):214-21
 12. Reinhold C, McCarthy S, Bret PM. Diffuse adenomyosis: comparison of endovaginal US and MR imaging with histopathologic correlation. *Radiol* 1996;199(1):151-8.
 13. Jha RC, Imaoka I, Ascher SM. MR imaging of uterine artery embolization for leiomyomas: morphological changes and features predictive of response [ab]. *Radiol* 1999;213(P):347-51.
 14. Mizukami N, Yamashita Y, Matsukawa T. The value of MR imaging in predicting the treatment effect of arterial embolization therapy for uterine leiomyomas [ab]. *Radiol* 1999;213(P):348.
 15. Ravina JH, Bouret JM, Fried D. [Value of preoperative embolization of uterine fibroma: report of a multicenter series of 31 cases]. *Contracept Fertil Sex* 1995;23(1):45-9.
 16. Society of Interventional Radiology. Uterine Fibroid Symptoms, Diagnosis and Treatment. Society of Interventional Radiology. Available at <http://www.sirweb.org/patients/uterine-fibroids/>. Accessed May 6, 2009.
 17. Hutchins FL Jr, Worthington-Kirsch R, Berkowitz RP. Selective uterine artery embolization as primary treatment for symptomatic leiomyomata uteri. *J Am Assoc Gynecol Laparosc* 1999;6(3):279-284.
 18. Walker W, Green A, Sutton C. Bilateral uterine artery embolisation for myomata: results, complications and failures. *Min Invas Ther & Allied Technol* 1999;8(6):449-454.
 19. U.S. National Library of Medicine. Emmy Trial: Uterine Artery Embolization (UAE) Versus Hysterectomy for Uterine Fibroids. ClinicalTrials.gov identifier: NCT00100191. Available at <https://clinicaltrials.gov>. Last updated, 2005.
 20. Hehenkamp WJ, Volkers NA, Donderwinkel PF, et al. Uterine artery embolization versus hysterectomy in the treatment of symptomatic uterine fibroids (EMMY trial): peri- and post-procedural results from a randomized controlled trial. *Am J Obstet Gynecol* 2005;193(5):1618-1629.
 21. Edwards RD, Moss JG, Lumsden MA, et al. Uterine-artery embolization versus surgery for symptomatic uterine fibroids. *N Engl J Med* 2007;356(4):360-370.
 22. Moss JG, Cooper KG, Khaund A, et al. Randomised comparison of uterine artery embolisation (UAE) with surgical treatment in patients with symptomatic uterine fibroids (REST trial): 5-year results. *BJOG* 2011;118(8):936-944.
 23. Manyonda IT, Bratby M, Horst JS, Banu N, Gorti M, Belli AM. Uterine artery embolization versus myomectomy: impact on quality of life—results of the FUME (Fibroids of the Uterus: Myomectomy versus Embolization) Trial. *Cardiovasc Intervent Radiol* 2012;35(3):530-536.