

Uterine Artery Embolization for Symptomatic Leiomyomata

Jay Goldberg, MD, MSCP

Uterine artery embolization (UAE) remains largely underutilized in the treatment of fibroids, despite its appeal as a low-risk, nonsurgical procedure. However, a better understanding of benefits, limitations, and patient selection is beginning to change this picture.

Uterine fibroids are the most common tumors of the female reproductive tract, occurring in 20% to 70% of women between age 30 and 50 years.¹ Black women are most frequently affected, while white, Asian, and Scandinavian women have lower incidences.¹ Tumor size varies widely, and many women have multiple fibroids. Patients may be asymptomatic, with diagnosis on palpation of a firm, enlarged uterus during routine examination or on an incidental finding at imaging. Others may present with symptoms such as menorrhagia, oligomenorrhea, pelvic pain/pressure, dyspareunia, urinary frequency, abdominal distension, infertility,

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CONTINUING MEDICAL EDUCATION

GOAL

To discuss uterine artery embolization (UAE) as an alternative to hysterectomy and myomectomy for the treatment of uterine fibroids in women.

OBJECTIVES

1. To look at the advantages of UAE in terms of uterine preservation, efficacy, noninvasiveness, and patient convenience in women.
2. To consider appropriate patient candidacy and contraindications in women.
3. To assess data on complications and outcomes in women.

ACCREDITATION

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This activity has been peer reviewed and approved by Brian Cohen, MD, professor of clinical OB/GYN, Albert Einstein College of Medicine. Review date: April 2006. It is designed for OB/GYNs, primary care physicians, and nurse practitioners.

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and pregnancy complications. Given the nature and severity of these symptoms, fibroids can have a significant impact on quality of life.

Most symptomatic women eventually seek medical treatment. Medications used to treat fibroids include analgesics (usually nonsteroidal anti-inflammatory drugs [NSAIDs]) and combination estrogen/progestin oral contraceptives. Gonadotropin-releasing hormone agonists (eg, leuprolide) can reduce fibroid

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volume by up to 40%, while also decreasing vaginal bleeding.² However, their significant side-effect profile (eg, vasomotor instability, mood swings, bone loss) and the fibroids' quick return to baseline on discontinuation of therapy restrict use to temporary tumor reduction prior to surgery.

Women with symptomatic uterine fibroids refractory to medical management have traditionally undergone surgical resection via hysterectomy or myomectomy. In the United States, approximately 250,000 women undergo hysterectomy annually for symptomatic fibroids, with approximately 35,000 undergoing myomectomy.³ While preserving the uterus, up to 25% of women undergoing myomectomy may require additional procedures due to persistent symptoms or the growth of new fibroids.⁴ The desire for uterine/fertility preservation and avoidance of surgery has increased the demand for alternative treatments. Uterine artery embolization has emerged over the last decade as a popular and effective nonsurgical option.

Uterine artery embolization has been performed by interventional radiologists for over two decades to treat pelvic hemorrhage following delivery/abortion, ectopic pregnancy, gestational trophoblastic disease, and pelvic malignancy.^{5,6} Embolization of the uterine arteries was first reported as an effective primary treatment for symptomatic fibroids in 1995.⁷

INDICATIONS AND CONTRAINDICATIONS

As for hysterectomy and myomectomy, indications for UAE are symptomatic uterine fibroids refractory to medical management. Symptoms typically include menorrhagia, anemia, urinary frequency, dyspareunia, infertility, and abdominal/pelvic pain. In addition, UAE may be an especially useful option for women who are poor surgical candidates, perimenopausal, have extensive adhesive disease, refuse blood products, or who prefer to avoid surgery.

Contraindications to UAE include pelvic infection, severe allergy to contrast materials, arteriovenous shunting, an undiagnosed pelvic mass, coagulopathy, renal insufficiency, history of pelvic radiation, and genital tract malignancy. Desire for future fertility is a relative contraindication to UAE, as increased pregnancy complications have been reported postprocedure (eg, premature delivery).⁸⁻¹⁰ However, other studies have found good outcomes for most pregnancies conceived post-UAE.¹¹ There are no studies assessing the effects of UAE on fertility, and the American College of Obstetricians and Gynecologists considers it to be contraindicated in women wishing to retain fertility.¹²

In addition, patients desiring definitive treatment and guaranteed results are probably better served by hysterectomy. Likewise, women with intracavitary or submucosal fibroids may opt for hysteroscopic myomectomy depending on tumor size, as they are at higher risk for delayed post-UAE transcervical passage with labor-like pains and potential infection. Women with subserosal, pedunculated fibroids are at risk for UAE-induced necrosis of the stalk, potentially leading to intra-abdominal necrosis of the dislodged fibroid or to formation of a complex with the bowel.¹³ Also, with very large fibroids (uterus > 24 weeks' gestational size), myomectomy or hysterectomy may provide better relief of bulk symptoms and abdominal protrusion than the average 40% reduction in volume achieved by UAE.

