



Uterine artery embolization for symptomatic fibroids in postmenopausal women



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ABSTRACT

Purpose: The aim of the current study was to evaluate the efficacy of uterine artery embolization (UAE) for symptomatic fibroids in postmenopausal women.

Materials and methods: Among 900 cases who underwent UAE between 2007 and 2013, a total of 9 postmenopausal women with symptomatic fibroids ($n=6$) and fibroid with adenomyosis ($n=3$) were included in this retrospective study. Ages ranged from 49 to 55 years (median of 52). The embolic agent was nonspherical polyvinyl alcohol particles. We evaluated 18 uterine arteries in nine patients and compared the size of the uterine artery relative to inferior mesenteric artery (IMA) in preprocedural magnetic resonance (MR) angiography. Magnetic resonance imaging (MRI) was performed before and 3 months after UAE. Predominant fibroid and uterine volumes were calculated from MR images.

Results: Urinary frequency was the most common symptom, observed in seven patients (77.8%). Of two patients (22.2%) with vaginal bleeding from submucosal myomas, one patient had been on hormone replacement therapy (HRT). One patient underwent UAE due to growing leiomyoma after HRT. All of the 18 uterine arteries were bigger than the corresponding IMAs in MR angiography. Contrast-enhanced MRI revealed complete necrosis of the predominant fibroid in all patients. Eight (88.9%) of the nine participants demonstrated resolution of symptoms. The mean predominant fibroid and uterine volume reduction rates were 39.7% and 36.9%, respectively.

Conclusions: In postmenopausal women, UAE was effective to treat symptomatic fibroids, and it could be considered as an alternative treatment to hysterectomy.

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1. Introduction

Uterine fibroids, the most common solid tumors of the female genital tract, develop in 20–40% of women [1,2]. Even though uterine artery embolization (UAE) is rapidly gaining acceptance as an effective alternative to hysterectomy and myomectomy [3–6], UAE is generally not recommended for the treatment of fibroids in postmenopausal women because regression of the uterine fibroid is expected. There are, however, some postmenopausal women who have continuing symptoms or, specifically, who develop symptoms while taking hormone replacement therapy (HRT) [7–9]. Therefore, reaching menopause can no longer be seen as the end of fibroid development in some patients. Additional factors need to be considered, e.g., postmenopausal women have different clinical settings than premenopausal women. The size of the uterine artery (UA) may be a concern in performing UAE, as uterine volume is significantly decreased after menopause [10].

There have been few reports of effectiveness of UAE for management of symptomatic fibroids in postmenopausal women [11,12]. The purpose of the current study is to evaluate the efficacy of UAE for

symptomatic fibroids or adenomyosis in postmenopausal women and to describe the clinical characteristics.

2. Materials and methods

The institutional review board of our institution approved this retrospective study.

2.1. Participants in the study

A total of 900 cases underwent UAE for symptomatic fibroid or adenomyosis between 2007 and 2013 in our institute. Of these, a total of 9 postmenopausal women who met the Stages of Reproductive Aging Workshop criteria for menopause, defined as 12 months of amenorrhea after the final menstrual period, were enrolled in the present study [13]. Patient demographics are summarized in Table 1.

Among nine patients, fibroids ($n=6$) and fibroids with adenomyosis ($n=3$) were diagnosed based on magnetic resonance imaging (MRI). Patients' ages ranged from 49 to 55 years (median of 52). Duration of menopause before procedure ranged 1–7 years (median 4 years). Mean follow-up period was 11 months (range of 6–18 months). The mean diameter of predominant fibroids was 6.21 ± 1.8 cm. Seven women presented with bulk-related fibroid symptoms, and two patients presented with vaginal bleeding. All patients were primarily cared for by

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Table 1
Patient demographics (n=9)

Age range (years)	49–55 (median, 52)
Mean follow-up period (months)	4 (3–9)
Median duration of menopause before procedure (years)	4 (1–7)
HRT	2
Symptoms	
Bulk-related symptoms	7
Urinary frequency	6
Pelvic heaviness	4
Palpable mass	2
Bleeding	2
MRI	
Fibroids	6
Fibroid and adenomyosis	1
Adenomyosis	2
Mean diameter of the predominant fibroid (cm)	6.21±1.84

an interventional radiologist, who also conducted the clinical follow-up. Procedures were performed at the tertiary university hospital.

2.2. MRI

All patients underwent preoperative MRI using a 3-T Signa HD/HDX (GE Healthcare; Milwaukee, WI, USA). Follow-up MRI at 3 months after UAE was recommended as routine clinical care. For contrast-enhanced magnetic resonance (MR) angiography, the Time Resolving of Contrast KineticS technique was used. A dose of 10 ml meglumine gadoterate (Dotarem; Guerbet, Villepinte, France) was administered at a flow rate of 2.5 ml/s, followed by 25 ml saline with the same injection parameters. Uterine volume was calculated by the volume equation for a prolate ellipse (length×width×height×0.5233) using measurements from the images [14].

