

Uterine Artery Embolization: an Innovative Treatment Approach of Uterine Myomas

Androutsopoulos G^{1*}, Michail G² and Decavalas G³

¹Assist. Professor of Obstetrics & Gynecology, University of Patras, Medical School, Rion, Greece

²Lecturer of Obstetrics & Gynecology, University of Patras, Medical School, Rion, Greece

³Head of the Department of Obstetrics & Gynecology, University of Patras, Medical School, Rion, Greece

***Corresponding author:** Georgios Androutsopoulos, Assistant Professor, Department of Obstetrics and Gynecology, University of Patras, Medical School, Rion 26504, Greece, Tel: 306974088092; E-mail: androutsopoulos@upatras.gr ; androutsopoulosgeorgios@hotmail.com

Editorial

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Nowadays, uterine artery embolization (UAE) is a widely acceptable non-surgical procedure appropriate for selected patients with uterine myomas [1-6]. It is based on a well-established technique for treating severe pelvic bleeding [2]. It was initially described in 1976, in patients with gynecological malignancies and uncontrolled uterine bleeding [7]. Several years later in 1995, it was introduced in patients with uterine myomas as an alternative to the standard surgical intervention (myomectomy, hysterectomy) [1,3,5,6,8-11].

In principle, UAE is a minimal invasive procedure that uses transcatheter unilateral common femoral artery approach with the Seldinger technique [5,8,9]. Both uterine arteries are selectively catheterized with a catheter or micro-catheter [5,8,9]. It is very important to place the tip of the catheter or micro-catheter beyond the origin of the cervicovaginal branch, in order to exclude it from embolization [8,9,12]. Subsequently and under angiographic control, an embolic agent (trisacryl gelatin microspheres, spherical polyvinyl alcohol) is injected and the UAE is completed [2,5,8,9,12-14]. The main role of the procedure, is the significant reduction in uterine blood flow at the arteriolar level [2]. That causes irreversible ischemia and leads to necrosis and shrinkage of uterine myomas [2,5,8,15].

The main target group for UAE are patients who wish to preserve their uterus and avoid any surgical

intervention [1,3-6,9,13,14,16,17]. Furthermore, patients with related co-morbidities (obesity, coronary artery disease) and increased risk for perioperative complications, are also eligible for UAE [1-3,5,6]. Similarly, patients who refuse blood transfusion for health concerns or religious reasons, are candidates for UAE [1,3-6,9,13,14,16 17].

It is worth noting, that the size and location of uterine myomas play a major role in the patient selection process [1-3,5,6]. Moreover, pregnancy, active pelvic inflammatory disease or other pelvic infection, genital cancer, history of pelvic radiation and impaired immune status, are the main absolute contraindications for UAE [1-6,9,13,14,16,18]. Likewise, severe vascular disease limiting access and catheter manipulations, severe allergy in radiographic contrast media, coagulopathy, impaired renal function and desire for future fertility, represent relative contraindications for UAE [1-6,9,13,14,16,18,19]. The main advantages of the UAE, is the shorter operative time, the less intraoperative blood loss and the less postoperative pain, compared with the standard surgical intervention [1,3,5,6,16,17,20-24]. Likewise, there is a significant decrease in the hospital stay and a faster recovery with return to normal activities [1,3,5,6,16,17,20-24]. Additionally, there is a substantial improvement regarding the general symptoms and in the quality of life aspects [1-6,9,13,23]. Apart from that, the overall satisfaction rate among patients treated with UAE

is about 80% to 90% and it is comparable with the satisfaction rate among patients treated with the standard surgical intervention [1-3,5,6,16,17,20,23,25].

Compared with the standard surgical intervention, UAE results in slightly more postoperative symptoms (bleeding, pain, pressure complaints) during the first 6 weeks [1,3,5,6,20-23]. Moreover, there is a higher readmission rate mostly for pain and fever during the same time period [1,3,5,6,20-23]. Few patients are being affected by the post-embolization syndrome which is characterized by pelvic pain, low-range fever, nausea, vomiting, loss of appetite and malaise [2,17]. It primarily occurs during the first few days after UAE and it can commonly result in prolonged hospitalization (beyond 48 hours), readmissions and unexpected increase in the required level of care [2,14].

The effect of UAE on ovarian reserve is not well-established [26]. However, there are no significant differences on follicle stimulating hormone (FSH) levels between patients treated with UAE and patients who underwent to hysterectomy [26]. Furthermore, a future pregnancy is feasible in patients treated with UAE [27,28]. However, there is an increased risk for obstetric complications (miscarriage, abnormal placentation, preterm labor, malpresentation and postpartum hemorrhage) and close monitoring of the placental status is strongly recommended [1,3,5,6,17,27-29]. The secondary intervention rates at 2 and 5 years of follow up among patients treated with UAE, range around 23.5% and 28.4% respectively [20,23,30]. Nevertheless, most treatment failures (77.2%) occur the first 2 years of follow up [16,20,25,30]. Probably, an incomplete uterine artery infarction results in regrowth of uterine myomas despite the initial reduction [17,31].

It is also interesting to note, that the intra procedural complication rate in patients treated with UAE is approximately 8.6% to 25% [20,21,24]. Arterial spasm, post puncture hematoma, nerve injury at the puncture site, allergy in the radiographic contrast media, nephrotoxicity and uterine artery dissection during catheterization, are the most common intra procedural *minor* complications in UAE [1-3,5,6,14,17,21,24]. Furthermore, pulmonary embolism represents the most common intra procedural major complication in UAE [21]. Overall, the early post procedural complication rate (up to 6 weeks) in patients treated with UAE is about 72% [24]. Vaginal discharge, pain/fever (requiring readmission), fibroid expulsion (not requiring intervention), post puncture hematoma, urinary tract infection, urinary retention, renoureteral colic, urinary incontinence,

endometritis, hot flashes and thigh paresthesia, are the most common early post procedural *minor* complications after UAE [1-3,5,6,14,17,21,24]. Besides, pneumonia, sepsis, deep venous thrombosis and fibroid expulsion (requiring reintervention), are the most usual early post procedural *major* complications after UAE [1-3,5,6,14,17,21,24,32].

In contrast, the late post procedural complication rate (up to 6 months) in patients treated with UAE is just under 17% [2,14,17,21,32]. Permanent amenorrhea and prolonged vaginal discharge are the most often late post procedural *minor* complications after UAE [1-3,5,6,14,17,21,32].

In conclusion, UAE has shown promising results, simplifying or eliminating the need for the standard surgical intervention in carefully selected subgroups of patients with uterine myomas [1,3,5,6]. Nevertheless, UAE does not represent the treatment of choice for women suffering from infertility and for women wanting to preserve future childbearing capability [1,3,5,6,33].

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