Premyomectomy Uterine Fibroid Embolization for Massive Uterine Enlargement

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FIGURE 1.

Computed tomography scan demonstrating massively enlarged uterus with fibroids.

Courtesy of Jay Goldberg, MD, MSCP.

FIGURE 2.

Selective right ovarian arteriogram demonstrating blood supply to the uterine fibroids.

Courtesy of Jay Goldberg, MD, MSCP.

CASE HISTORY

A 35-year-old woman (gravida 3, para 0030) presented with complaints of abdominal discomfort and distension, dysmenorrhea, and menorrhagia. Physical examination revealed a pelvic mass comparable to 38 weeks' gestation, thought to consist of uterine fibroids. The tumors displaced the anatomic position of the cervix, making it impossible to obtain an endometrial biopsy sample. Computed tomography confirmed the mass to be a massively enlarged uterus with multiple fibroids (Figure 1).

The patient strongly desired future fertility and uterine preservation, so that hysterectomy was not an option. Uterine fibroid embolization (UFE) was discussed as a primary treatment, but was not thought to be the best solution. Even with a 40% to 50% reduction in fibroid volume, the patient's bulk symptoms would not be effectively treated. Additionally, the uterine cavity would most likely remain distorted, potentially causing subfertility.

Abdominal myomectomy was recommended as the best treatment option for both relieving the patient's symptoms and maximizing future fertility. Uterine

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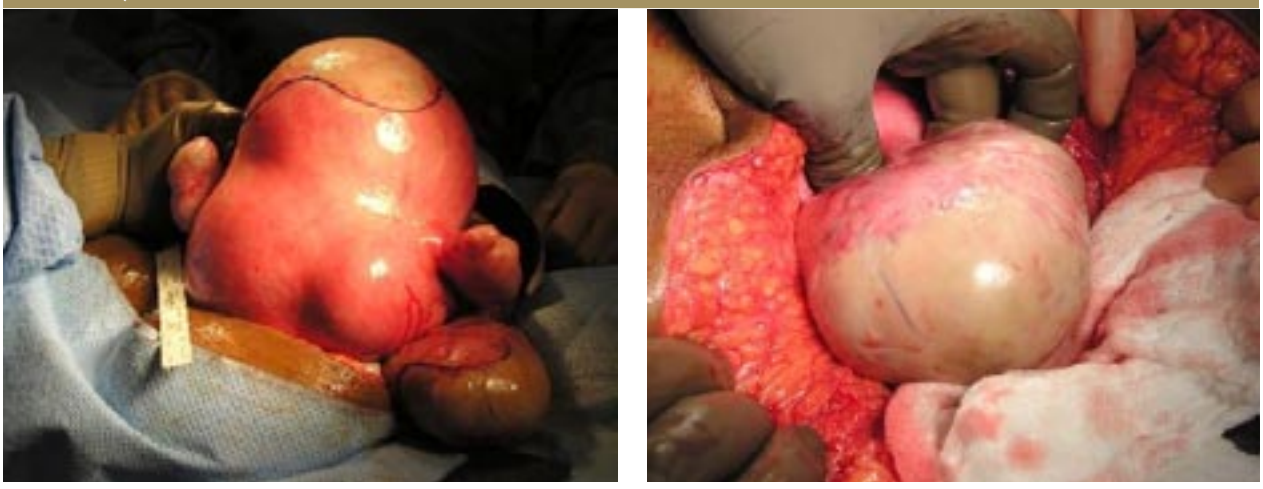
FIGURE 3, 4.



Demarcated, devascularized areas following premyomectomy uterine fibroid embolization.

Courtesy of Jay Goldberg, MD, MSCP.

curettage was recommended at the time of myomectomy to rule out endometrial pathology. The patient refused preoperative treatment with a gonadotropin-releasing hormone agonist due to the potential antiestrogenic side effects. Premyomectomy UFE was then considered and accepted by the patient as a means of decreasing the operative risk of hemorrhage by reducing uterine volume and vascularity.

Uterine fibroid embolization was performed via a 4-Fr sheath in the right femoral artery. Coaxial catherization with a 3-Fr catheter permitted selective delivery of 500- to 700-mcm acrylic microspheres into the right uterine artery and 500- to 700-mcm, 700- to 900-mcm, and 900- to 1,200-mcm microspheres into the left uterine artery under fluoroscopic guidance until stasis of flow was achieved. No reflux of embolic material was noted from either uterine artery. Abdominal aortography revealed an enlarged right ovarian artery originating from an accessory right renal artery, which was selectively catheterized and injected with contrast material for diagnostic arteriography (Figure 2).

One month later, the patient underwent abdominal myomectomy via a midline skin incision. Post-UFE, the initially 38-week-sized uterus had decreased to a 34-week-sized, irregularly shaped uterus with numerous degenerating fibroids (Figures 3, 4). Eleven fibroids were removed. Endometrial curettage was performed when the endometrial canal was entered abdominally. The total blood loss was only 200 mL during the uncomplicated, 2-hour procedure. The patient was discharged on the second postoperative day, and experienced no complications. As transmural incisions were made during the myomectomy, cesarean delivery was recommended to the patient for future pregnancies. The pathology report stated that the specimen consisted of 2,219-g, infracted, smooth-muscle tumors with foreign material in the blood vessels, consistent with prior UFE.

