Abdominal myomectomy:
Patient and surgical technique considerations

Myomectomy is appropriate for many women with uterine fibroids whether or not they wish to preserve their childbearing potential. An expert provides guidance on abdominal myomectomy, including intraoperative technique, controlling blood loss, and postoperative care.

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CASE
Woman with fibroids seeks alternative to hysterectomy
A 42-year-old woman (G2P2) presents to the office for evaluation of heavy menstrual bleeding and known uterine fibroids. Physical examination reveals a 16-week-sized uterus, and ultrasonography shows at least 6 fibroids, 2 of which impinge on the uterine cavity. She does not want to have any more children, but she wishes to avoid a hysterectomy.

Abdominal myomectomy: A good option for many women
Abdominal myomectomy is an underutilized procedure. With fibroids as the indication for surgery, 197,000 hysterectomies were performed in the United States in 2010, compared with approximately 40,000 myomectomies. Moreover, the rates of both laparoscopic and abdominal myomectomy have decreased following the controversial morcellation advisory issued by the US Food and Drug Administration.

The differences in the hysterectomy and myomectomy rates might be explained by the many myths ascribed to myomectomy. Such myths include the beliefs that myomectomy, when compared with hysterectomy, is associated with greater risk of visceral injury, more blood loss, poor uterine healing, and high risk of fibroid recurrence, and that myomectomy is unlikely to improve patient symptoms.

Studies show, however, that these beliefs are wrong. The risk of needing treatment for new fibroid growth following myomectomy is low. Hysterectomy, compared with myomectomy for similar size uteri, is actually associated with a greater risk of injury to the bowel, bladder, and ureters and with a greater risk of operative hemorrhage. Furthermore, hysterectomy (without oophorectomy) can be associated with early menopause in approximately 10% of women, while myomectomy does not alter ovarian hormones. (See “7 Myomectomy myths debunked,” which appeared in the February 2017 issue of OBG MANAGEMENT.) Another myth debunked: Fibroids do not “degenerate” into...
leiomyosarcomas, and the risk of leiomyosarcoma in premenopausal women with presumed uterine fibroids is extremely low.5,6

For women who have serious medical problems (severe anemia, ureteral obstruction) due to uterine fibroids, surgery usually is necessary. In addition, women may request surgery for fibroid-associated quality-of-life concerns, such as heavy menstrual bleeding, infertility, pelvic pressure, urinary frequency, or incontinence. In one prospective study, the authors found that when women were assessed 6 months after undergoing myomectomy, 75% reported experiencing a significant decrease in bothersome symptoms.7

Myomectomy may be considered even for women with large uterine fibroids who desire uterine conservation. In a systematic review of the perioperative morbidity associated with abdominal myomectomy compared with abdominal hysterectomy for fibroids, which included 1,520 women with uterine size up to 16 to 18 weeks, no difference was found in major morbidity rates.8 Investigators who studied 91 women with uterine size ranging from 16 to 36 weeks who underwent abdominal myomectomy reported 1 bowel injury, 1 bladder injury, and 1 reoperation for bowel obstruction; no women had conversion to hysterectomy.9

Since ObGyn residency training emphasizes hysterectomy techniques, many residents receive only limited exposure to myomectomy procedures. Increased exposure to and comfort with myomectomy surgical technique would encourage more gynecologists to offer this option to their patients who desire uterine conservation, including those who do not desire future childbearing.

**Imaging techniques are essential in the preoperative evaluation**

For women with fibroid-related symptoms who desire surgery with uterine preservation, determining the myomectomy approach (abdominal, laparoscopic/robotic, hysteroscopic) depends on accurate assessment of the size, number, and position of the fibroids. If abdominal myomectomy is planned because of uterine size, the presence of numerous fibroids, or patient choice, transvaginal/transabdominal ultrasonography usually is adequate for anticipating what will be found during surgery. Sonography is readily available and is the least costly imaging technique that can help differentiate fibroids from other pelvic pathology. Although small fibroids may not be seen on sonography, they can be palpated and removed at the time of open surgery.

If submucous fibroids need to be better defined, saline-infusion sonography can be performed. However, if laparoscopic/robotic myomectomy (which precludes accurate palpation during surgery) is being considered, magnetic resonance imaging (MRI) allows the best assessment of the size, number, and position of the fibroids.10 When adenomyosis is considered in the differential diagnosis, MRI is an accurate way to determine its presence and helps in planning the best surgical procedure and approach.

