

# Uterine Artery Embolization for Symptomatic Fibroids Uterus in Gaza

Mohammed Salama, Mohammed Habib\*

Cardiology Department, Alshifa Hospital, Gaza, Palestine, Israel

## ABSTRACT

**Background:** To evaluate interventional success, clinical success, and reduction of fibroid diameter after uterine artery embolization (UAE) for patients with symptomatic fibroid uterus in Gaza. **Methods:** Retrospective study of thirty-two women with symptomatic uterine underwent uterine magnetic resonance imaging (MRI) before and 6 months after UAE. Primary outcome: clinical success is the improvement of the patients presenting symptoms, such as menorrhagia or pain without additional therapy. Secondary outcome: interventional success is a complete occlusion in both uterine arteries and reduction measures of fibroid diameter after 6 months after embolization. **Results:** Of 32 patients with mean age  $44 \pm 7.6$  years and follow-up between 6-70 months, 30 (93.7%) patients completed follow-up, 1 (3 %) patient had a second procedure, and 2 (6 %) were lost to follow-up. Primary outcome: the improvement of symptoms, such as menorrhagia or bulk-related pain without additional therapy was seen in 29 (90%) patients. one patient underwent surgery hysterectomy 14 months after UAE-related complaints and failure of conservative treatment and 2 patients still received therapy to control symptoms. interventional success is a complete occlusion in both uterine arteries was seen in 31 (97%) patients. The mean dominant fibroid diameter reduced from  $6.2 \pm 2.4$  cm to  $1.7 \pm 1.44$  cm ( $p = 0.001$ ). **Conclusions:** Uterine artery embolization significant improvements in fibroid uterus symptoms and long-term follow-ups with low complication rates and very good clinical efficacy.

**Keywords:** Uterine Artery Embolization, Symptoms, Fibroids, Patients.

## INTRODUCTION

Fibroid Uterus, the most common type of tumor among women of reproductive age, and increases with age [1,2]. This tumor is associated with menstrual bleeding, abdominal pain, and reduced quality of life [3]. After failed medical treatment for women who wish to preserve their uterus myomectomy and uterine artery embolization are therapeutic options. Surgery, either myomectomy or hysterectomy, has traditionally been the primary approach for the management of symptomatic fibroids. Transcatheter uterine artery embolization (UAE) for fibroid uterus

## Vol No: 07, Issue: 01

Received Date: March 10, 2023

Published Date: April 04, 2023

### \*Corresponding Author

Mohammed Habib, MD, PhD

Cardiology Department, Alshifa Hospital, Gaza, Palestine, Israel, Tel: 00972599514060

E-mail: cardiomohammad@yahoo.com

**Citation:** Habib M, et al. (2023). Uterine Artery Embolization for Symptomatic Fibroids Uterus in Gaza. Mathews J Gynecol Obstet. 7(1):25.

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treatment was reported by Ravina in 1995 [4]. Uterine-artery embolization, usually performed under local anesthesia, involves occlusion of the bilateral uterine arteries supplying the uterus by using biocompatible particles, to cause ischemic infarction of the fibroids. As compared with myomectomy, uterine-artery embolization is associated with a shorter hospital stay and an earlier return to normal activities [5,6]. Several registries and non-randomized clinical trials have supported UAE in symptomatic women with menorrhagia, as an alternative to hysterectomy. The present retrospective clinical trial is the first trial reported in the Gaza Strip to document the efficacy and safety of UAE for the treatment of symptomatic uterine fibroids.

## METHODS

### Patient population

Retrospective analysis between October 2016 and July 2022. The total 32 patients were undergoing of UAE for symptomatic fibroid uterus in Alshifa hospital and al-Hayat hospital in Gaza, The indication for UAE was established by gynecologists after clinical examination and confirmation of the diagnosis by transvaginal ultrasound. MRI diagnosis was done before and 6 months after procedures for all patients.

### Embolization technique

a Foley catheter is placed into the bladder before the procedure to prevent discomfort during and post-procedure. Intravenous normal saline with 100 cc/hour to keep open IV line and in order to administer medication when necessary. Local analgesics with Lidocaine 1 % should be administered before puncturing the common femoral artery. Bilateral embolization was performed by an interventional cardiologist with experience in embolization procedures using a trans-femoral approach. In most patients, both uterine arteries were accessed consecutively via a common femoral artery approach. Both common femoral arteries were punctured and embolization of the uterine arteries was performed via catheters placed in the uterine arteries in a crossover technique. Catheterization and embolization were performed by using 6F right Judkins catheters and coaxially placed microcatheters. The catheter was positioned in the horizontal segment of the uterine artery distal to angiographically visualized cervicovaginal branches. Embolization was achieved by polyvinyl alcohol particles

in 31 patients (500–700 and 700–900  $\mu\text{m}$ .) and in 1 patient by coils due to uterine AV malformation in additionally to fibroid uterus. During embolization patients received intravenous non-steroidal anti-inflammatory drugs or mild conscious sedation with (usually up to 50-100 micrograms) fentanyl and (5 mg of) midazolam for pain control and were admitted for observation (6-12 hours) before discharge, at discharge all patients were received anti-inflammatory drugs, antibiotics, and proton pump inhibitors for five days.

### Outcome Definitions

Primary Outcome (Clinical success): is the resolution or satisfactory improvement of the patients presenting symptoms, such as menorrhagia or bulk-related pain, bloating, urinary urge, or constipation, without additional therapy.

