



Myomectomy

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Up to date



- ▶ *Uterine leiomyomas (fibroids or myomas) are the most common type of pelvic tumor in women, an approximately 70 to 80 percent lifetime risk.*
- ▶ *There are many management options for fibroid-related symptoms, including expectant management, medical therapy, non-excisional procedures (endometrial ablation, uterine artery embolization, magnetic resonance guided focused ultrasound), and surgery (Myomectomy is the surgical removal of leiomyomas from the uterus, leaving the uterus in place).*
- ▶ *This can be accomplished using an abdominal, laparoscopic, hysteroscopic, or vaginal approach. (myomectomy, hysterectomy).*



Nezhat

- ▶ Of the 600,000 hysterectomies performed annually in the United States, one third are done for leiomyomas.
- ▶ This number rises dramatically for women over the age of 40 and for those in certain ethnic groups.
- ▶ For African American women, 61.3% of hysterectomies are done for leiomyomas, and for women in the 45-to-54-year age group, 53% of all hysterectomies, regardless of race, are done for this indication.
- ▶ It is estimated that more than 25% of women over the age of 36 have one or more leiomyomas, with 50% of these being symptomatic.

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- ▶ Uterine leiomyomas (myomas) are benign smooth muscle tumors arising from the myometrium.
 - ▶ Despite the fact that myomas are quite common, very little is known about their etiology.
 - ▶ They are monoclonal – arising from a single myometrial cell. Different karyotypes of multiple myomas have been found in the same patient.
 - ▶ What causes abnormal myometrial cells to transform into clinically detectable myomas is also unknown.
 - ▶ There are, however, more estrogen receptors in myomas than in the surrounding myometrium and less estradiol conversion, so hormonal factors certainly play a role.

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- ▶ There has also been speculation that chromosome rearrangement may contribute to tumor initiation and growth as well as stimulation by growth hormone and other insulin-like growth factors.
 - ▶ Myomas are heterogeneous; some women have solitary myomas, whereas others have multiple myomas.
 - ▶ Myomas may be subserous, intramural, pedunculated, or submucous.
 - ▶ Also, the old teaching that a hysterectomy is necessary in uterus larger than 12 gestational weeks because the adnexa cannot be adequately examined is no longer true in the age of modern imaging technology such as ultrasound, computed tomography (CT), and magnetic resonance imaging (MRI).

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- ▶ The criteria for intervention as outlined by the American College of Obstetrics and Gynecology in their published Quality Assurance criteriasets are:
 - ▶ Clinically apparent myomas that are a significant concern to the patient, even if otherwise asymptomatic.
 - ▶ Myomas causing excessive bleeding and/or anemia.
 - ▶ Myomas causing acute or chronic pain.
 - ▶ Myomas causing significant urinary problems not due to other abnormalities.

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- Various modalities besides the bimanual pelvic and rectal examination have been used to diagnose and classify myomas, the mainstay being transabdominal and transvaginal ultrasound.
 - MRI has been used for more accurate myoma “mapping” as well as differentiation of pedunculated myomas from adnexal masses.
 - To evaluate whether or not an intracavitary component is present, saline infusion sonography as well as hysteroscopy are valuable tools.
 - Hysterosalpingography is useful in the evaluation of infertile patients with myomas because tubal patency, as well as the size and shape of the uterine cavity, can be assessed.

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- ▶ The treatment of symptomatic leiomyomas for women who have completed child bearing has been, in the vast majority of cases, hysterectomy.
 - ▶ Perimenopausal women are often given no choice other than hysterectomy, with myomectomy offered in only a small number of cases.
 - ▶ Recent advances in the nonsurgical management of leiomyomas, including medical management with gonadotropin-releasing hormone (GnRH) analogues or antagonists, mifepristone, raloxifene, and progesterone receptor modifiers as well as uterine artery embolization, have been promising for these patients but may be inappropriate for those who want to preserve childbearing, because none has been shown to enhance fertility.

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- ▶ Certainly, for women in the reproductive age group wanting to maintain fertility, a myomectomy remains the “gold standard.”
 - ▶ Abdominal myomectomy, however, is associated with significant morbidity, including excessive blood loss, a high rate of blood transfusion, infection, and post operative adhesions.
 - ▶ Recurrence rates have been reported to be between 5% and 30%, with 20% to 25% of patients requiring a subsequent hysterectomy.



