Master Class

Submucous Uterine Fibroids

BY CHARLES E. MILLER, M.D.

Uterine fibroids are the most common benign tumor of the female genital tract. Almost 40% of the 600,000 hysterectomies performed each year in the United States are performed for symptomatic fibroids. Given the fact that many fibroids occur in women who want to maintain fertility, have serious health concerns, or desire the most minimally invasive option, hysterectomy often cannot be considered. When the fibroid is submucous in location, a hysteroscopic approach to myomectomy is the procedure of choice. Despite this, few gynecologists maintain this technique in their surgical armamentarium.

It is my desire that this article will spur many readers to safely proceed with hysteroscopic myomectomy. In order to accomplish this, I have asked Dr. Linda Bradley, director of hysteroscopic services at the Cleveland Clinic, and Dr. Keith Isaacson, medical director of the center for minimally invasive gynecologic surgery at Newton-Wellesley Hospital in Newton, Mass., to join me in a discussion on the advantages of the hysteroscopic approach to myomectomy.

Both Dr. Bradley and Dr. Isaacson are noted internationally for their expertise in hysteroscopic surgery. Not only are they gifted hysteroscopic surgeons, but they have written, lectured, and been principal researchers in this area as well.

On that note, let us proceed. ■

Dr. Miller, *a reproductive endocrinologist in private practice in Arlington Heights, Ill., and Naperville, Ill., is the medical editor of this column.*

Hysteroscopic Myomectomy Safe and Easy

Contrary to what many still believe, hysteroscopic myomectomy can be one of the safest, mostly easily learned surgical procedures in gynecology. It is certainly underutilized and continues to be offered and performed by relatively few gynecologists.

With proper training and attention to the preoperative evaluation, surgical technique, and strict fluid management, we can offer patients a treatment for submucous fibroids that is superior in most cases both to other surgical options—such as hysterectomy, open myomectomy, and uterine artery embolization—and to nonsurgical treatments.

The resection of submucosal myomas transcervically is a less invasive approach than are other surgical procedures. We can achieve excellent outcomes in terms of both fertility and the resolution of abnormal uterine bleeding and other symptoms. And we can do so with rates of complications, recurrence, and repeat resection that are much lower than commonly expected.

BY LINDA BRADLEY, M.D.

BY KEITH ISAACSON, M.D.

The Preoperative Evaluation

A comprehensive preoperative evaluation is critical. We want the best possible assessment of the size and location of the fibroid or fibroids, as well as the depth and even the vascularity of each fibroid.

We want to know how deeply each fibroid penetrates into the myometrium and whether it is resectable with the hysteroscope. With such an assessment, we can make a sound decision about whether the fibroid can be treated hysteroscopically and whether we, individually, have the expertise to do it. In general, the risk of fluid absorption, bleeding, and uterine perforation increases as the percentage of fibroid extending into the myometrium increases.

Diagnostic hysteroscopy, sonohysterography, transvaginal ultrasonography, and—in some cases—MRI may be used for this evaluation.

Just Before Surgery

The creation of false passages at the time of cervical dilation, cervical tears, and uterine perforation all are common to hysteroscopy performed with a stenotic, or unripe, cervix. It is therefore important that we consider administering a cervical-ripening agent as a prelude to surgery.

Some institutions and physicians will administer a cervical-ripening agent to women deemed to be at high risk of having cervical stenosis, such as patients who are nulliparous or who have had a cone biopsy. In other institutions, every patient undergoes a preoperative cervical-softening procedure.

One protocol worth serious consideration is the routine oral administration of 200 mcg of misoprostol (Cytotec) 8-12 hours before surgery for all patients, with high-risk patients receiving an additional dose 2 days before surgery. The protocol will result in a cervix that is softer, significantly less likely to tear, and certainly more easily dilated. This can be achieved with few and infrequent side effects, sometimes including some cramping, fever, or vaginal bleeding. Some, but not all, pharmacies will dispense the drug in single or double tablets; it is worth knowing where to refer patients.

Hysteroscopes and Fluid Management

Gynecologic surgeons today have a choice of three different types of instruments for resecting myomas hysteroscopically, and their relative popularity probably varies by region. The longest-standing option is a monopolar hysteroscope, which uses monopolar radiofrequency current in a wire loop. The bipolar scope, which employs bipolar energy in a wire loop, was introduced about 10 years ago.

The Smith & Nephew rotating resectoscope is the newest addition, having been available for almost a year. It differs from classic resectoscopes in two ways: The system converts electrical energy into mechanical energy to remove the fibroid, and it immediately evacuates the fibroid segments.

