

Laparoscopic Devascularization of Uterine Myomata Followed by Enucleation of the Myomas by Direct Morcellation

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Abstract

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Most intraoperative conversions of laparoscopic myomectomy to laparotomy reported in the literature occur because of intraoperative bleeding. Devascularization of a uterine myoma at the start of myomectomy would help reduce the blood supply to the uterus and hence to the myoma. Another advantage of the procedure is that the need to separate the myoma from the uterus completely before morcellation, as in conventional laparoscopic myomectomy, is obviated. The tumor can be enucleated only up to about half its circumference by standard enucleation before morcellation is begun. Traction accorded by the 15-mm traumatic serrated-edge claw forceps of the morcellator during morcellation causes progressive separation of the myoma from the uterine wall, thus completing enucleation. In two patients, myomas were devascularized at the outset of myomectomy, in one by intracorporeal suturing of uterine vessels and in the other by laparoscopic bipolar coagulation of uterine vessels.

Laparoscopic myomectomy is subject to many modifications. As the size of myomas being dealt with laparoscopically increases, it is necessary to develop new techniques to circumvent the two main problems of surgery in the case of very large myomas. The first is limited space available for push-pull maneuvers required for complete enucleation of the lesion.¹ The second is hemorrhage. Most intraoperative conversions to laparotomy reported in the literature have been because of intraoperative bleeding.²

In two women, we devascularized the uterus at the start of myomectomy. This helped reduce the blood loss during the procedure. The reduced blood supply to the myoma enabled us to morcellate the tumor directly off the uterus without first completely enucleating it from the uterus.

Case Reports

Patient No. 1

A 39-year-old woman who had completed childbearing was admitted to the hospital with menorrhagia, pain, and a lump in abdomen. She bled for 8 days every month, with passage of clots. Abdominal and pelvic examinations indicated a 22-week-size myomatous uterus. Ultrasound examination revealed a large exophytic subserosal myoma on the posterior wall measuring 13 × 11.4 × 9.4 cm.

Patient No. 2

A 30-year-old woman who had completed childbearing was seen with menorrhagia, pain, and abdominal mass.

Physical examination showed a 26- to 28-week-size myomatous uterus. Ultrasound examination revealed an 11.3 × 7.6-cm fundal subserosal myoma.

Both patients wanted to preserve their uteri and preferred to undergo myomectomy by the laparoscopic route.

Operative Procedure

The women were placed on a liquid diet for 2 days preoperatively to ensure that bowel loops would be empty during the procedure.

With the patients in the supine position and with the bladder catheterized, the Veress needle was placed at Palmer's point and the abdomen was insufflated with carbon dioxide at a preset pressure of 20 mm Hg. Placement of the 10-mm 30-degree foreoblique telescope at the usual intraumbilical site would have caused the scope to be too close to the myoma, resulting in increased magnification and a smaller operating field. This would have made precise manipulation of instruments very difficult. Hence for very large myomas, we place the optical trocar at an appropriate supraumbilical site depending on the size of the uterus and the myoma. We prefer to insert this 10-mm optical trocar supraumbilically under direct vision to circumvent the possibility of damaging major vessels directly beneath the insertion site. To this end, a 5-mm port was first placed in the left lateral upper quadrant lateral to inferior epigastric vessels at the level of the upper limit of the uterus and a 5-mm 30-degree foreoblique telescope was inserted through

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it. The abdominal cavity was surveyed and uterine and myoma size were assessed.

The 10-mm optical trocar was placed supraumbilically in midline under direct vision of the 5-mm telescope. The 5-mm port inserted earlier served as an accessory port for the rest of the procedure. Two more accessory 5-mm ports were placed, one in the right lateral upper quadrant at the same level as the left accessory port, and a third 5-mm port in the left lateral lower quadrant of the abdomen.

Inspection of the abdomen in the first patient revealed a large, subserous, broad-based, degenerated myoma that appeared to arise from the posterior wall extending up to the fundus (Figure 1). The rest of the procedure was completed with the patient in modified lithotomy position. Vasopressin 30 ml at a concentration of 5 IU/100 ml saline solution was infiltrated subcapsularly at several points. The anterior leaf of the broad ligament was opened with laparoscopic scissors on the left side. The triangle enclosed by the round ligament, external iliac artery, and infundibulopelvic ligament was chosen and a vertical incision of about 3 cm was made lateral to the uterus.