ABDOMINAL MYOMECTOMY

- ▶ The most common indications for abdominal myomectomy are:
- ▶ abnormal uterine bleeding or bulk-related symptoms (eg, pelvic/abdominal pain or pressure).
- ▶ Indications for which the benefit of myomectomy is unproven include: evaluation of pelvic malignancy (eg, ovarian or uterine cancer), infertility, and prevention of obstetric complications.
- ▶ For women undergoing abdominal or laparoscopic myomectomy, we suggest **not** pretreating with GnRH agonists.
- ▶ Use of these agents is a reasonable option in women for whom treatment would allow a transverse rather than a vertical incision and who place a high priority on type of surgical incision.

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- ▶ In our practice, we use prophylactic antibiotics for this procedure, since intra abdominal infection may adversely affect fertility.
 - ▶ For women with bulk-related symptoms of uterine leiomyomas, the decision regarding procedure depends upon patient characteristics and preferences.
 - ▶ The procedure of choice for women who desire future pregnancy is myomectomy.
 - ▶ For women who do not wish to preserve fertility and do not prefer definitive surgery, the choice must be individualized.
 - ▶ Uterine artery embolization and laparoscopic myomectomy are the least invasive options; eligibility for each of these procedures depends upon patient (and fibroid) characteristics.

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- ▶ For patients who are candidates for either of these procedures, we suggest laparoscopic myomectomy rather than uterine artery embolization .
 - ▶ Women who place a high priority on avoiding abdominal incisions may reasonably choose embolization.
 - ▶ For women who do not undergo an interventional radiology procedure and who have pelvic organ prolapse or have risk factors for prolapse (eg, increasing parity, obesity)We suggest myomectomy rather than hysterectomy.
 - ▶ For women who prefer definitive surgery,hysterectomy is required.

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- ▶ All other women should choose the least invasive surgical approach for which they are eligible and that is available to them (eg, abdominal myomectomy, laparoscopic hysterectomy, vaginal hysterectomy).
 - ▶ Blood loss during myomectomy can be prevented or decreased with mechanical or pharmacologic methods.
 - ▶ Allogeneic blood transfusion can be avoided by using methods of autologous blood transfusion.

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- ▶ Fever occurs within 48 hours after surgery in approximately 12 to 67 percent of women following myomectomy.
 - ▶ Many women with post-myomectomy fever have not localized findings.
 - ▶ Adhesion formation occurs in approximately 36 percent of women after myomectomy.
 - ▶ Myomectomy relieves symptoms in 80 percent of women.
 - ▶ The rate of subsequent surgery for fibroids following myomectomy is 21 to 34 percent



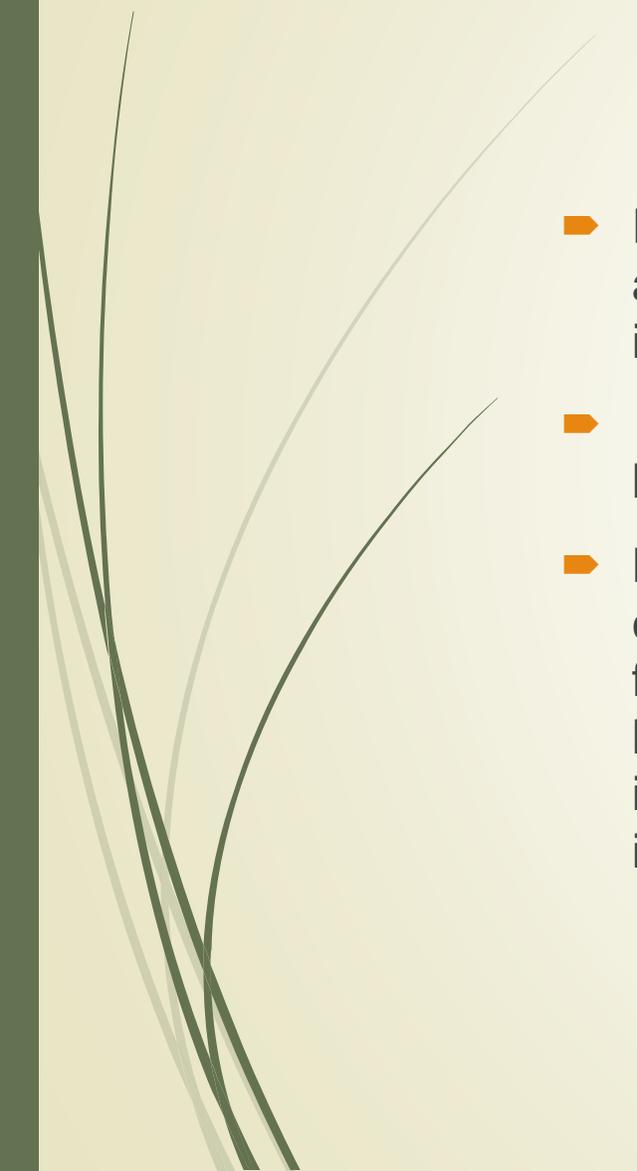
Laparoscopic myomectomy

- ▶ Appropriate candidates for laparoscopic myomectomy are women with the following characteristics:
- ▶ Symptomatic uterine leiomyoma(s).
- ▶ Leiomyomas are the appropriate size, number, and location for laparoscopic removal.
- ▶ Hysteroscopic myomectomy is not feasible.
- ▶ An abdominal approach is required to treat intra abdominal pathology other than leiomyomas.

