

## Symptoms Improvement after Uterine Artery Embolization for Myomas Management

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### Abstract

**Background:** Management of uterine myomas aims at improving symptoms that can be a problem and interfere in the patient's quality of life. Less invasive approaches, such as uterine artery embolization (UAE), for selected patients is supposed to be a safer choice.

**Methods:** Thirty-one women (mean age  $38.5 \pm 5.9$ ) with symptomatic uterine myomas underwent UAE. All them scored 0 (mildest) to 10 (worst) for discomforting symptoms (abdominal pain (cramping) during and out of menstrual periods; bleeding during and out of menstrual periods; discomforting abdominal swelling; pain during sexual intercourse; general discomfort in diary activities and in social activities) before and 90 days after UAE.

**Results:** Mean scores before and 90 days after UAE were significantly different for all symptoms, except for pain in sexual intercourse. Scores for bleeding out of menstrual periods increased after UAE, and decreased for all the other symptoms. Total scores before management ( $43.8 \pm 25.4$ ) decreased significantly ( $p < 0.001$ ) three months after UAE ( $16.1 \pm 22.6$ ).

**Conclusion:** Clinical outcomes from UAE were very positive for this group of women, especially those presenting higher mean scores for abdominal pain and bleeding during menstrual periods.

**Keywords:** Myomas; Uterine artery embolization; Endovascular surgery

### Introduction

The most common benign, solid, pelvic tumors in women are the uterine myomas that can develop slowly over several years or rapidly over several months. They occur in 20%-40% of women in reproductive years and in 80% of women during life [1]. Most women have no or mild symptoms, and never need treatment, but reassurance and careful follow up. For about 30% of them, however, symptoms can be a problem and interfere in their quality of life [2].

The type and intensity of symptoms can depend on the location, size and number of fibroids in the uterus. Such problematic symptoms include pelvic pain and pressure, abnormal menstrual bleeding, urinary problems, difficulty or pain with bowel movements, infertility, and problems with pregnancy (including placental abruption and premature labor). Although uterine myomas generally are not dangerous, they can cause diverse levels of discomfort and may lead to complications such as anemia from heavy blood loss.

Despite the frequency with which myomas are diagnosed and treated, the best management remains uncertain and controversial. Many factors affect the choice of the best therapeutic modality, including age, parity, childbearing aspirations, extent and severity of symptoms, size, number and location of myomas, associated medical conditions, and the risk of malignancy, proximity to menopause, and the desire for uterine preservation [3]. Hence, the treatment should be individualized. Treatment modalities for symptomatic uterine myomas include medical therapy (first choice), conventional hysterectomy or myomectomy (appropriate indications) and less invasive approaches, such as uterine artery embolization (UAE), for very carefully selected patients [4].

The UAE was first described for management of myomas in 1995, in an attempt to prevent growth by limiting the blood supply [5]. This interventional radiologic procedure is recommended for large symptomatic myomas in women who do not wish or are poor candidates for major surgery and requires a short hospital stay and. It was already associated with fewer serious adverse effects than hysterectomy and similar rates of satisfaction [6], reduced fibroid-related menstrual blood loss by 85% and dominant fibroid volume by 30%-46% [7], and improved quality of life [8].

The literature on the quality of life (QoL) assessment of women with uterine myomas is still limited [9,10]. The Uterine Fibroid Symptom and Quality of Life (UES-QoL) is the only condition-specific questionnaire available so far [11], and its more time-consuming application is not adequate to assess symptoms improvement after management of uterine myomas. We analyzed the changes of the eight most discomforting symptoms after UAE using a simple Likert scale.

### Materials and Methods

Thirty-one women (28 to 50 years old,  $38.5 \pm 5.9$ ) with symptomatic uterine myomas adequately selected underwent UAE between

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November 2013 and October 2015. All they scored 0 (mildest) to 10 (worst) for eight discomforting symptoms of uterine myomas before and 90 days after UAE. The assessed symptoms included: abdominal pain (cramping) during menstrual period; abdominal pain out of menstrual periods; bleeding during menstrual period; bleeding out of menstrual periods; discomforting abdominal swelling; pain during sexual intercourse; general discomfort in diary activities; general discomfort in social activities.

It was included in this study only technically successful procedures performed with the same technique as follows.

