

# How effective is The Nonsurgical Management of Uterine Myomas?

## Editorial

Uterine myomas represent a very common clinical entity, especially in young female patients. Approximately 20%-40% of the women at reproductive age have uterine myomas [1-5]. However, their incidence shows a significant decrease in menopause [2-6]. They are benign tumors and usually are asymptomatic. However, sometimes they related with abnormal uterine bleeding, pelvic pain, pressure complaints, infertility and pregnancy-related complications [1-3,5-7].

Nowadays, various treatment protocols have been proposed for patients with uterine myomas. These protocols include either surgical or nonsurgical management [2,3,5-7]. Among them, the surgical management (myomectomy, hysterectomy) of uterine myomas with preoperative preparation with GnRH analogues, remains the treatment of choice [1-3,5,8-14]. It can be performed either with the standard (laparotomy, mini laparotomy) or the minimally invasive (laparoscopy, robotic-assisted surgery, hysteroscopy) approach [1-3,5,8-17]. In contrast, the nonsurgical management (embolization, focused ultrasound surgery) of uterine myomas, shows promising results regarding safety (EMMY trial), quality of life (REST trial) and long-term outcome (FIBROID Registry) in carefully selected patients [1-3,5,8-14,18-23].

To begin with, uterine artery embolization (UAE) is a nonsurgical procedure that uses transcatheter unilateral common femoral artery approach with the Seldinger technique. Both uterine arteries are selectively catheterized with a catheter or micro-catheter [11,22-24]. The tip of the catheter or micro-catheter is placed beyond the origin of the cervicovaginal branch, in order to exclude it from embolization [22,24,25]. Subsequently and under angiographic control, an embolic agent (trisacryl gelatin microspheres, spherical polyvinyl alcohol) is injected and the UAE is completed [7,11,22-27]. The main role of UAE, is the essential reduction in uterine blood flow at the arteriolar level [22,23,26]. In this way, UAE causes irreversible ischemia and leads to necrosis and shrinkage of uterine myomas [11,22,23,26,28].

The main target group for UAE, are patients who want to preserve their uterus and avoid any surgical procedure. Likewise, patients who reject blood transfusion for health concerns or religious reasons, are candidates for UAE [2,3,5,7,18,22-24,27,29,30]. Additionally, patients with relevant co-morbidities (obesity, coronary artery disease) and increased risk for perioperative complications, are also eligible for UAE [2,3,5,22,23,26]. The total number and the topography of uterine myomas play a crucial role, in patient selection process [2,3,5,22,26]. The main absolute contraindications for UAE, are: pregnancy, active pelvic inflammatory disease, genital cancer, previous pelvic radiation and impaired immune status [2,3,5,7,18,22,24,26,27,29,31]. Similarly, the main relative contraindications for UAE, are: severe vascular disease, severe allergy in radiographic contrast media,

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**Georgios Androutsopoulos\*, Georgios Adonakis and Georgios Decavalas**

*Department of Obstetrics and Gynecology, University of Patras, Greece*

**\*Corresponding author:** Georgios Androutsopoulos, Department of Obstetrics and Gynecology, University of Patras, Medical School, Rion 26504, Greece, Tel: +306974088092; Email: androutsopoulosgeorgios@hotmail.com; androutsopoulos@upatras.gr

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coagulopathy, impaired renal function and desire for future fertility [2,3,5,7,18,22,24,26,27,29,31,32].

According to EMMY trial, the main advantages of the UAE compared with the standard surgical management, are: the shorter operative time, the less intraoperative blood loss and the less postoperative pain. Moreover, EMMY and REST trials show an essential decrease in the total hospital stay and a faster recovery and return to daily activities in patients treated with UAE [2,3,5,19-23,29,30,33,34]. Based on the results from the FIBROID Registry, there is a substantial and durable improvement in general symptoms and the quality of life aspects, in patients treated with UAE [2,3,5,7,18,19,22-24,26]. According to the Society of Interventional Radiology (SIR), there is a great reduction in bulk symptoms (88-92%), an elimination of abnormal uterine bleeding (>90%) and a successful control of symptoms (75%), in patients treated with UAE [22,23,26,34]. Moreover, there is a significant reduction in myoma (50-60%) and uterine (40-50%) size, that becomes noticeable in several weeks and sustains for 3-12 months after UAE [22,23,26,30,34,35]. Additionally, the overall satisfaction rate among patients treated with UAE is comparable with the satisfaction rate among patients treated with the standard surgical management [2,3,5,19,22,23,26,29,30,33,36].