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- ▶ **Indications** — The most common Indications for laparoscopic myomectomy are:
 - ▶ Abnormal uterine bleeding
 - ▶ Bulk-related symptoms – pelvic/abdominal pain or pressure; pressure on the urinary or gastrointestinal tract resulting in urinary (eg, urinary frequency, urinary incontinence, hydronephrosis) or bowel symptoms (eg, constipation).
 - ▶ Dysmenorrhea is an infrequent indication for myomectomy. Dysmenorrhea is more commonly associated with conditions (eg, endometriosis) other than with myomas.
 - ▶ Myomectomy or other fibroid-specific treatment for the indication of dysmenorrhea should be performed only when other therapies for dysmenorrhea have failed.

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- ▶ **Contraindications** — Laparoscopic myomectomy is contraindicated in women in whom laparoscopy or uterine conservation are contraindicated (eg, medical comorbidities, cervical or uterine cancer).
 - ▶ Laparoscopic myomectomy offers several advantages compared with abdominal myomectomy, including decreased morbidity and a shorter recovery.
 - ▶ However, the wide application of laparoscopic myomectomy is limited by the characteristics of myomas that can be reasonably removed and the surgical expertise required (eg, laparoscopic suturing).

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- ▶ **Candidates for laparoscopic myomectomy** — Determining whether a woman is a candidate for laparoscopic myomectomy depends upon the location, size, and number of leiomyomas, although parameters for these vary with surgical expertise.
 - ▶ Important factors regarding the location of fibroids include the depth of penetration into the myometrium and position relative to important structures (eg, uterine vessels, fallopian tubes).
 - ▶ Pedunculated subserosal fibroids are the easiest to remove, but myomas in other locations can also be excised laparoscopically.
 - ▶ In addition, many surgeons find anterior or fundal myomas easier to remove than those that are posterior.

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- ▶ Few data address the optimal criteria for a successful laparoscopic myomectomy, and the ability to successfully perform a laparoscopic myomectomy also depends in large part on surgical expertise.
 - ▶ The largest study was a prospective multicenter study of 2050 women undergoing laparoscopic myomectomy .
 - ▶ Leiomyoma characteristics that were significantly associated with major complications (eg, bleeding requiring blood transfusion, visceral injury, procedural failure) included: size of myoma >5 cm; >3 myomas removed; and intra ligamentous location; intramural myomas were significantly associated with an increase in minor, but not major, complications (eg, fever, uterine manipulator injuries).



Laparoscopic versus open myomectomy

- ▶ In appropriately selected patients, laparoscopic myomectomy has lower overall morbidity and a shorter recovery time than open myomectomy.
- ▶ A systematic review of six randomized trials including 576 women compared laparoscopic with abdominal myomectomy.
- ▶ Laparoscopic myomectomy had a statistically significant increase in operative duration (13 min longer), but a decrease in blood loss (34 ml less).
- ▶ However, these differences are small and unlikely to be clinically significant. The overall risk of complication was significantly lower for laparoscopic myomectomy (OR 0.47; 95% CI 0.26-0.85), but there was no statistically significant difference in the risk of major complications (eg, hemorrhage requiring transfusion, visceral injury, thromboembolism) (OR 0.49; 95% CI 0.09-2.70); however, the analysis lacked sufficient statistical power to detect this difference.

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- **The data available show that laparoscopic myomectomy was associated with less hemoglobin drop, reduced operative blood loss, more patients fully recuperated at day 15, diminished postoperative pain, and fewer overall complications but longer operation time.**
 - **However, major complications, pregnancy and recurrence were comparable in the two groups.**
 - **The data show that if performed by suitably specialized surgeons in selected patients, laparoscopic myomectomy is a better choice than open surgery.**

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- ▶ **laparoscopic myomectomy is a minimally invasive procedure with a shorter recovery and a lower overall risk of complications than abdominal myomectomy.**
 - ▶ **More data are needed about the comparative risks of major complications and fibroid persistence or recurrence.**
 - ▶ **Patient eligibility and access to trained surgeons limit the availability of this procedure.**
 - ▶ **Given the available data, we suggest laparoscopic rather than open myomectomy for women with leiomyomas when technically feasible (depending upon size, number, and location) and who have easy access to a surgeon with advanced laparoscopic skills.**