PREOPERATIVE EVALUATION

Before referral to an interventional radiologist, the preoperative work-up should comprise a thorough history and physical/gynecologic examination, as well as a discussion of UAE and alternatives. A pregnancy test should be performed early in the assessment. Pelvic images should be obtained via ultrasonography or magnetic resonance imaging (MRI). While most gynecologists prefer ultrasonography, interventional radiologists may prefer MRI, as it may better differentiate fibroids from adenomyosis, which does not respond as well to UAE. The patient should also undergo endometrial biopsy to exclude hyperplasia or cancer, although this may be optional in women without abnormal bleeding.

TECHNIQUE

The procedure is performed by an interventional radiologist using either local or regional anesthesia. Arteriography is used to visualize the pelvic vasculature. Fluoroscopic guidance enables passage of a catheter into the right external iliac artery, through the right femoral artery, the aorta, the left common iliac artery, the left internal iliac artery, and the anterior division, then finally to the left uterine artery. Most commonly, acrylic copolymer beads (500 to 700 μm) are infused until slow flow or stasis occurs in the uterine artery and the fibroid vasculature is occluded (Figure). The catheter is then retracted and manipulated down the right uterine artery, which is similarly embolized. Procedure time ranges from 15 to 120 minutes, depending on the patient's anatomy and radiologist's skill.^{3,8,14,15}

Uterine artery embolization may be an outpatient procedure, but overnight hospitalization is sometimes required for adequate pain relief. Patients typically return to work within 7 to 10 days. By comparison, women are generally hospitalized for 2 to 3 days and require a 4- to 6-week convalescence following abdominal myomectomy or hysterectomy.

Typically, patients will experience mild to moderate cramping that is relieved with NSAIDs or narcotics. Patients often report a postembolization syndrome, with low-

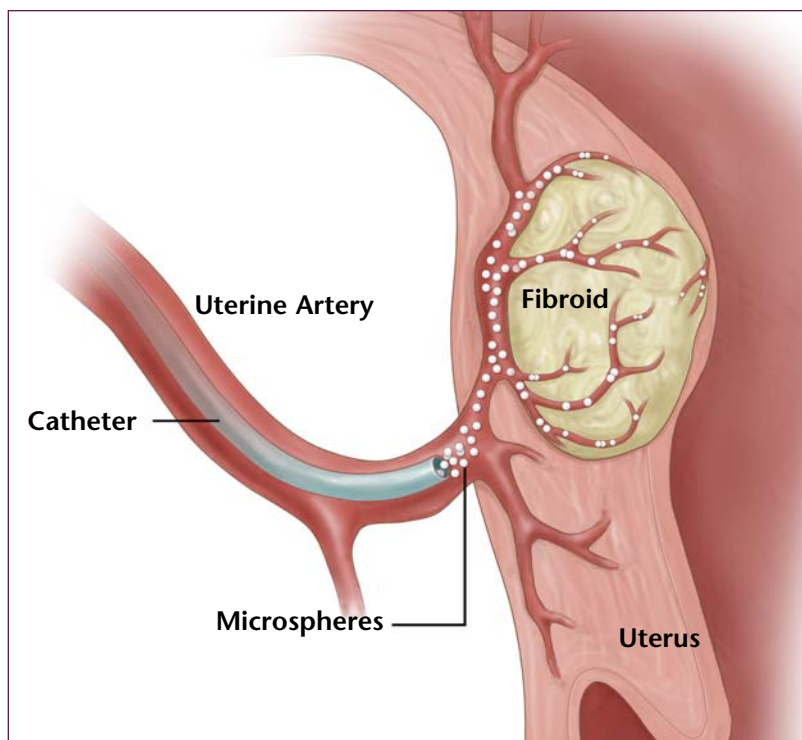


FIGURE. Acrylic copolymer beads (500-700 μm) are infused until slow flow or stasis occurs in the uterine artery and the fibroid vasculature is occluded.

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grade fever, pain, malaise, nausea, and leukocytosis; this typically presents within 4 days' postprocedure.⁶ This may be caused by the systemic effects of transient ischemia to the fibroids and uterus. While usually self-limiting and treatable with antipyretics and analgesics on an outpatient basis, these patients may be hospitalized for observation and antibiotic therapy.