### Secondary outcome

1. Interventional success: is a complete occlusion in both uterine arteries. Successful embolization of only one uterine artery is considered an interventional failure unless only a single uterine artery is present.
2. Reduction of fibroid diameter: measurement of fibroid diameter before the procedure and after the procedure by MRI.

**Complication (Post-embolization syndrome):** the occurrence of pelvic pain, low-grade fever, nausea, vomiting, loss of appetite, and malaise in the first few days after UAE.

### Statistical analysis

All patients who completed follow-ups were eligible for further analysis. The age and fibroid diameter were calculated by mean+ SD. Follow-up of fibroid Diameter before and after 6 months measurement by paired T-test. Statistical significance was accepted at  $P < 0.05$ . Statistical analysis was performed using the SPSS software package (SPSS 21 version; SPSS Corporation, Chicago, USA).

## RESULTS

Thirty -two consecutive patients (mean age, 44.1+7.6 years; range, 28–53 years) underwent uterine artery embolization (Table 1). Embolization was performed with 500–900  $\mu\text{m}$  polyvinyl alcohol particles. A 6-month imaging follow-up by MRI was available in 27 patients and clinical follow-ups between 6-70 months in 30 patients were recorded.

**Table 1.** Baseline Data of the study population.

Demographic characteristics All	(n = 32)
Age [mean +SD]	44.1+7.6
Post-menopausal	2(6%)
Presenting symptoms	
Menorrhagia	16 (50%)
Bulk symptoms	4(12.5%)
Both	12(37.5%)
Diameter Of fibroid	6.2 ± 2.4 cm
Number of fibroids	
Single	10(31%)
Multiple	22 (69%)
Location of dominant fibroid	
Subserosal	2(6 %)
Intramural	21(66%)
Submucosal	9 (28%)

Sixteen patients presented with menorrhagia, four had bulk-related symptoms (abdominal distension, stress incontinence, pelvic pain), and 12 had both. Interventional success for bilateral embolization was in 31 patients 97%. All patients were discharged to home 6–8 hours after the procedure. Complications reported symptoms included pelvic pain/cramping first 24 hours in 47 % (15 of 32), nausea/vomiting in 34.4% (11 of 32), and no purulent vaginal discharge in 6% (2 of 32). These symptoms were satisfactorily controlled with discharge medications. No patients returned to the hospital or visited an emergency room during the first 48 hours after discharge. One patient undergo a surgery hysterectomy 14 months after UAE-related complaints and failure of conservative treatment a significant reduction in dominant fibroid diameter was seen after 6 months after UAE. The mean dominant fibroid diameter reduced from 6.2 ± 2.4 cm to 1.7± 1.44 cm (p = 0.001).

## DISCUSSION

Uterine fibroids are clinically apparent in 25% of women of reproductive age, myomectomy or hysterectomy has traditionally been the primary approach for the management of symptomatic fibroids, many patients would like to avoid major surgery and look for permanent alleviation of symptoms rather than the surgical cure for this benign disease. In our trial the overall incidence of complications associated with UAE was low; the median length of hospital stay was less than 1 day with uterine-artery embolization. In our trial interventional success for bilateral embolization

was 97%. All patients were discharged to home 6–8 hours after the procedure, only one patient undergo surgery hysterectomy 14 months after UAE-related complaints and failure of conservative treatment significant reduction were seen in the mean dominant fibroid diameter, and no mortality was reported.

Most of the studies included in our trial suggested the use of UAE as an important tool in the treatment of fibroid uterus. The procedure is an effective therapy for women with heavy menstrual bleeding who were resistant to other conservative therapies. The REST study: Randomized comparison of UAE versus surgery (myomectomy and hysterectomy) in 157 women with symptomatic fibroid uterus. The randomization was 2:1 (106 UAE and 51 surgeries) and a long follow-up of 5 years. The improvement in quality of life was similar in both groups [7].

The FUME study [6] fibroid uterus for Myomectomy versus Embolization, the quality of life in patients following UAE or myomectomy performed for uterine fibroids in a prospective cohort trial. The outcomes during a follow-up period of 5 years showed similar results regarding significant improvement in quality of life.

The EMMY study: Embolization vs. Hysterectomy was a multicentric randomized controlled trial conducted between 2002 and 2004 which included 177 patients with symptomatic fibroid uterus. The study population was randomized to 81 UAE and 75 hysterectomies with the goal of comparing the outcomes and quality of life 10 years after the procedure [8,9]. In this trial, UAE is a well-documented

valuable treatment alternative for surgery in the treatment of patients with symptomatic fibroids in terms of quality of life

In the FEMME trial [10] Perioperative and postoperative complications occurred in 29% of the women in the myomectomy group and in 24% of the women in the uterine-artery embolization group but patients who underwent myomectomy had a better fibroid-related quality of life at 2 years than those who underwent uterine-artery embolization.

## CONCLUSIONS

After failed medical treatment for women with fibroid uterus who wish to preserve their uterus UAE, it is an alternative to myomectomy. A 3 % hysterectomy rate has to be expected during follow-up after successful embolization. In the short-term, UAE had lower blood loss, shorter hospital stays and quicker resumption of work. Every symptomatic patient with uterine myomas should be offered UAE as an alternative treatment to myomectomy.

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