The uterine-distention medium used will vary by modality. Operative hysteroscopy that is performed in a monopolar environment, for instance, requires a hypotonic electrolyte-free solution, such as 1.5% glycine, 3% sorbitol, and 5% mannitol. Bipolar operative hysteroscopy can be performed using an isotonic, electrolyte-containing solution like saline or Ringer's lactate solution. The rotating resectoscope requires normal saline.

In any case, regardless of the chosen modality, fluid management is critical for intraoperative safety. It demands meticulous attention and vigilance. The exact inflow and outflow of any fluid must be monitored to prevent the complications that can result from excess fluid absorption and subsequent hyponatremia (with an electrolyte-free solution) or fluid overload.

A good fluid management system, which is essential to all operative hysteroscopy, will rapidly and continuously measure fluid input and output, and will provide a real-time assessment of the fluid deficit. Each hospital should have a protocol for fluid management that specifies, among other things, a fluid deficit at which surgery using each modality should be stopped.

We should be operating, in other words, with a set maximum allowable limit of fluid absorption. If we discontinue surgery when the fluid volume reaches this predetermined level, we can avoid major fluid-related complications.

As a general rule of thumb, monopolar systems using nonelectrolyte solutions must be stopped earlier to avoid hyponatremia.

There are variations in practice, particularly among gynecologists with significant hysteroscopy experience, but experts typically recommend a threshold of no more than 1,000 cc for monopolar systems, and a threshold of no more than 2,000 cc when electrolyte solutions are used with a bipolar system.

Particularly with larger fibroids, which require more time and more fluid, consider injecting dilute vasopressin into the cervical stroma at the start of the surgery. Several studies have shown that vasopressin reduces intravasation of the fluid, makes the cervix easier to dilate, and decreases intraoperative bleeding.

Surgical Technique

Some surgeons prefer to insert the hysteroscope into the cervix blindly, whereas many prefer to advance it under direct visualization. Some prefer mono- or bipolar scopes with a 12-degree angle, whereas others like to work with 25- or 30-degree hysteroscopes. The Smith & Nephew system uses a 0-degree scope.

There are, however, some givens. With any system, a fibroid should never be removed at its base because a free-floating fibroid is difficult to retrieve. Each fibroid should be shaved down in strips, the number of which depends largely on the size of the loop (if the monopolar or bipolar hysteroscope is being used) and the percentage of fibroid that is in the cavity.

When using the monopolar and bipolar hysteroscopes, place the loop in contact with the fibroid and then apply a minimal amount of tension going back toward the cervix before activating the electrode. Do not activate the electrode until you have the loop coming back toward the cervix.

This process must be deliberate and precise, because once the loop is activated, there is little tactile sensation. Then shave the fibroid down in strips until the myometrium is reached. With the morcellator, the rotary blade must run in contact with the fibroid.

At that point, intentionally let the endocavity deflate and the myometrium decompress. Quite often, you will find that the intramural portion of the fibroid now protrudes into the cavity, having been pushed outward as a result of the myometrial decompression and the decrease in endocavity pressure. It can then be shaved down more.

If you can see the pseudocapsule between the muscle and fibroid, you can also then use your wire loop to "massage out" any remaining portion of the fibroid. Often, if the maximum fluid absorption has not been reached, you will be able to massage it out, shave it down, massage it out more, and so forth, to the extent that you can actually resect the deep intramural portion of the myoma. If you cannot see the pseudocapsule, it is time to stop the surgery.

Some surgeons may opt at this point to proceed laparoscopically to retrieve the remaining intramural portion of the fibroid,

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particularly if they estimate that more than 10%-15% of the fibroid remains, and if they are operating on patients with infertility concerns or patients who are planning to undergo in-vitro fertilization. Or they may chose to come back later for a repeat procedure.

Other surgeons prefer a less aggressive approach—in which the patient's symptoms are monitored, and she returns to the office in 2-3 weeks for a flexible diagnostic hysteroscopy—particularly when dealing with patients whose symptoms do not include infertility. More often than not, any remaining portion of the fibroid will appear white and avascular and will not cause any further trouble for the patient.

The bottom line, regardless, is that hysteroscopic surgery is successful if the presenting problem is safely eradicated. Your level of aggressiveness will be determined largely by your patient's symptoms and individual situation. With a careful preoperative evaluation of the fibroids and the use of sound judgment early on about the appropriateness of the procedure and your own skills, repeat procedures will and should be unusual.

