Treatment of Intrauterine and Large Pedunculated Subserosal Leiomyomata with Sequential Uterine Artery Embolization and Myomectomy

Ben E. Paxton, BA, Judy M. Lee, MD, MPH, and Hyun S. Kim, MD

Successful clinical outcomes were obtained after a combined therapy of uterine artery embolization (UAE) and subsequent myomectomy for gigantic subserosal leiomyoma exceeding 1,000 cm^3 in volume on a short stalk and multiple intrauterine leiomyomata in young patients who desired fertility and uterine preservation. UAE effectively treated symptomatic multiple intramural and submucosal leiomyomata for menorrhagia symptoms, which also facilitated uncomplicated subsequent myomectomy with devascularized gigantic leiomyoma for the treatment of bulk symptoms.

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Abbreviation: UAE = uterine artery embolization

UTERINE artery embolization (UAE) for symptomatic uterine leiomyomata has shown excellent short-term clinical efficacy and minimal complications (1). However, large pedunculated subserosal leiomyomas have been generally recognized as a relative contraindication for UAE because of the potential risk and complications from torsion at the stalk, ischemic necrosis, and separation from the uterus (2,3); therefore, these tumors are subject to surgical treatments, often consisting of hysterectomy. Although the safety of UAE for subserosal leiomyomata with stalk diameters of 2 cm or larger was recently suggested in a retrospective study (3) of 12 patients with leiomyomas with a mean maximum diameter of 8.3 cm and a mean volume of 279 cm^3 before UAE, safety and efficacy of UAE for large subserosal leiomyomas with diameters larger than 10 cm and/or volumes greater than 1,000 cm^3 on a short stalk are not well established.

Patients with large subserosal leiomyomas and multiple intrauterine leiomyomas who desire preservation of the uterus present a unique challenge for clinicians. We describe two cases of successful clinical outcome after combined therapy of UAE and myomectomy for gigantic pedunculated subserosal leiomyoma exceeding 1,000 cm^3 in volume on a short stalk and multiple intrauterine leiomyomata.

CASE REPORTS

According to our institutional guidelines, institutional review board approval was not required for this report. A 42-year-old black woman, gravida 2 para 1, presented with main symptoms of significant menorrhagia, cramping, and clotting. The patient also reported mass-effect symptoms including frequent urination, nocturia, dyspareunia, bloating, fullness, and weight gain. A clinical examination found the uterus size to be about 24 weeks. The baseline transformed symptom severity score was 81.25. Magnetic resonance (MR) imaging demonstrated a markedly enlarged pedunculated leiomyoma with a maximum dimension of 17 cm in a subserosal location and multiple intramural and submucosal leiomyomata (**Fig 1**). The volume of the pedunculated subserosal leiomyoma was estimated at 1,334 cm^3 according to the formula of a prolate ellipse: length × width × depth × 0.5233. There were several intramural and submucosal leiomyomas ranging in size from 4 cm to 6 cm. The patient desired treatment that would ensure uterine preservation.

UAE and myomectomy were planned. The patient underwent bilateral UAE with 22 mL of 500- to 700-μm tris-acryl gelatin microspheres (Embosphere; BioSphere Medical, Rockland, MA) and a 3-F microcatheter (**Fig 2**). The endpoints of embolization were

From The Russell H. Morgan Department of Radiology and Radiological Science (B.P., H.S.K.) and Department of Obstetrics and Gynecology (J.M.L.), Johns Hopkins University School of Medicine, 600 North Wolfe Street, Blalock 545, Baltimore, Maryland 21287-4010. Received March 8, 2006; revision requested June 26; final revision received September 7; and accepted October 2. **Address correspondence to** H.S.K.; E-mail: sikhkim@jhmi.edu

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Figure 1. Sagittal T2-weighted MR image before UAE and myomectomy demonstrates a markedly enlarged subserosal leiomyoma (open arrows) attached to the uterus by a short stalk (closed arrow). Note additional multiple intrauterine leiomyomas.

occlusion of the perileiomyoma plexus of known leiomyomata, stasis of flow in the distal part of the uterine artery, and reduced flow in the proximal part of the main uterine artery. Ten days after the UAE procedure, a transabdominal myomectomy was performed on the gigantic pedunculated leiomyoma, which weighed 2,700 g on pathologic examination (**Fig 3**). During the procedure, the patient lost 500 mL of blood and received one unit of packed red blood cells. Shortly after the treatments, the patient had complete resolution of all her symptoms, as demonstrated by the transformed symptom severity score of zero at 6-month follow-up. The patient has remained asymptomatic for 3 years and has not required additional treatment for leiomyoma.

A 41-year-old black woman, gravida 1 para 0, with symptoms of significant menorrhagia, was also treated with the same method for a gigantic 20-cm pedunculated subserosal leiomyoma with a short stalk with an estimated volume of 1,392 cm^3 and multiple intramural and submucosal leiomyomata. Fifteen weeks after uncomplicated recovery after UAE, a myomectomy was performed on the pedunculated subserosal leiomyoma. During the procedure, the patient lost 300 mL of blood, but no blood transfusion was required. The patient had complete resolution of all of symptoms after the treatments and has remained asymptomatic for 3 years. No additional treatment for leiomyoma was required.

DISCUSSION

The current report describes two cases of complementary UAE and myomectomy with successful clinical outcome for the treatment of gigantic subserosal leiomyomata and multiple intrauterine leiomyomata. Effective treatment of intramural and submucosal leiomyomata with UAE avoids surgical treatment of intrauterine leiomyomata. Transfusion, fever, ileus, infection, urinary retention, bladder injury, and peritoneal adhesions with adverse effects on fertility have been reported as possible periprocedural or postprocedural complications of myomectomy (4–7). Increased complications with greater numbers of leiomyomata removed have also been reported (8). Limiting operations on the leiomyoma outside of the uterus with less extensive resection and less reconstructive surgery on the uterus may decrease the risks from such complications. Successful UAE may also avoid the need for gonadotropin-releasing hormone agonists such as leuprolide acetate (Lupron; TPA Pharmaceuticals, Lake Forest, IL) before myomectomy.

Leiomyoma recurrence rates as high as 62% on ultrasound imaging at 5 years have been reported after myomectomy (9,10). In comparison with transabdominal myomectomies, greater recurrence rates after laparoscopic myomectomy have been reported (11,12). Repeat surgery rates for symptomatic recurrent leiomyoma as high as 35% at a mean of 84 months of follow-up have also been reported (13). Such recurrence is caused at least in part by incomplete resection of leiomyomata during the initial myomectomies. Complete resection of leiomyomas is technically more difficult for intramural or submucosal leiomyo-