Antibiotic prophylaxis with azithromycin 1.0 g was orally administered 24 hours before the procedure. Procedures started with epidural anesthesia with intravenous cephalexin 2.0 g associated with conscious sedation. For the first 24 hours after procedure patients were given cephalexin 1.0 intravenously every 6 hours. After careful bilateral inguinal asepsis, access for the procedure was from the right groin via the right common iliac artery (Seldinger technique), using a 5-Fr catheter. Contralateral access was reserved exclusively for technical difficulties with unilateral access or for reducing ovarian irradiation. Abdominal angiography at the level of renal arteries was performed to assess both the arterial supply of the uterus via uterine arteries and the anomalous arterial supply. Contralateral common iliac artery was selectivated, catheter was replaced for a diagnostic one, and road map is performed in angulation of 45°. Uterine artery was catheterized using a microcatheter from the first or second branch of the anterior trunk of the internal iliac artery in order to avoid dissection, spasms or even failure of catheterization. The selectivation of the uterine artery was demonstrated by careful angiography. Polyvinyl alcohol particles of 500 µm were used for the uterine artery embolization. After the embolization of the contralateral uterine artery, the same procedures are performed in the ipsilateral uterine artery with retrograde catheterization and formation of a Waltman's loop. At the end of embolization, new abdominal angiography at the level of renal arteries was performed for ruling out the presence of parasite vascularization. The catheter was removed, and the puncture site was effectively compressed.

Scores attributed to the intensity of symptoms before and after UAE transformed in means and standard deviations were compared using the *t* Student Test. The frequencies of improvement of symptoms were compared using the Qui-square Test.

## Results

Mean scores (0 to 10) attributed by the patients to the intensity of symptoms before and 90 days after UAE were significantly different for all symptoms, except for pain in sexual intercourse (Figure 1). Scores for bleeding out of menstrual periods increased after UAE, and decreased for all the other symptoms.

The most discomforting symptoms reported by the patients before treatment (bleeding during menstrual period, discomforting abdominal pain, and abdominal pain during menstrual periods) were those with more significant improvement.

Total scores before management ( $43.8 \pm 25.4$ ) decreased significantly ( $p < 0.001$ ) three months after UAE ( $16.1 \pm 22.6$ ).

As shown in Figure 2, improvement was more frequently reported by patients concerning bleeding during menstrual periods ( $\chi^2=32.75$ ;  $p < 0.001$ ), abdominal pain during menstrual periods and discomforting abdominal bleeding (respectively,  $\chi^2=20.09$  and  $\chi^2=20.02$ ;  $p < 0.001$ ). On the other hand, patients reported more frequently no changes in abdominal pain and bleeding out of menstrual periods and pain during sexual intercourse, which were the symptoms with lower mean scores before the UAE.

Concerning general discomfort in diary activities or in social activities, patients reported improvement and no changes after management of their uterine myomas in very similar rates. The rates of worsening of symptoms after UAE ranged from 3.2% (one patient) to 9.7%, considering that one same patient reported such worsening for four symptoms (abdominal pain during and out of menstrual periods, discomforting abdominal swelling and pain during sexual intercourse).

## Discussion

The main targets in the management of symptomatic uterine myomas are the reduction of dominant fibroid volume and fibroid-related menstrual blood loss and the improvement of discomforting symptoms that can impact the patient's QoL. The choice of management depends on several objective and subjective factors. Medical therapy should be tried as a first choice, while surgical treatment should be reserved only for appropriate indications, and UAE is an indication for patients ineligible for surgery or those who do not desire to undergo a surgical procedure. The woman's desire for pregnancy and suspicion of

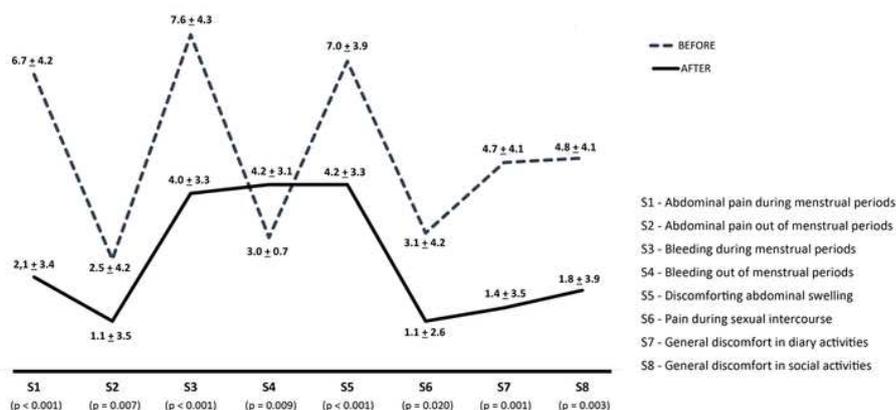
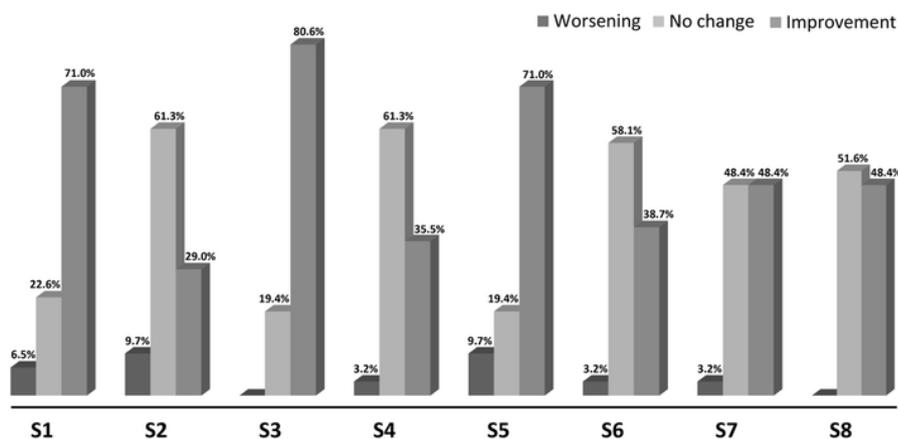