The Nuances of Intrauterine Pressure

Remember that as uterine distention pressure rises higher than the mean arterial or venous pressure, fluid absorption also rises. There is an advantage, therefore, to maintaining the lowest intrauterine pressure possible; also, more of the fibroid will protrude into the cavity. On the other hand, the greater visibility gained with greater distention makes it advantageous to work under higher pressures.

Some surgeons work at 100 mm of pressure consistently and believe they can work quickly because they can see well; others start surgery at 50-60 mm of pressure and gradually increase the pressure to achieve greater distention and visibility as needed.

Each surgeon develops his or her own technique, with the underlying goal being to maintain a balance between a pressure that gives adequate flow, distention, and visualization, and a pressure that minimizes fluid absorption. With an understanding of the underlying principles and the importance of fluid management, you will find an approach that keeps you from getting frustrated and leads to good outcomes.

Use of the Morcellation System

The new fibroid morcellation system offers some advantages—particularly when the surgeon is new to hysteroscopic procedures—because it continuously suctions away fibroid strips and eliminates the need to remove debris and redistend the cavity.

Its disadvantage, however, is that it does not allow the same breadth of surgery as can be performed with a wire loop. Generally, the new system is to be used to resect fibroids that are completely or mainly in the uterine cavity. Type II myomas, as well as large fibroids, are very difficult to deal with using this technique.

Starting Out

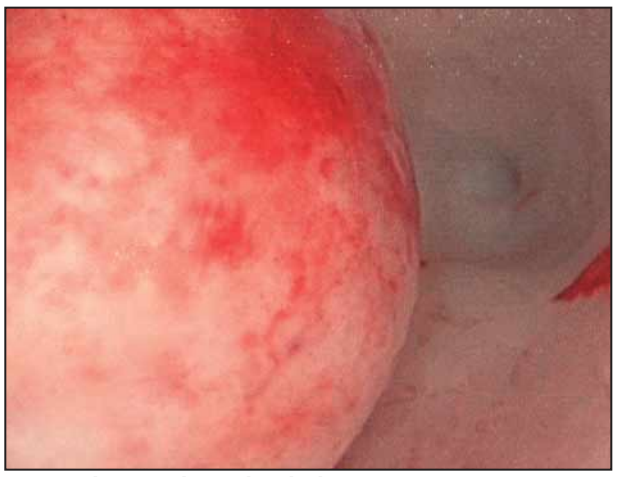
With any of the available devices and systems, hysteroscopic myomectomy is not nearly as technically challenging as other procedures gynecologists do. In our experience, it is not difficult to teach residents. To start, beginners should work with other physicians and remove smaller fibroids until they gain confidence. They could even start with polyps, which are easier to remove.

Those new to this procedure will soon appreciate the fact that the fears of complications are unfounded. The overall complication rate is less than 3%—no higher, and probably lower, than the rate for other procedures like endometrial ablation—and rates of infections, hematomas, and other injuries are significantly lower than those for other procedures.

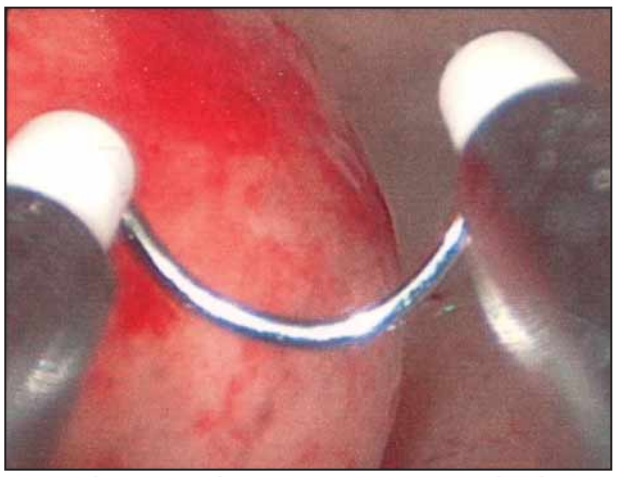
Uterine artery embolization has been gaining popularity for treatment of symptomatic uterine fibroids, and it is a procedure that patients will probably want to discuss. In many institutions, however, the procedure is not even an option for submucous fibroids, because the fibroids can separate, subsequently blocking the cervix, going through necrosis, and eventually causing sepsis and other complications. In fact, at least two deaths have been reported.

In general, patients' symptoms tend to continue after uterine artery embolization, and patients often ultimately require hysteroscopic resection.