COMPLICATIONS

Major complications have been reported in approximately 0.5% of patients, including pulmonary embolism, arterial thrombosis, groin hematoma, local infection, guide-wire perforation of major arteries, allergic reaction to intravascular contrast medium, endometritis, ischemia of pelvic organs, sepsis, and death.¹⁶ There have also been reports of total uterine necrosis, transient/permanent ovarian

TABLE. Major Advantages and Disadvantages of Uterine Fibroid Treatments

Treatment	Advantages	Disadvantages
Hysterectomy	Definitive therapy	4-6 wk recovery Loss of fertility Higher complication rate
Myomectomy	Future fertility Uterine preservation	4-6 wk recovery Higher complication rate
Uterine artery embolization	7-10 d recovery Lower complication rate Uterine preservation	Increases future pregnancy risks Higher treatment failure rate No outcomes data > 5 y

failure, genital-associated sexual dysfunction, and delayed diagnosis of uterine leiomyosarcoma.^{3,6,15,17-22} Nontarget vascular embolizations of the gluteus muscle, ovaries, labia minora, and bladder wall have also been reported.^{23,24} The complication rate is lower than that associated with myomectomy and hysterectomy, however.⁸

OUTCOMES

Worldwide experience, including more than 50,000 cases, has shown UAE to be a safe, effective treatment for symptomatic uterine fibroids (Table). A study of 200 consecutive cases noted improvement in heavy menorrhagia in 90% (95% confidence interval [CI], 86%, 95%) and bulk symptoms in 91% (95% CI, 86%, 95%) at 1 year. Subsequent gynecologic intervention was performed during the following 12 months in 11% (95% CI, 7%, 15%).¹⁴ Another study observed post-UAE reductions in the median uterine and dominant fibroid volumes of 35% and 42%, respectively; 91% of the 583 patients expressed satisfaction, including significant improvement in menorrhagia (83%), dysmenorrhea (77%), and urinary complaints (86%).¹¹ A comparison of women undergoing UAE (N = 102) and hysterectomy (N = 50) for symptomatic fibroids reported significant improvement in symptoms and quality of life in both groups, with overall morbidity occurring more frequently in the hysterec-

tomy group (34% versus 14.7%; $P = .01$). Three patients had serious complications in the hysterectomy group (pneumonia, vaginal-cuff herniation, recurrent bleeding requiring reoperation) versus two in the UAE group (amenorrhea, subsequent hysterectomy required).²⁵

OTHER CONSIDERATIONS

Compared to the number of women undergoing hysterectomy and myomectomy for uterine fibroids, the number of UAE procedures has remained relatively low—despite the medical and economic advantages of a nonsurgical approach. This has led to accusations of financial self-interest on the part of gynecologic surgeons,²⁶ but is more likely due to physicians' lack of experience and knowledge regarding the benefits of UAE. Currently, UAE is primarily marketed to the public by interventional radiologists, and most women are self-referred or physician-referred only after inquiring about the procedure.⁸

CONCLUSION

As an increasingly popular alternative to hysterectomy and myomectomy, UAE is safe and effective in most patients with symptomatic uterine fibroids. More than 90% of women undergoing UAE have significant reduction in bleeding and bulk symptoms, as well as an improvement in quality of life. In addition to uterine preservation, UAE offers the benefits

Coding for Uterine Artery Embolization for Symptomatic Leiomyomata

Frank Vidal, MMC

This pertinent, powerful study covers a wide range of procedural and diagnostic elements. However, in essence it focuses on the embolization process itself and, as such, coding should reflect this focus. The following are the International Classification of Diseases codes for classifying uterine leiomyomata and other benign uterine neoplasms, and the Current Procedural Terminology codes that apply to uterine artery embolization.

CLASSIFICATION

- **218**—Uterine leiomyoma
 - Bleeding uterine fibroid
 - Uterine fibromyoma
 - Uterine myoma
- **218.0**—Submucous uterine leiomyoma
- **218.1**—Intramural uterine leiomyoma
 - Interstitial leiomyoma of uterus
- **218.2**—Subserous uterine leiomyoma
 - Subperitoneal uterine leiomyoma
- **218.9**—Uterine leiomyoma, unspecified

- **219**—Other benign neoplasm of uterus
- **219.0**—Cervix uteri
- **219.1**—Corpus uteri
 - Endometrium
 - Fundus
 - Myometrium
- **219.8**—Other specified parts of uterus
- **219.9**—Uterus, part unspecified

PROCEDURE

- **37204**—Transcatheter occlusion or embolization (eg, for tumor destruction, to achieve hemostasis, to occlude a vascular malformation), percutaneous occlusion or embolization, any method; not involving the central nervous system, head, or neck
- **75894**—Transcatheter therapy or embolization, any method; radiologic supervision and interpretation

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of nonsurgical management, shorter hospitalization, quicker return to work, and financial savings for the health care system.

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