Meta-analysis

Shen et al

- ▶ A meta-analysis was conducted to assess the effects of laparoscopic versus minilaparotomic myomectomy on uterine leiomyoma in premenopausal women. They performed a computerized search of MEDLINE, Embase, and the Cochrane Library from 1996 to 2014.
- ▶ From 711 studies, a total of 4 studies met their inclusion criteria, and a meta-analytic technique was used to study the 4 randomized controlled trials involving 577 women with symptomatic uterine leiomyoma.
- ▶ Compared with the minilaparotomic myomectomy group, the laparoscopic myomectomy group showed a significantly less hemoglobin drop and blood loss, lower postoperative analgesic use, shorter duration of postoperative ileus, shorter hospitalization days and recovery time, and higher levels in the pregnancy rate per cycle and the live birth rate per cycle.

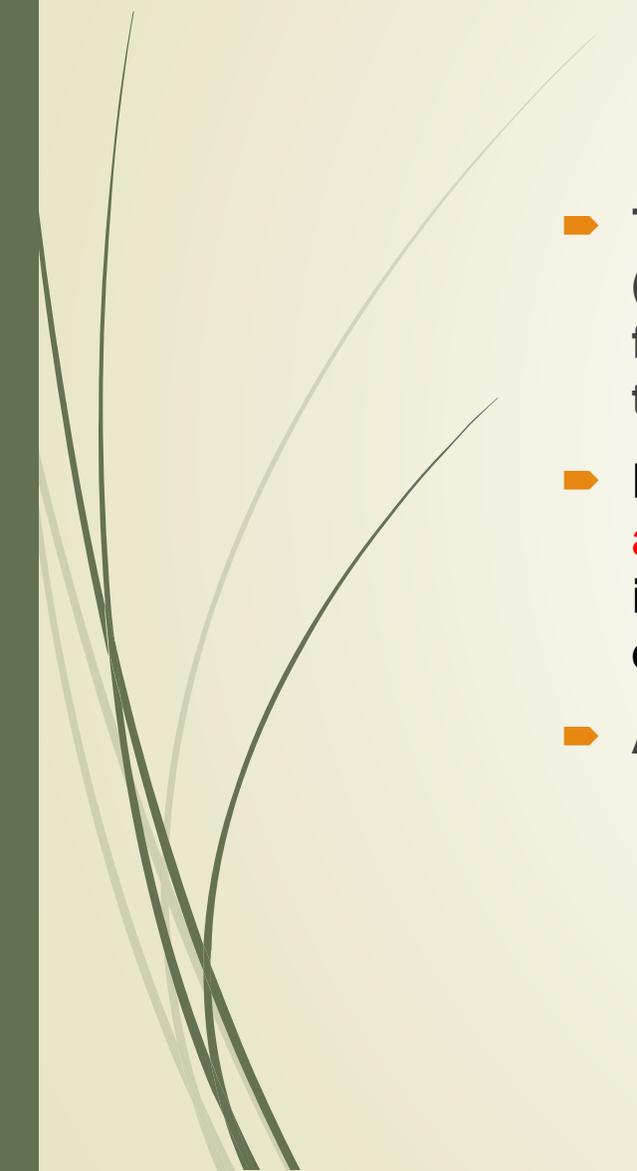
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- ▶ **There was no significant difference between the 2 groups regarding the operating time, complications, laparotomic conversion rate, cumulative pregnancy rate, cumulative live birth rate, and abortion rates.**
 - ▶ **When performed by experienced surgeons in selected patients (e.g., symptomatic leiomyoma women who have the indications for surgery), laparoscopic myomectomy is a better choice than minilaparotomic myomectomy.**



PREOPERATIVE EVALUATION AND PREPARATION

- ▶ **Informed consent — Women with symptomatic fibroids should be counseled about other medical, interventional radiology, and surgical options for treatment.**
- ▶ **Potential complications of the procedure, including conversion to laparotomy and the likelihood of recurrence of fibroid associated symptoms should also be reviewed.**
- ▶ **Imaging —Pelvic sonography is typically the initial imaging study.**
- ▶ **Magnetic resonance imaging (MRI) provides more accurate information regarding myoma size, number, and location than other imaging modalities.**
- ▶ **MRI is also the best modality to diagnose adenomyosis, which can mimic leiomyomas and/or make myomectomy more difficult. MRI is also indicated if uterine sarcoma is suspected.**