**Correct anemia before surgery**

Women with fibroids may have anemia requiring correction before surgery to reduce the need for intraoperative or postoperative blood transfusion. Mild iron deficiency anemia can be treated prior to surgery with oral elemental iron 150 to 200 mg per day. Vitamin C 1,000 mg per day helps to increase intestinal iron absorption. Three weeks of treatment with oral iron can increase hemoglobin concentration by 2 g/dL.11 For more severe anemia or rapid correction of anemia, intravenous (IV) iron sucrose infusions, 200 mg infused over 2 hours and given 3 times per week for 3 weeks, can increase hemoglobin by 3 g/dL.11 In our ObGyn practice, hematologists manage iron infusions.

**Abdominal incision technique**

Even a large uterus with multiple fibroids usually can be managed through use of a transverse lower abdominal incision. Prior to reaching the lateral borders of the rectus abdominis, curve the fascial incision.
We employ 4 approaches to reduce intraoperative blood loss: misoprostol, tranexamic acid, vasopressin, and a uterine and ovarian vessel tourniquet. Misoprostol 400 μg inserted vaginally 2 hours before surgery induces myometrial contraction and compression of the uterine vessels. This agent can reduce blood loss by 98 mL per case. Tranexamic acid, an antifibrinolytic, is given IV piggyback at the start of surgery at a dose of 10 mg/kg; it can reduce blood loss by 243 mL per case. Vasopressin 20 U in 100 mL normal saline, injected below the vascular pseudocapsule, causes vasoconstriction of capillaries and small arterioles and venules and can reduce blood loss by 246 mL per case. Intravascular injection should be avoided because rare cases of bradycardia and cardiovascular collapse have been reported. Using vasopressin to decrease blood loss during myomectomy is an off-label use of this drug. Place a tourniquet around the lower uterine segment, including the infundibular pelvic ligaments. Tourniquet use is the most effective way to decrease blood loss during myomectomy, since it can reduce blood loss by 1,870 mL. For women who wish to preserve fertility, take care to ensure that the tourniquet does not compromise the tubes. For women who are certain they do not want to preserve fertility, discuss the possibility of performing bilateral salpingectomy to decrease the risk of subsequent tubal (“ovarian”) cancer.

Some surgeons incise the broad ligaments bilaterally and pass the tourniquet through the broad ligaments to avoid compromising blood flow to the ovaries. Occluding the utero-ovarian ligaments with bulldog clamps to control collateral blood flow from the ovarian artery has been described, but the clamps can tear these often enlarged and fragile uterine veins during manipulation of the uterus. Release the tourniquet every 15 to 30 minutes to allow reperfusion of the ovaries. In women with ovarian torsion lasting hours to days, the ovary has been found to resist hypoxia and ovarian vessel tourniquet to manage intraoperative blood loss. Although no data exist to show that using these methods together is advantageous, they have different mechanisms of action and no negative interactions.

4 approaches to managing intraoperative blood loss

In my practice, we employ misoprostol, tranexamic acid, vasopressin, and a uterine and ovarian vessel tourniquet to manage intraoperative blood loss. Although no data exist to show that using these methods together is advantageous, they have different mechanisms of action and no negative interactions.
Preserving the pseudocapsule reduces bleeding and may maintain tissue growth factors and neurotransmitters that are thought to promote wound healing.

Consider blood salvage. For women with multiple or very large fibroids, consider using a salvage-type autologous blood transfusion device, which has been shown to reduce the need for heterologous blood transfusion. This device suctions blood from the operative field, mixes it with heparinized saline, and stores the blood in a canister (FIGURE 2). If the patient requires blood reinfusion, the stored blood is washed with saline, filtered, centrifuged, and given back to the patient intravenously. Blood salvage, or cell salvage, avoids the risks of infection and transfusion reaction, and the oxygen transport capacity of salvaged red blood cells is equal to or better than that of stored allogeneic red cells.

Additional surgical considerations

Previous teaching suggested that proper placement of the uterine incisions was an important factor in limiting blood loss. Some authors suggested that vertical uterine incisions would avoid injury to the ascending uterine vessels should inadvertent extension of the incision occur. Other authors proposed horizontal uterine incisions to avoid severing the arcuate vessels that branch off from the ascending uterine arteries and run transversely across the uterus. However, since fibroids distort the normal vascular architecture, it is not possible to entirely avoid severing vessels in the myometrium (FIGURE 3). Uterine incisions can therefore be made as needed based on the position of the fibroids and the need to avoid inadvertent extension to the ascending uterine vessels or cornua.