The uterine artery on each side was identified (Figure 2) and ligated with intracorporeal sutures using 1 Vicryl. The myoma turned pale after bilateral suturing of these vessels.

A horizontal incision was made on the myoma close to its base along its anterior aspect with the help of bipolar coagulation and laparoscopic scissors. The incision was deepened until the cleavage plane was identified subcapsularly, and the pearly white appearance of the tumor was seen. The cleavage plane was further dissected by coagulating and cutting connective tissue bridges. A 5-mm myoma screw was inserted into the abdomen through the right accessory port, and an attempt was made to insert it into the myoma. But the myoma was very degenerated, and hence it was very difficult to exert traction on it. However, the myoma was enucleated to about one-fourth of its circum-



FIGURE 2. Uterine vessel identified.

ference with the help of the traction afforded by the screw and counter-traction made by the vaginal assistant maintaining a pull on the cervix with the help of a volsellum.

The upper 5-mm left lateral port was converted to a 15-mm port for insertion of the 15-mm serrated-edge electromechanical macromorcellator. The myoma was held with claw forceps of the morcellator, and thin strips were progressively morcellated while the myoma was still attached to the uterus (Figure 3). Morcellation was performed carefully, keeping entry and exit points of the claw forceps always under vision. Although degeneration made it difficult to hold the myoma, it was easier than with the 5-mm screw. The claw forceps was always directed away from the base of the myoma to prevent injury to the uterine wall. When the bulk of the lesion was removed, traction maintained by claw forceps of the morcellator caused progressive enucleation of the myoma from its capsule as well as its base in the uterus. A part of the capsule was

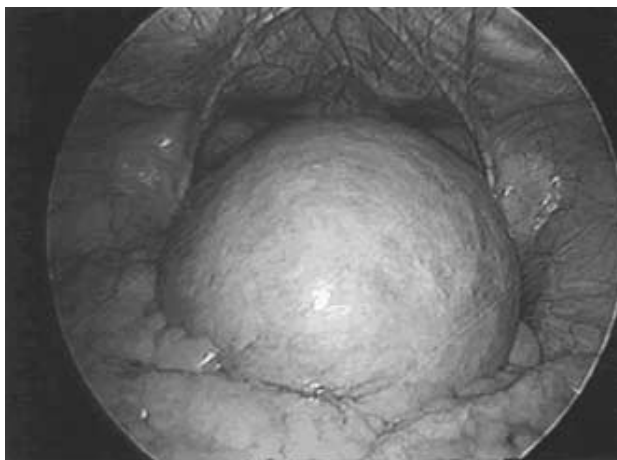


FIGURE 1. Large subserous myoma arising from posterior wall and fundus.



FIGURE 3. Direct morcellation of myoma while still attached to uterus.

also morcellated, as the excess capsule would have to be removed after removal of the myoma. Hemostasis was maintained with bipolar coagulation of major bleeding vessels.

After morcellation was complete, the myometrial wound was repaired in two layers by intracorporeal interrupted sutures with 1 Vicryl on a 40-mm round needle. The peritoneal cavity was irrigated with saline and the 15-mm port was closed with a port-closure needle under direct vision.

The myoma in the second patient was large, fundal, subserous, broad-based, degenerated, and highly vascular, and it occupied the entire upper abdominal cavity (Figure 4). Laparoscopic bipolar coagulation of uterine arteries was performed with a technique described elsewhere.³ Uterine arteries were identified bilaterally and desiccated, but not divided. The myoma turned pale after this application.

The rest of the procedure was the same as in the first patient except for one difference. As the capsule of the myoma was extremely thinned out, it was not necessary to incise it to expose the tumor beneath. The myoma was held directly with claw forceps of the morcellator and was progressively morcellated with the capsule. As the capsule was to be sacrificed anyway at the end of the procedure, removing it with the myoma did not pose difficulty in closing the uterine wall later.

The postoperative course of both women was uneventful. In the first patient, intraoperative blood loss was 500 ml and operating time was 120 minutes. She was discharged on the second postoperative day. In the second patient, intraoperative blood loss was 350 ml and operating time was approximately 90 minutes. She could have been discharged on the second postoperative day, but she preferred to stay in the hospital for an extra day. The weight of the myoma was 400 g (as it was very degenerated) in the first case and 950 g in the second.

The women have been followed for 2 years, during which time they have had no complaints and no recurrence of myomas.