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- ▶ **GnRH agonists — Preoperative use of gonadotropin releasing hormone agonists reduces the size of myomas, and may theoretically allow a laparoscopic rather than abdominal approach in some women. No studies have evaluated this approach.**
 - ▶ **Disadvantages of these agents are that they may make removal of myomas more difficult and may increase the risk of persistent myomas.**
 - ▶ **In our practice, we do not pretreat with these agents prior to laparoscopic myomectomy.**

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- ▶ **Thromboprophylaxis** — Patients undergoing laparoscopic myomectomy (major surgery, defined as >30 minutes duration) are at low to moderate risk for venous thromboembolism and require appropriate thromboprophylaxis, whether mechanical or pharmacologic.
 - ▶ **Prophylactic antibiotics** — Antibiotic prophylaxis **is typically not administered for laparoscopic procedures**. The risk of surgical site infection is low in laparoscopic procedures in which the vagina or bowel are not entered.
 - ▶ **Anesthesia** — Laparoscopic myomectomy requires general anesthesia.

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- **PROCEDURE — The basic steps of laparoscopic myomectomy are:**
 - **Insert laparoscopic ports**
 - **Apply measures to reduce blood loss**
 - **Make uterine incision(s)**
 - **Remove myomas**
 - **Close uterine defects**

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- **Laparoscopic port placement — Port placement is based upon the position and size of the myomas to be removed, usually higher than the uterine fundus to allow access to the myomas.**
 - **A left upper quadrant approach may be used for initial access if uterine size is near or above the umbilicus. If there are unexpected findings (eg, extensive adhesive disease) that preclude laparoscopic myomectomy, the procedure should be converted to laparotomy.**
 - **Placement of two ports on either the patient's right side for right-handed surgeons or left side for left-handed surgeons makes laparoscopic suturing more ergonomic.**

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- ▶ **These include a 12 mm port at approximately 2 cm medial to the iliac crest to allow access for adequately sized curved needles and an ipsilateral 5 mm port medial and slightly cephalad to the larger port.**
 - ▶ **A contralateral 5 mm port is also placed.**

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- ▶ **Measures to reduce blood loss-** To control bleeding from large vessels within a myometrial defect, we desiccate briefly with bipolar electrosurgical paddles.
 - ▶ **Excessive desiccation devascularizes the myometrium and should be avoided, since it may increase the risk of uterine rupture in subsequent pregnancy.**

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- ▶ Uterine incision — A **transverse myometrial incision, rather than a vertical incision**, allows more ergonomic laparoscopic suturing of the uterine defect.
 - ▶ The incision is made directly over the myoma and carried deeply until definite myoma tissue and the avascular plane just deep to the capsule of the myoma are noted.

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- **Removal and morcellation of myomas — Techniques for removing myomas vary.**
 - **Closure of uterine defects — Delayed absorbable sutures are placed in one, two or three layers, depending upon the depth of the myometrial defect.**
 - **In our practice, we use size 0 polydioxanone (eg, PDS™).**
 - **Other sutures, including polyglactin (Vicryl) or barbed suture, may be used, although no studies have compared the use of different sutures with regard to strength of the uterine wound.**

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- ▶ **We close all defects, including the serosa following removal of a pedunculated fibroid.**
 - ▶ **It is controversial whether reapproximation of the myometrium via laparoscopic suturing gives the uterine wall the same strength as multilayer closure at laparotomy.**
 - ▶ **The security of the closure may impact the risk of uterine rupture in subsequent pregnancy.**



COMPLICATIONS

- ▶ **Hemorrhage** — In series of 500 or more laparoscopic myomectomies, the rate of hemorrhage or blood transfusion varied widely from 0.1 to 6 percent.
- ▶ **The average blood loss reported was 80 to 248 ml (range 20 to 1000 mL).**
- ▶ **Fever and infection** — Fever occurs in many women following myomectomy, but a localized source is often not identified.
- ▶ **Bowel or bladder injury** — Visceral injury during laparoscopic myomectomy is rare.
- ▶ **In series of 500 or more laparoscopic myomectomies, the rate of bowel injury was 0 to 0.04 and of bladder injury was 0 to 0.3 percent.**

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- ▶ **Conversion to laparotomy — Conversion to laparotomy occurs in 1 to 2 percent of laparoscopic myomectomy procedures.**
 - ▶ **Adhesive disease — Adhesion formation after myomectomy has been well documented. Studies in which second look laparoscopy has been performed following laparoscopic myomectomy have reported intra abdominal adhesions in 36 to 66 percent of women.**
 - ▶ **laparoscopic myomectomy may result in fewer adhesions than abdominal myomectomy. This was suggested by a prospective cohort study (n = 28) in which second look laparoscopy following laparoscopic compared with abdominal myomectomy revealed adhesions in fewer women (4 of 14 versus 9 of 14 women) and less dense adhesions [7]. Further study is needed to validate these findings**