Fibroid anatomy and vascularity. Fibroids are entirely encased within the dense blood supply of a pseudocapsule and no distinct “vascular pedicle” exists at the base of the fibroid. It is therefore important to extend the uterine incisions down through the entire pseudocapsule until the fibroid is clearly visible. This will identify a less vascular surgical plane, which is deeper than commonly recognized. Once the fibroid is reached, the pseudocapsule can be “wiped away” using a dry laparotomy sponge (see VIDEO 3). Staying under the pseudocapsule reduces bleeding and may preserve the tissue growth factors and neurotransmitters that are thought to promote wound healing.

Adhesion prevention. Limiting the number of uterine incisions has been suggested as a way to reduce the risk of postoperative pelvic adhesions. To extract fibroids that are distant from an incision, however, tunnels must be created within the myometrium, and this makes hemostasis within these defects difficult. In that blood increases the risk of adhesion formation, tunneling may be counterproductive. If tunneling incisions are avoided and hemostasis is secured immediately, the risk of adhesion formation should be lessened.

Therefore, make incisions directly over...
Evidence-based studies support the effectiveness of ERAS in gynecologic and general surgery procedures.

Postoperative care: Manage pain, restore function

The pain pump infuser, attached to one soaker catheter above and one below the fascia, provides continuous infusion of bupivacaine to the incision at 4 mL per hour for 4 days. The pain pump greatly reduces the need for postoperative opioids. Use of a patient-controlled analgesia pump, with its associated adverse effects (sedation, need for oxygen saturation monitoring, slowing of bowel function) can thus be avoided. The patient’s residual pain is controlled with oral oxycodone or hydrocodone and scheduled nonsteroidal anti-inflammatory drugs.

In my practice, we use an enhanced recovery after surgery (ERAS) protocol designed to reduce postoperative surgical stress and expedite a return to baseline physiologic body functions. Excellent well-researched, evidence-based studies support the effectiveness of ERAS in gynecologic and general surgery procedures.

Pre-emptive, preoperative analgesia (gabapentin and celecoxib) and end-of-case IV acetaminophen are given to reduce the inflammatory response and the need for postoperative opioids. Once it is confirmed that the patient is hemodynamically stable, add ketorolac 30 mg IV every 6 hours on postoperative day 1. Nausea and vomiting prophylaxis includes ondansetron and dexamethasone at the end of surgery, avoidance of bowel edema with restriction of intraoperative and postoperative fluids (euvolemia), early oral feeding, and gum chewing. On the evening of surgery, the urinary catheter is removed to reduce the risk of bladder infection and facilitate ambulation. Encourage sitting at the bedside and early ambulation starting the evening of surgery to reduce risk of thromboembolism and to avoid skeletal muscle weakness and postoperative fatigue.

Most women are able to be discharged on postoperative day 2. They return to the

FIGURE 3 Distortion of normal uterine vessels by fibroids

FIGURE 4 A pseudocapsule with a rich vascular network surrounds the fibroid

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office on postoperative day 5 for removal of the pain pump.

**CASE Continued: Fibroids removed via abdominal myomectomy**

We performed an abdominal myomectomy through a Pfannenstiel incision. Nine fibroids—3 of which were not seen on MRI—ranging in size from 1 to 7 cm were removed. Intravaginal misoprostol, IV tranexamic acid, subserosal vasopressin, and a uterine vessel tourniquet limited the intraoperative blood loss to 225 mL. After surgery, a pain pump and ERAS protocol allowed the patient to be discharged on postoperative day 2, and she returned to the office on day 5 for removal of the pain pump. Oral pain medication was continued on an as-needed basis.

**WATCH FOR** part 3 of this 3-part series, in which Dr. Parker provides pearls for laparoscopic myomectomy technique.

**Acknowledgment**

The author would like to thank Stanley West, MD, for generously teaching him the surgical techniques for performing abdominal myomectomy.

**References**

7. Dilek S, Ertunc D, Tok EC, Cimen R, Doruk A. The effect of rosal vasopressin, and a uterine vessel tour-niquet limited the intraoperative blood loss to 225 mL. After surgery, a pain pump and ERAS protocol allowed the patient to be discharged on postoperative day 2, and she returned to the office on day 5 for removal of the pain pump. Oral pain medication was continued on an as-needed basis.

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