2.3. Angiographic procedures

Unilateral right femoral artery access was used in all cases. A 5.0-F RHR catheter (Cook; Bloomington, IN, USA) was then placed in the internal iliac artery, and a Renegade microcatheter (Boston Scientific; Natick, MA, USA) was advanced into the UA. The embolic agent was non-spherical polyvinyl alcohol (PVA) particles (Contour, Boston Scientific; Natick, MA, USA) mixed with 60 ml of a 1:1 saline solution:contrast agent mixture. All patients underwent embolization initially with 355- to 500- μ m PVA particles, followed by 500- to 700- μ m PVA particles. Embolization was performed until complete cessation of blood flow was achieved in the ascending and transverse segment of the UA for 10 cardiac beats.

2.4. Size of the UA

We evaluated 18 UAs in the 9 study participants and compared the size of the UA relative to inferior mesenteric artery (IMA) in preprocedural MR angiography. The UAs were categorized into three groups: bigger than, same as, or smaller than IMA.

2.5. Clinical follow-up

Follow-up examination consisted of an outpatient visit and MRI 3 months after UAE. We evaluated if the patient still had symptoms or experienced a resolution of symptoms after the procedure. We classified complications from UAE into six grades, as previously reported [9,10]: grade A=no therapy, no consequence; grade B=nominal therapy, observation, no consequence; grade C=required therapy, unanticipated minor hospitalization (<48 h); grade D=major therapy, unplanned increased level of care, unanticipated prolonged hospitalization (>48 h); grade E=permanent adverse sequelae; and grade F=death. Grades A

and B were defined as minor complications, and grades C through F were defined as major complications.

2.6. Statistical analysis

Wilcoxon signed-rank test was used to compare effects of UAE on reduction of mean volumes of predominant fibroid and uterus. Differences were considered statistically significant when P was <.05.

3. Results

The outcome of treatment by UAE in postmenopausal patients is summarized in Table 2. Seven patients had pressure symptoms including urinary frequency, pelvic heaviness, or palpable mass (Fig. 1). Two patients were treated by HRT; one became menopausal 3 years previously, experienced intermittent vaginal bleeding after 5 months of HRT, and presented submucosal myomas. The second patient entered menopause 7 years previously; she had been treated by HRT for 5 years, but recent growth of a myoma had led to urinary symptoms.

Eight (88.9%) of nine patients demonstrated resolution of symptoms, and one patient demonstrated about 20% reduction in volume of predominant fibroid with little improvement in urinary symptoms, even if fibroids were completely infarcted at the 3-month follow-up MRI.

The volume reduction rate of the uterus and the predominant fibroids after UAE were 39.7% and 37.0%, respectively.

All of the 18 UAs were bigger than the corresponding IMAs in MR angiography. Catheterization of UAs was successful in all cases. One patient had minor (grade A) complications, and she experienced spontaneous vaginal passage of a submucosal fibroid.

4. Discussion

Uterine fibroids are dependent upon the sexual steroid hormone (estrogen and progesterone); thus, they are expected to be resolved in women postmenopausally, when there is much less estrogen and progesterone in the body [3,15]. Therefore, health care providers have counseled patients that leiomyomas are a self-limiting problem that will resolve when a woman completes the transition to menopause. However, several studies have reported that some postmenopausal women may have continuing symptoms of the fibroid or growth of the fibroid even in menopause. Additionally, postmenopausal women undergoing HRT have been observed to develop symptoms of bleeding or growth of the fibroid or even development of new fibroids [8,9,16,17]. Indeed, an onset of new leiomyomas was observed in 5% of previously leiomyoma-free postmenopausal women after HRT [16].

The effect of HRT on uterine fibroid size is controversial because few data are available.

Table 2
Outcomes of UAE in postmenopausal women (n=9)

Characteristics	Number
Size of the UA relative to that of IMA	18
Bigger	18
Same	0
Smaller	0
Complete necrosis of the fibroid or adenomyosis	9/9 (100%)
Resolution of symptoms	8/9 (88.9%)
Uterus (n=9)	
Mean volume before treatment (cm ³)	389.79±166.35
Mean volume after UAE (cm ³)	246.53±113.87
Volume reduction rate	39.74% (P=.008*)
Predominant fibroid (n=7)	
Mean volume before treatment (cm ³)	125.17±78.94
Mean volume after UAE (cm ³)	74.49±54.24
Volume reduction rate	36.98% (P=.018*)
Vaginal passage of the fibroid	1

* Wilcoxon signed-rank test.

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