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- ▶ **Persistent or new myomas —** In a multicenter retrospective cohort study of 512 women who underwent laparoscopic myomectomy, the rates of post-myomectomy myomas at five and eight years were 53 and 84 percent; however, the rates of reoperation were much lower, 7 and 16 percent.
 - ▶ **Risk factors for the presence of leiomyomas were similar to those for open myomectomy, including: multiple myomas at time of surgery, uterine size ≥ 13 weeks, and age < 36 years.**
 - ▶ **In this study, pregnancy after myomectomy was associated with an increased risk of subsequent myomas, but this was contrary to findings of other studies of laparoscopic and open myomectomy.**

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- ▶ **FOLLOW-UP — A woman is encouraged to resume her normal daily activities as quickly as is comfortable.**
 - ▶ **Decisions regarding resumption of vaginal intercourse are made by the patient; there are no medical restrictions on sexual activity.**
 - ▶ **Patients may return to work as soon as they have regained sufficient stamina and mobility.**
 - ▶ **We see patients for a follow-up visit at two weeks postoperatively.**

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- ▶ **Interval to conception — Women who undergo myomectomy with significant uterine disruption should wait several months before attempting to conceive; recommendations for the interval to conception range from **three to six months**.**
 - ▶ **Uterine rupture during pregnancy following myomectomy — Myomectomy is associated with an increased risk of uterine rupture during subsequent pregnancy.**
 - ▶ **Operative techniques, instruments and energy sources used during laparoscopic myomectomy often differ from those employed during laparotomy.**

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- ▶ **Failure to adequately suture myometrial defects, lack of hemostasis within uterine defects with subsequent hematoma formation, or the excessive use of electrocautery with devascularization of the myometrium have all been postulated to interfere with myometrial wound healing and increase the potential for rupture.**
 - ▶ **In the largest study of laparoscopic myomectomy, 2050 women followed for an average of 42 months, there were 386 pregnancies and one uterine rupture (spontaneous rupture at 33 weeks).**
 - ▶ **A review of published and unpublished cases yielded 19 instances of uterine rupture during pregnancy following laparoscopic myomectomy.**

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- ▶ **Almost all of the cases contained a deviation from standard technique, as described for abdominal myomectomy. In seven cases, the uterine defect was not repaired; in three cases, it was repaired with a single suture; in four cases, it was repaired in only one layer; and, in one case, only the serosa was closed. A multi-layered closure employed in only three cases.**
 - ▶ **In 16 of the 19 cases, primarily monopolar or bipolar energy was used for hemostasis.**
 - ▶ **Presently, it appears prudent for surgeons who perform laparoscopic myomectomy to adhere to time-tested techniques developed for abdominal myomectomy, including limited use of electrosurgery and use of multi-layered closure of myometrium. Yet, even with ideal surgical technique, individual wound healing characteristics may predispose to uterine rupture.**



ALTERNATIVE LAPAROSCOPIC TECHNIQUES

- ▶ occlusion Uterine artery- Myomas may shrink after uterine artery occlusion, but uterine volume is not reduced to the same extent as myomectomy.
- ▶ This, combined with the exposure of women to general anesthesia and abdominal incisions for both procedures, makes myomectomy the preferred procedure. **No studies have compared these two procedures.**
- ▶ Uterine artery embolization has been compared with laparoscopic uterine artery occlusion, since both treat fibroids with occlusion of the uterine blood supply.

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- ▶ **Laparoscopic occlusion has some advantages compared with uterine artery embolization, including: (1) avoids introduction of foreign bodies (eg, polyvinyl alcohol particles, coils); (2) provides laparoscopic assessment of the pelvis and abdomen; and (3) was associated with less postoperative pain in a prospective cohort study of 46 women.**
 - ▶ **These advantages are superseded by several disadvantages, including that laparoscopic occlusion requires general anesthesia, is invasive, and requires a skilled laparoscopic surgeon.**
 - ▶ **Thus, women who are planning treatment of leiomyomas with blockage of the uterine blood supply are better treated with uterine artery embolization than laparoscopic uterine artery occlusion.**

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- ▶ **Thus, we suggest either laparoscopic myomectomy or uterine artery embolization rather than laparoscopic uterine artery occlusion.**



Myolysis

- ▶ **Myolysis refers to laparoscopic thermal coagulation or cryoablation (cryomyolysis) of leiomyoma tissue to reduce myoma size (by approximately 50 percent) by means of myoma destruction and interference with local vascular supply.**
- ▶ **Laparoscopic myolysis has been performed using a number of energy sources, including bipolar electrosurgery, Nd:YAG laser, and cryogenic probes.**
- ▶ **Myolysis is easier to master than laparoscopic myomectomy, since it does not require laparoscopic suturing.**
- ▶ **localized tissue destruction without repair may increase the chance of subsequent adhesion formation (in one study, dense adhesions were found in 6 of 15 women) or uterine rupture during subsequent pregnancy.**

