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Laparoscopic myomectomy and pregnancy outcome in infertile patients

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Objective: To assess outcomes and pregnancy-related complications after laparoscopic myomectomy in infertile patients.

Design: Retrospective analysis.

Setting: Tertiary care advanced laparoscopic center.

Patient(s): Twenty-eight infertile patients with at least one uterine leiomyoma of >5 cm in diameter.

Intervention(s): Laparoscopic myomectomy.

Main Outcome Measure(s): Occurrence of pregnancy, delivery rate, and pregnancy-related complications.

Result(s): The average size of the myomas removed was 6 cm (range, 4–13.3 cm). None of the procedures were converted to laparotomy. The postoperative rate of intrauterine pregnancy was 64.3% (n = 18), including 1 of 2 patients who underwent concomitant hysteroscopic myomectomy. Four patients had spontaneous abortions and 14 delivered viable term neonates. Six women had a vaginal delivery without complications and 8 had a cesarean section. No antepartum or intrapartum complications were reported.

Conclusion(s): Laparoscopic myomectomy can be offered to patients who want to have children and who refuse to undergo an abdominal myomectomy. Patient selection as well as meticulous surgical technique are the key factors in achieving a successful outcome. (Fertil Steril® 1999;71:571–4. ©1999 by American Society for Reproductive Medicine.)

Key Words: Infertility, leiomyomas, laparoscopic myomectomy, pregnancy

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Uterine myomas are a particularly challenging problem for young women who want to have children. Guidelines for treatment recommend that only symptomatic myomas or those with rapid growth be treated (1). Patients who want to preserve their fertility must receive conservative treatment, either medical or surgical. Gonadotropin-releasing hormone analogues are effective in reducing the size and symptoms of myomas, but side effects prevent their long-term use (2). Other alternatives to surgery include myolysis, cryomyolysis, and embolization (3–5). The possibility of using nonviral vector-mediated thymidine kinase gene therapy as a novel approach for the treatment of uterine myomas was demonstrated recently (6).

The presence of uterine fibroids has been associated with infertility. Fibroids may reduce uterine contractility, affecting sperm migration, and vascular changes can disturb the endometrium and may hinder implantation (7, 8). Rosenfeld (9) proposed that myomectomy be considered in the patient with otherwise unexplained infertility of >2 years' duration. Other investigators (10, 11) have suggested that patients undergoing IVF may benefit from myomectomy before ovarian stimulation. However, because of the presence of concomitant factors, it has been difficult to identify which myomas play a role in a patient's ability to have children.

Even with surgical myomectomy, whether it is performed by laparoscopy or laparotomy, there is a risk of recurrence; hysterectomy is the only definitive treatment. Because of the risk of repeated surgery, patients should be offered the least invasive surgical approach possible.

In the last decade, the technique of laparoscopy has developed significantly. However, laparoscopic myomectomy is a difficult procedure that requires advanced surgical skills, particularly in endoscopic suturing. The number,

size, and location of the tumors limit the use of this approach, but no definitive criteria have been established.

Pregnancy outcome after laparoscopic myomectomy is a more significant concern. Isolated case reports of uterine dehiscence in pregnancy have been published in the medical literature, suggesting that the risk of this complication may not be negligible (12–14).

In view of the limited amount of information available on both pregnancy outcome and pregnancy-related complications, we report a series of infertile patients (n = 28) who underwent laparoscopic myomectomy at our institution.

MATERIALS AND METHODS

Among the 161 patients who underwent laparoscopic myomectomy between March 1986 and November 1997, 28 presented with infertility of at least 12 months' duration. Their mean age was 36.4 years (range, 28–39 years), and they had an otherwise normal infertility evaluation. The evaluation included a semen analysis, day 3 FSH level, pelvic endovaginal ultrasound examination, and hysterosalpingography. All the patients had at least one myoma of >5 cm in largest diameter on preoperative ultrasound examination. This study was approved by our institutional review board.

The patients were observed, and the pregnancy outcome was recorded. The main outcomes recorded were fertility rates after myomectomy and pregnancy outcomes. We excluded from the assessment of fertility rates patients in whom submucous myomas were confirmed at the time of the procedure because they may represent a different population. This subset of patients was included in the analysis of pregnancy outcomes.

Laparoscopic myomectomy was performed as follows. Under general anesthesia with endotracheal intubation, the patient was placed in the low dorsolithotomy position with the legs and feet supported by Direct Placement Stirrups (OR Direct, Acton, MA). Before laparoscopy was performed, all patients underwent a diagnostic hysteroscopy. If submucosal myomas were found on hysteroscopy, they were removed immediately using the resectoscope.

A Valtchev uterine mobilizer (Conkin Surgical, Toronto, Canada) was inserted into the uterine cavity to flex the uterus and delineate the posterior vagina. Laparoscopic myomectomy was performed with a 10-mm umbilical trocar sleeve and two 5-mm lower quadrant trocar sleeves, lateral to the rectus abdominalis muscle and inferior epigastric vessels.

A vertical incision, using a spoon monopolar electrode at high power (150 W pure cut), was made over the most distended part of the myometrium down to the myoma pseudocapsule. The tip of an aquadissector (Wisap, Tomball, TX) was used to dissect between planes, and a 5-mm myoma corkscrew was used to apply traction to the myoma during dissection (15). Monopolar electrosurgery or a CO_2 laser was used to lyse fibrous adhesions between the fibroid and its shell. Vasopressin never was used (16).