Figure 1: Mean scores (and standard deviations) for uterine myoma symptoms before and 90 days after uterine artery embolization.



**Figure 2:** Frequencies of "improvement", "worsening" or "no changes" in uterine myoma symptoms 90 days after uterine artery embolization.

malignancy before uterine myoma treatment are determining points for surgical choice.

All management options do not avoid the possibility for new myomas to form, and preexisting small or undetected myomas may grow significantly. The recurrence rate in 3 years needing reintervention is of 14.4% [8], and is higher after UAE [12]. Long lasting alleviation of symptoms was evidenced in the clear majority of patients followed for five years after UAE, with probability of 25% for recurrence of symptoms in the same period [13].

Intensity and severity of symptoms are usually assessed in a very subjective way, since can be perceived differently by each woman. For example, some patients can have very intense bleeding and perceive it as a normal menstrual bleeding, while others with very less intense bleeding perceive it as an exaggerated blood loss. The same is observed regarding to abdominal pain and discomforting abdominal swelling. Clinical indicators should be carefully adopted as practical parameters for assessing such symptoms, including presence of anemia, increased use of absorbents each new menstrual period, change of absorbents every two hours or less, progressive increase in the duration of the period, incapacitating pain, and register of embarrassing social situations [14].

Since there is no better objective and easy-applicable evaluation system, we used a Likert scale scored 0 to 10 to assess changes in the intensity of uterine myomas symptoms 90 days after UAE. In this group of 31 women, mean scores decreased significantly for all assessed symptoms, except for pain in sexual intercourse and bleeding out of menstrual periods, whose scores increased instead. There was significant variance in scores regarding less discomforting symptoms perceived by patients (abdominal pain and bleeding out of menstrual periods, pain during sexual intercourse, and general discomfort in diary and social activities) and total mean scores, what probably is explained by the subjective aspect of a Likert scale scoring. Such variance, however, did not differ regarding more discomforting symptoms (abdominal pain and bleeding in the menstrual periods and abdominal swelling), significantly improved after UAE. A more objective symptoms assessment considering even subjective aspects as pain threshold, for example, would help to better understand both the changes in symptomology after UAE and the impact of such changes in the patients' QoL.

The reduction of uterus and myoma volumes becomes evident some weeks after UAE and continues for three to twelve months [15] causing the improvement of symptoms. Maybe an assessment after a longer time than 90 days could reveal little different findings, since in some cases the best reduction of myomas need more time to be effective. This can be the reason why the frequency of equal scores for some symptoms before and after management was higher than the frequency of improvements or very similar.

The fact is that the clinical outcomes from UAE were very positive for this group of women, especially those presenting high mean scores for abdominal pain and bleeding during menstrual periods and discomforting abdominal swelling before this intervention for treating their myomas. Indeed, studies comparing clinical results of myomectomy (open surgery or laparoscopy) and UAE revealed similar clinical success rates [16-19], with advantages for UAE concerning shorter hospital stay and recovery time [20], since adequate indication and successful performance bases on four important aspects: strict definition of the clinical entities involved in the disease and its treatment, careful selection of patients, technique of embolization, and post-surgical management.

## Conclusions

Uterine artery embolization is a safer non-invasive approach with positive impact in the quality of life of women with symptomatic uterine myomas who are not eligible or do not desire to undergo surgical management.

## Authors Disclosure Statement

No competing financial interests exist.

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