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- ▶ **Most experts do not recommend myolysis for women who wish future fertility.**
 - ▶ **Candidates for myolysis are further limited to women with fewer than four leiomyomas with the largest leiomyoma less than 10 cm in diameter .**
 - ▶ **Few surgeons have experience with laparoscopic myolysis, and we prefer laparoscopic myomectomy.**



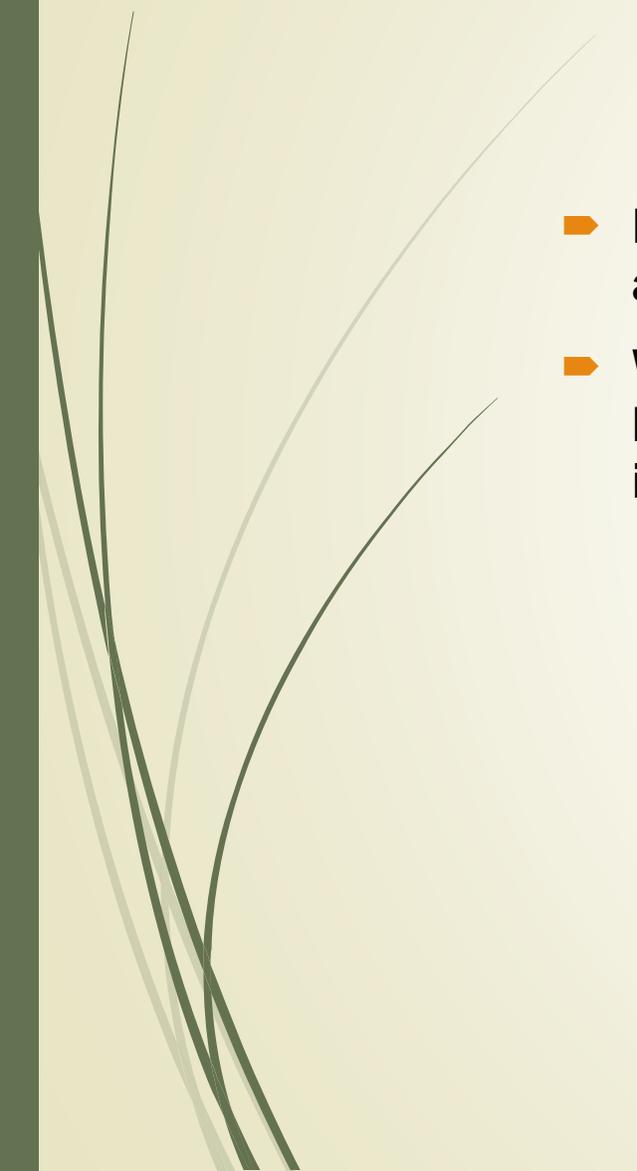
Hysteroscopic myomectomy

- ▶ **Hysteroscopic myomectomy is performed for intracavitary fibroids, ie, submucosal and some intramural leiomyomas for which most of the fibroid protrudes into the uterine cavity.**
- ▶ **The most common indications for hysteroscopic myomectomy are abnormal uterine bleeding, recurrent pregnancy loss, and infertility.**
- ▶ **Hysteroscopic myomectomy is contraindicated in women in whom hysteroscopic surgery is contraindicated (eg, active pelvic infection, intrauterine pregnancy).**
- ▶ **For women planning hysteroscopic myomectomy, we suggest preoperative evaluation of the uterus with saline infusion sonography (SIS).**

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- ▶ **Use of both diagnostic hysteroscopy and transvaginal sonography is a reasonable option where SIS is not available.**
 - ▶ **The following recommendations are for women with fibroid-associated symptoms who desire surgical treatment: We suggest not performing hysteroscopic myomectomy in women with intracavitary fibroids that extend 50 percent or more into the myometrium.**
 - ▶ **Removal of fibroids with deep myometrial involvement requires advanced hysteroscopic skills or myomectomy using laparotomy or laparoscopy.**

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- ▶ **For women with intracavitary fibroids in combination with three or more intramural or subserosal fibroids with a total volume of >3 cm who have fibroid-associated bulk symptoms (abdominal or pelvic pressure or pain, urinary symptoms, constipation), we suggest myomectomy using laparotomy or laparoscopy rather than hysteroscopy .**
 - ▶ **Isolated removal of intracavitary fibroids is reasonable in some women, such as those with menstrual aberrations only, recurrent miscarriage or fibroid-associated leukorrhea.**