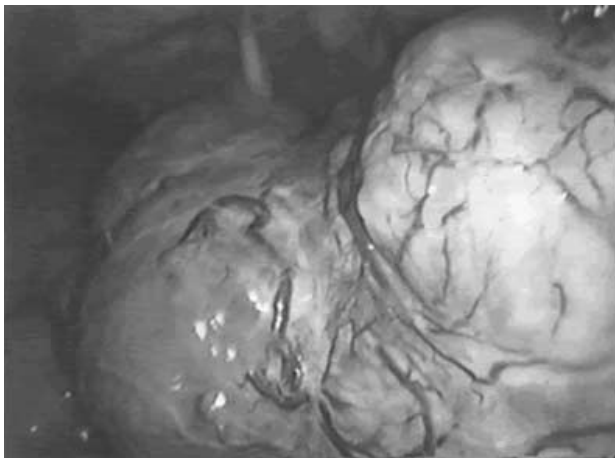


FIGURE 4. Fundal, subserous, large, vascular myoma.

Discussion

Leiomyomas derive their blood supply almost totally from uterine arteries.⁴ Devascularization of the uterus is the basis for many treatment modalities employed for symptomatic myomas, namely, laparoscopic bipolar coagulation of uterine arteries³ and uterine artery embolization.⁵ Both procedures are reported to have good results; however, they devascularize only the myomas and do not remove them. Thus it is imperative postoperatively to follow patients closely for a year or more with repeated ultrasound examinations to document reduction in myoma size. This may be difficult in patients who are not willing for extended follow-up.

The standard technique of laparoscopic myomectomy has some inherent problems when dealing with very large myomas. The limited space available for efficient performance of traction and counter-traction maneuvers necessary for enucleation make surgery technically challenging. This difficulty is compounded by intraoperative bleeding during enucleation. This bleeding is often very difficult to control with bipolar forceps due to the limited space available to maneuver forceps efficiently.

The technique we described combines the advantage of devascularization with removal of the myoma during the surgical procedure (as accomplished in laparoscopic myomectomy). Devascularization allows us to begin morcellation while the myoma is still attached to the uterus and enucleated only to about one-fourth of its circumference. In fact morcellation completes enucleation while removing the myoma from the abdominal cavity, as electromechanical traction by the 15-mm claw forceps causes progressive separation of the myoma from the uterus. The technique thus combines two major steps of standard laparoscopic myomectomy: enucleation and morcellation. This reduces operating time, as it does away with an entire step of complete enucleation before morcellation.

Another advantage is the better and steady traction that can be maintained on the myoma by the 15-mm claw forceps. Traction with a 5-mm or even a 10-mm myoma screw or grasper in standard myomectomy may not be adequate to maneuver a very large myoma or a degenerated myoma efficiently. A degenerated myoma does not offer a good hold for the myoma screw. Repeated repositioning of the screw is also required, and this is quite cumbersome in the limited space available in case of very large myomas. In this technique, as the myoma is progressively morcellated and uterine size is reduced, additional space is created for optimum movement of instruments, especially bipolar forceps, and thus it is easier to maintain hemostasis and thus reduce blood loss.

This technique enabled us to deal with very large myomas laparoscopically in short time and with less blood loss than was possible with standard laparoscopic myomectomy. Devascularization of the myoma at the start of surgery could be performed by either coagulation or intracorporeal or extracorporeal suturing of uterine arteries. In the case of very large myomas, we prefer to suture uterine arteries, as

it may sometimes be difficult to dissect the ureter away from the uterine arteries properly. As coagulation poses the risk of thermal damage to ureters if they have not been fully mobilized, we now perform intracorporeal suturing of uterine vessels for uterine devascularization after these pilot cases.

It must be mentioned that the procedure is a relative contraindication in women who want to preserve their fertility. Also, in those with lateral wall myomas it might be difficult to delineate uterine arteries.

This technique also requires mastery over the morcellator and a skilled camera assistant. A 30-degree foreoblique telescope is preferred, as it is possible to see both entry and exit points of the morcellator through the myoma. One might damage the uterus if the exit point of the morcellator is not seen, but this complication is rare as the myoma is progressively enucleated and is not attached to the uterine wall at the exit site.

Thus, in symptomatic women with fundal or anterior or posterior wall myomas who have completed childbearing and would like to preserve their uterus, this technique could be a reliable alternative to standard laparoscopic myomectomy.

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