Overall, the intraprocedural complication rate has no significant differences between patients treated with UAE and total hysterectomy (8.6-25% vs. 2.7-20%) [20,22,23,33,34]. According to the EMMY trial, the intraprocedural major complication rate between patients treated with UAE and total hysterectomy is almost equal (1.2% and 1.3% respectively) [20,22,23]. Moreover, the most common intraprocedural complications in patients treated with UAE, are: pulmonary

embolism, arterial spasm, postpuncture hematoma, nerve injury at the puncture site, allergy in the radiographic contrast media, nephrotoxicity and uterine artery dissection during catheterization [2,3,5,20,22,23,26,27,30,34].

It is worth noting, that most treatment failures in patients treated with UAE, occur the first 2 years of follow up [22,23,29,33,35,36]. Probably, an incomplete uterine artery infarction results in regrowth of uterine myomas, despite the initial reduction in size [22,23,30,37]. In this light, the secondary intervention rates at 2 and 5 years of follow up among patients treated with UAE, is 23.5% and 28.4% respectively [19,22,23,33,35].

The clinical implications of UAE on ovarian reserve, are not well-established [2,3,5,22,23,38]. However, there are no significant differences on follicle stimulating hormone (FSH) levels between patients treated with UAE and total hysterectomy [38]. Moreover, a future pregnancy is feasible in patients treated with UAE [39,40]. Nevertheless, it is strongly recommended a close monitoring of the placental status, because of the increased risk for obstetric complications (miscarriage, abnormal placentation, preterm labor, malpresentation and postpartum hemorrhage) [2,3,5,22,23,30,39-41].

On the other hand, magnetic resonance imaging-guided focused ultrasound surgery (MRgFUS) is another nonsurgical procedure that combines the magnetic resonance imaging (MRI) with the therapeutic potential of focused ultrasound (FUS) [2,3,5,42,43]. More specifically, the MRgFUS uses high intensity ultrasound waves to penetrate soft tissues and produce well defined regions of protein denaturation and irreversible cell damage [2,3,5,7,42,44]. In this way, MRgFUS causes coagulative necrosis and leads to shrinkage of uterine myomas [2,3,5,7,22,42,44].

The main target group for MRgFUS, are patients who want to preserve their uterus and avoid any surgical procedure [2,3,5,7]. Moreover, patients with relevant co-morbidities (obesity, coronary artery disease) and increased risk for perioperative complications, are also candidates for MRgFUS [2,3,5]. Similarly, patients who reject blood transfusion for health concerns or religious reasons, are eligible for MRgFUS [2,3,5,7]. The main advantages of the MRgFUS compared with the standard surgical management, are: the shorter operative time, the less intraoperative blood loss and the less postoperative pain [2,3,5,8,42,45,46]. Furthermore, there is a significant decrease in the total hospital stay and a faster recovery and return to daily activities. Besides that, there is a substantial improvement in general symptoms and the quality of life aspects, in patients treated with MRgFUS [2,3,5,42,45,46].

The clinical implications of MRgFUS in patients with uterine myomas, are not well-established. However, in pregnancy after MRgFUS treatment, it is strongly recommended a very careful ultrasound evaluation of the placental site and status in order to ensure appropriate medical care and reduce the risk for obstetric complications [2,3,5,47].

## Conclusion

In conclusion, UAE and MRgFUS have shown promising results regarding safety, quality of life and long-term outcome in carefully selected patients with uterine myomas, minimizing the

need for any surgical management [2,3,5,22,23]. However, the nonsurgical management does not represent the treatment of choice for infertile women and for women wanting to preserve their childbearing capability [2,3,5,9,22,23].

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