Hysteroscopy, on the other hand, has it all for most patients: low invasiveness, high efficacy, extremely low recurrence, and excellent patient safety. ■

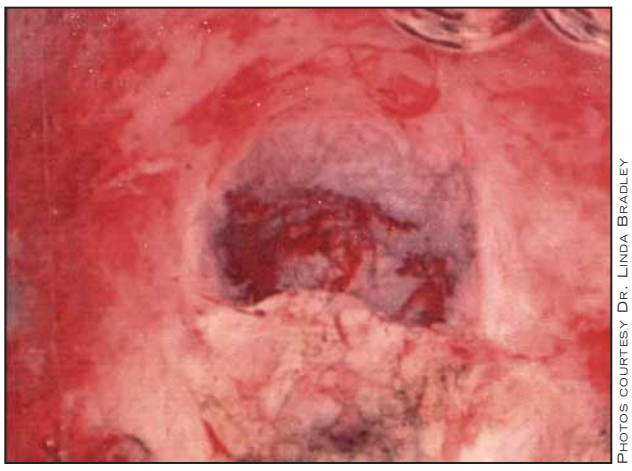


A 2-cm intracavitary fibroid is shown before surgery.



Versapoint 4-mm wire loop approaches the fibroid.

The 4-mm wire loop is placed behind the fibroid.



The postoperative resection bed is shown here.

PHOTOS COURTESY DR. LINDA BRADLEY

If Fertility Is a Consideration, Choose Myomectomy Over UFE

BY GIANCARLO LA GIORGIA
Contributing Writer

TORONTO — Fibroid patients who want to preserve or improve their chances of having children should undergo uterine fibroid embolization only if they are not good candidates for myomectomy, Dr. Gary P. Siskin told his colleagues at the annual meeting of the Society of Interventional Radiology.

He cautioned that, although the minimally invasive procedure has several advantages over myomectomy in treating fibroids (leiomyomas), uterine fibroid embolization (UFE) carries a higher risk of pregnancy complications than its surgical alternative.

"Based on [available] data, myomectomy is a procedure that can potentially help patients with fibroids have a child. In my opinion, this remains the preferred first option for these women," said Dr. Siskin, chief of vascular and interventional radiology at the Albany (N.Y.) Medical Center.

The anatomic and physiologic effects of fibroids on the uterine cavity include distortion of the endometrial cavity and reduction of uterine contractility, both of which interfere with placental implantation, thereby increasing the risk of spontaneous abortion and preterm labor. Nevertheless, Dr. Siskin said the direct impact of fibroids on fertility remains a controversial subject.

Fibroids are present in about 5%-10% of patients who are considered to be infertile and have been identified as the sole cause of infertility in 2% of these patients. In addition, the incidence of fibroids increases as a woman approaches menopause—when her fertility is in sharpest decline. However, many women with fibroids do achieve conception, though there may be complications.

Dr. Siskin pointed to the significant amount of postmyomectomy data suggesting a connection between fibroids and fertility. In particular, one comprehensive review of 23 studies in 1998 found an overall postmyomectomy conception rate of 57%—a figure that rose to 61% in women with no other known infertility risk factor.

"Patients can successfully conceive and deliver healthy babies after UFE," Dr. Siskin said, but he stressed the limited postprocedure fertility data available for UFE compared with myomectomy. "This alone makes myomectomy the preferred option for fibroid patients at the present time," he said.

Citing the Ontario Multicenter Trial (Obstet. Gynecol. 2005; 105:67-76), Dr. Siskin pointed out several concerns about pregnancy following a UFE, including possible increased risk of spontaneous abortion, abnormal placentation, uterine rupture, or preterm delivery.

He also noted research suggesting an increased risk of transient amenorrhea, ovarian failure, and endometrial atrophy in UFE patients, primarily in women over 45 years.

Dr. Siskin stressed that all symptomatic fibroid patients should be presented with the option of embolization. However, he said that for patients whose main concern is to improve or preserve fertility, "I treat them like an infertility patient and send them for a myomectomy consultation and will only consider them as a [UFE] patient if they're not a candidate for myomectomy."

Dr. Siskin added that MRI in particular is underused in evaluating infertility patients for fibroids.

"With MR, you can easily see the number, position, and size of the growths, whether they're distorting the endometrial cavity, and whether the patient is a candidate for myomectomy [or UFE]." If the growths are too few or too small, they can rule out fibroids altogether, Dr. Siskin said. ■