After dissection, the most distal surrounding vessels were coagulated before being cut with bipolar forceps. Further bleeding was controlled with bipolar electrosurgery. Thereafter, a piece of Surgicel (Johnson & Johnson, Arlington, TX) was packed into the base of the myometrial defect, which was repaired with 0 Vicryl (Ethicon, Somerville, NJ) sutures and a CT-1 (Ethicon) or CTX (Ethicon) needle, in a simple interrupted fashion (17).

A laparoscopic posterior culdotomy allowed removal of the myoma through the cul-de-sac of Douglas, and morcellation was performed laparoscopically or vaginally with scissors or a scalpel. After laparoscopic closure of the culdotomy with simple interrupted 0 Vicryl sutures, the peritoneal cavity was washed copiously with Ringer's lactate solution. Underwater laparoscopic examination then was performed, complete hemostasis was obtained with microbipolar forceps, and 2–3 L of Ringer's lactate solution was left in the peritoneal cavity to displace CO_2 and potentially reduce adhesion formation.

RESULTS

All the 28 patients studied underwent laparoscopic myomectomy. The average postoperative hospital stay was 9 hours. There were no major postoperative complications. All the patients had large intramural myomas causing uterine cavity distortion that were clearly noted during hysteroscopy. Two had concomitant submucosal myomas, which were removed hysteroscopically.

The average size of the myomas removed laparoscopically was 6 cm. In three patients, we made an intraoperative diagnosis of concomitant disease (two with endometriosis and one with chronic pelvic inflammatory disease).

Eighteen patients, including 1 with a submucous myoma (64.3%), became pregnant without the use of assisted reproductive techniques. Of these, 4 had spontaneous abortions in the first trimester and 14 delivered viable term neonates. Six women had a vaginal delivery without complications and 8 had a cesarean section.

After exclusion of the two patients who underwent concomitant hysteroscopic myomectomy, the fertility rate was 65.35% (17/26).

DISCUSSION

Myomectomy by any route is a controversial subject. The American College of Obstetricians and Gynecologists' criteria for myomectomy include secondary infertility with a history of second trimester loss and preservation of fertility in women with either hypermenorrhea leading to anemia or

a large lower abdominal mass. Extensive myomectomies by laparotomy or laparoscopy are not justified in patients who no longer want to have children because the associated morbidity and mortality are comparable to those of hysterectomy (1).

Many investigators agree that the presence of >4 large myomas (>4 cm in diameter) or of any tumor >10 cm in diameter is a contraindication to laparoscopic surgery and requires medical treatment before surgery to reduce the size and vascularity of the lesions (18). We do not use GnRH before surgery because we have found no difference in the degree of surgical difficulty between a 6-cm and an 8-cm laparoscopic myomectomy. Further, preoperative treatment with GnRH analogues for >3 months may result in degeneration of the myoma, making the surgical dissection more difficult.

A recent comparison of laparoscopic myomectomy (n = 70) with laparotomy (n = 39) suggests that laparoscopic myomectomy should be reserved for patients with <4 myomas with diameters of <7 cm (19). Dubuisson et al. (20) performed 72 laparoscopic myomectomies for intramural myomas measuring ≥5 cm in 71 patients. Only two procedures (2.7%) were converted to laparotomy, and no serious complications were observed. These studies confirm that careful patient selection can decrease the likelihood of complications with laparoscopic myomectomy and avoid the need to convert to laparotomy (21).

Appropriate patient selection is particularly crucial for infertile patients, in whom postoperative adhesions and uterine integrity are key factors in conceiving a child and carrying it to term. Adhesive complications after laparoscopic myomectomy are comparable to those after abdominal myomectomy when an atraumatic technique is used (22). This includes meticulous hemostasis, accurate closure of uterine incisions with sutures, use of atraumatic graspers, and constant irrigation.

The fertility rate in this study (65.35%) was similar to previously published rates. Rosenfeld (9) and Verkauf (23) reported intrauterine pregnancy rates of 66.2% and 66.7%, respectively, after abdominal myomectomy. Dubuisson et al. (24), in a study of 21 infertile patients who underwent laparoscopic myomectomy, obtained an intrauterine pregnancy rate of 33.3%. It must be noted that in this series, 12 patients had other infertility factors associated with the uterine myomas.

Durai et al. (25) reported a pregnancy rate of 48.2% after laparoscopic myomectomy in a group of patients with unexplained infertility. It is interesting to note that in this series, the rate of conversion to laparotomy was 28.7%. This may suggest that the pregnancy rate after the laparoscopic procedure was somehow representative of a patient group with a better prognosis. In our series, all the patients previously selected for surgery underwent laparoscopic myomectomy, with no conversions to laparotomy.

The quality of uterine repair after laparoscopic myomectomy has been debated (26). The case reports of uterine rupture in the literature reflect isolated cases in early experiences with laparoscopic myomectomy (12–14). When appropriate closure of the uterine defect is performed with the use of endoscopic suturing techniques, the outcomes should not be different from those after open-air suturing. No cases of uterine rupture during pregnancy or labor were observed in our series.

A valuable alternative to abdominal myomectomy, laparoscopic myomectomy is still a challenging procedure and requires an experienced laparoscopic surgeon. Laparoscopic myomectomy is best used for patients with a solitary myoma measuring 5–15 cm. For infertile patients, laparotomy still should be considered the standard of care while controlled studies are under way.

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