DISCUSSION

Uterine fibroid embolization is an increasingly popular, safe, and effective primary treatment for uterine fibroids. One prospective, multicenter study observed post-UFE reductions in median uterine volume and dominant fibroid volume of 35% and 42%, respectively, with 91% of patients expressing satisfaction with the procedure.[1] Overall, the complication rate for UFE is also lower than that for hysterectomy or myomectomy, with a shorter convalescence.[2]

With UFE alone as a primary treatment, patients with massively enlarged uteri (> 20 weeks' gestation in size) may not achieve satisfactory relief of bulk symptoms based on the probable rate of shrinkage.[1] Additionally, the subgroup of women with massively enlarged uteri who also desire future fertility are better served with myomectomy to correct uterine cavity distortion

TABLE. Premyomectomy Uterine Fibroid Embolization: Indications and Contraindications

Indications	Contraindications	Relative Contraindications
Uterine enlargement due to fibroids (> 20 weeks)	Pregnancy	Desire for future fertility
Cervical fibroid	Pelvic infection	
Severe anemia	Severe allergy to contrast material	
Refusal of blood products	Arteriovenous shunting	
Significant pelvic adhesions	History of pelvic irradiation	

and maximally decrease uterine volume.

In patients desiring future fertility, UFE is relatively contraindicated due to the increased risks to future pregnancies of preterm delivery, spontaneous abortion, malpresentation, and postpartum hemorrhage compared with the general population and with patients undergoing prior myomectomy.[3-5] However, most pregnancies conceived following UFE do well overall—although no prospective studies have been published to establish post-UFE fertility rates. The Table summarizes the indications and contraindications for premyomectomy UFE.

Before Ravina et al[6] first reported UFE as an effective primary treatment for symptomatic fibroids in 1995, it was used as pretreatment prior to myomectomy or hysterectomy for very large uterine fibroids in an effort to decrease surgical risks (especially hemorrhage). It was noted that many of these patients were subsequently able to avoid their scheduled myomectomy/hysterectomy due to symptomatic relief following UFE. Since this report, more than 75,000 women have undergone UFE as a primary therapy for symptomatic fibroids. However, the best interval for performing myomectomy following adjuvant UFE remains to be established.

The authors have noted a trend toward more women (especially black patients) requesting uterine-preserving treatment for fibroids—even with massively enlarged uteri, and even when future fertility may not be a consideration. It is unknown whether this trend is influenced by body image/femininity issues, cultural factors, and/or the experience of sexuality and orgasm.

Premyomectomy UFE does confer substantial additional costs—eg, a 48% increase from $5,676 for myomectomy alone to $8,383 in Philadelphia, Pa.[7] However, these expenses must be weighed against the potential savings via complication reduction in this high-risk subgroup.

CONCLUSION

Presurgical UFE is a particularly useful option for patients with fibroids causing massive uterine enlargement, a strong desire for uterine preservation, and a high risk of hemorrhage during myomectomy potentially leading to hysterectomy and other complications. While the popularity of UFE as a primary fibroid treatment has significantly increased, its original indication as a premyomectomy or prehysterectomy therapeutic adjuvant remains an effective but underutilized option. Thus, the potential benefits of premyomectomy UFE may outweigh the risks in women with massive uterine enlargement due to fibroids, even in patients desiring future fertility.

REFERENCES

1. Pron G, Bennett J, Common A, et al. The Ontario Uterine Fibroid Embolization Trial. Part 2. Uterine fibroid reduction and symptom relief after uterine artery embolization for fibroids. *Fertil Steril*. 2003;79(1):120-127.
2. Spies JB, Cooper JM, Worthington-Kirsch R, Lipman JC, Mills BB, Benenati JF. Outcome of uterine embolization and hysterectomy for leiomyomas: results of a multicenter study. *Am J Obstet Gynecol*. 2004;191(1):22-31.
3. Goldberg J, Pereira L, Berghella V. Pregnancy after uterine artery embolization. *Obstet Gynecol*. 2002;100(5 pt 1):869-872.
4. Goldberg J, Pereira L, Diamond J, et al. Pregnancy outcomes after treatment for fibromyomata: uterine artery embolization versus laparoscopic myomectomy. *Am J Obstet Gynecol*. 2004;191(1):18-21.
5. Committee on Gynecologic Practice, American College of Obstetricians and Gynecologists. ACOG Committee Opinion. Uterine artery embolization. *Obstet Gynecol*. 2004;103(2):403-404.
6. Ravina JH, Herbreteau D, Ciraru-Vigneron N, et al. Arterial embolisation to treat uterine myomata. *Lancet*. 1995;346(8976):671-672.
7. Goldberg J, Bussard A, McNeil J, Diamond J. Cost and reimbursement for three fibroid treatments: hysterectomy, myomectomy, and uterine fibroid embolization [abstract]. Proceedings of: Advances in Uterine Leiomyoma Research: National Institutes of Health 2nd International Congress; February 2005; Bethesda, Md:. Available at: http://orwh.od.nih.gov/health/40A-Goldberg.pdf. Accessed April 22, 2006.