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- ▶ **We suggest against use of gonadotropin releasing hormone agonists prior to hysteroscopic myomectomy .**
 - ▶ **Use of these agents is reasonable in women with large fibroids (>3 cm) who are willing to tolerate the vasomotor symptoms and by surgeons who find an operative benefit.**
 - ▶ **Potential complications of hysteroscopic myomectomy include: uterine perforation, excessive absorption of distension fluid with resultant hyponatremia or volume overload, excessive perioperative bleeding, intrauterine adhesions, and infection.**

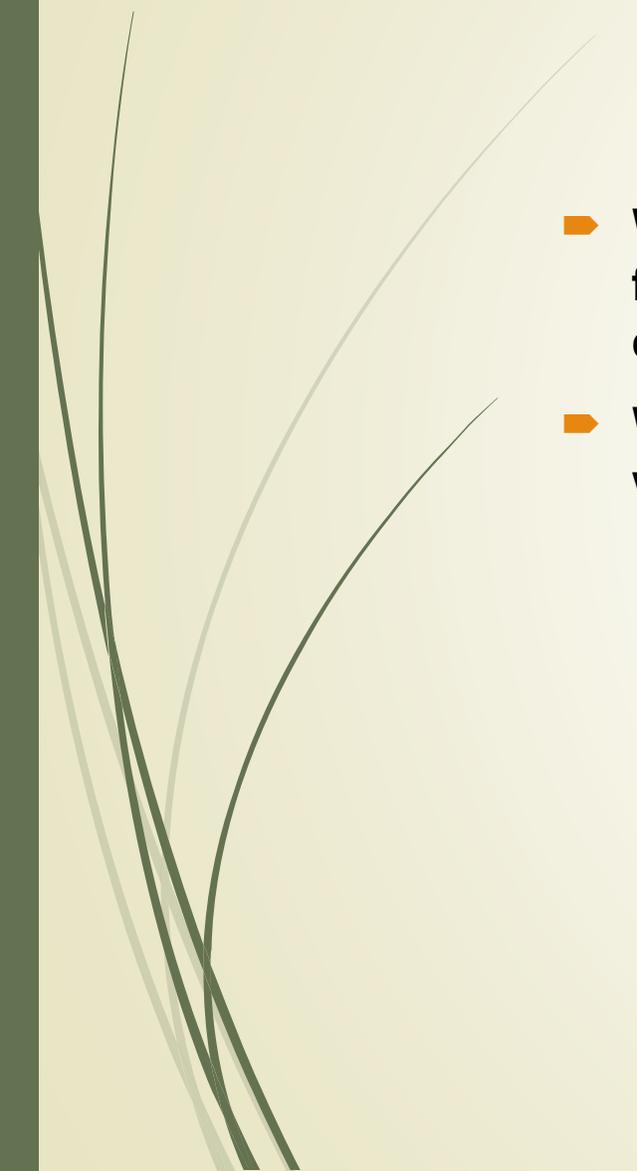
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- ▶ **Following hysteroscopic myomectomy, the recurrence rate of fibroids and/or abnormal uterine bleeding is approximately 20 percent.**
 - ▶ **Women with cavity-distorting fibroids who undergo myomectomy are more likely to conceive a pregnancy; however, the effect on the risk of miscarriage is uncertain.**



Reproductive issues in women with uterine leiomyomas (fibroids)

- ▶ We suggest women with asymptomatic leiomyomas not postpone pregnancy, if possible, since leiomyomas, combined with advanced maternal age, may impair fertility and adversely impact pregnancy.
 - ▶ In women planning pregnancy, we suggest not performing prophylactic myomectomy to prevent pregnancy complications.
 - ▶ The relationship between intramural leiomyomas and infertility is controversial. Couples should complete a full infertility evaluation before addressing the role of leiomyomas in their infertility.
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- ▶ **For women with a myoma that is submucosal or has an intracavitary component, we suggest myomectomy.**
 - ▶ **For women with a myoma that is subserosal, we suggest against myomectomy .**
 - ▶ **For women with intramural fibroids that do not distort the uterine cavity, other sources of infertility should be addressed prior to a myomectomy.**
 - ▶ **The decision to perform a myomectomy should be made based on patient preference and clinical factors (eg, obstructing of a fallopian tube or the cervical canal or failure of other infertility treatments).**

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- ▶ **We suggest myomectomy for women planning to undergo in vitro fertilization who have a submucosal fibroid or an intramural fibroid that deforms the uterine cavity .**
 - ▶ **We suggest surgical myomectomy over medical therapy or embolization for women planning future pregnancies.**

Thank you so much

