

Original Article

Clinical efficiency investigation of laparoscopic uterine artery occlusion combined with myomectomy for uterine fibroids

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Abstract: To investigate the effectiveness of laparoscopic uterine artery occlusion combined with myomectomy for uterine fibroids. From August 2008 to August 2009, forty-eight women with uterine fibroids desiring to preserve their uteri underwent laparoscopic myomectomy. Among them, 18 women received laparoscopic uterine artery occlusion before uterine myomectomy while the others received laparoscopic myomectomy only. All of the 48 cases with uterine fibroids underwent laparoscopic myomectomy successfully, and no patient developed Intraoperative or postoperative complications. The average operation time was (105.6±27.6) min, and the average surgical blood loss was (87.52±18.35) ml. Blocking uterine artery before laparoscopic myomectomy is valuable and feasible for the management of women with symptomatic fibroids. Adopting this method can obtain pleasing therapeutic effect. The method can reduce blood loss thus make the surgical field clean and clear, and it can reduce the operating time and recurrence rate. It can also reduce electro-coagulation on the surgical surface and therefore cause less tissue necrosis and lower incidence of complications.

Keywords: Laparoscopy, myomectomy, uterine artery occlusion

Introduction

Since the 1990s, laparoscopic myomectomy has been widely used clinically [1]. This technique marks the new development stage of laparoscopy in gynecology, which expands the field of minimally invasive operation. At present, the intraoperative bleeding, residual cavity suture, and postoperative recurrence are the major concerns during laparoscopic myomectomy. Most of the young patients desiring to preserve their uteri received laparoscopic myomectomy in our hospital. For patients with symptomatic and multiple uterine fibroids laparoscopic uterine artery occlusion followed by myomectomy was done with good clinical outcomes which are reported in this study.

Materials and methods

Clinical data

From August 2008 to August 2009, forty-eight women with uterine fibroids wanting to retain their uteri underwent laparoscopic uterine myo-

mectomy. Among them, 18 women received laparoscopic uterine artery occlusion before uterine myomectomy while the others received laparoscopic myomectomy only. The inclusion criteria are as follows: (1) The symptomatic uterine fibroids were ≥5 cm in size; (2) The number of fibroids is not more than seven by B-ultrasonography; (3) The main clinical symptoms are menorrhagia and pelvic occupying lesions (including pelvic mass, compression symptoms, etc); (4) The level of serum AFP, CEA, CA125, and CA199 are assessed preoperatively to eliminate potential malignancy. For eliminating cervical cancer, cervical cytology examination are performed as routine; (5) Diagnostic curettage was performed for patients with menorrhagia, irregular menstruation, or endometrial thickness more than 14 cm under ultrasound to rule out endometrial malignant lesions.

Operation method

Preoperative preparation: All patients received vaginal irritation, fasting, and bowel preparation before operation. All procedures were per-

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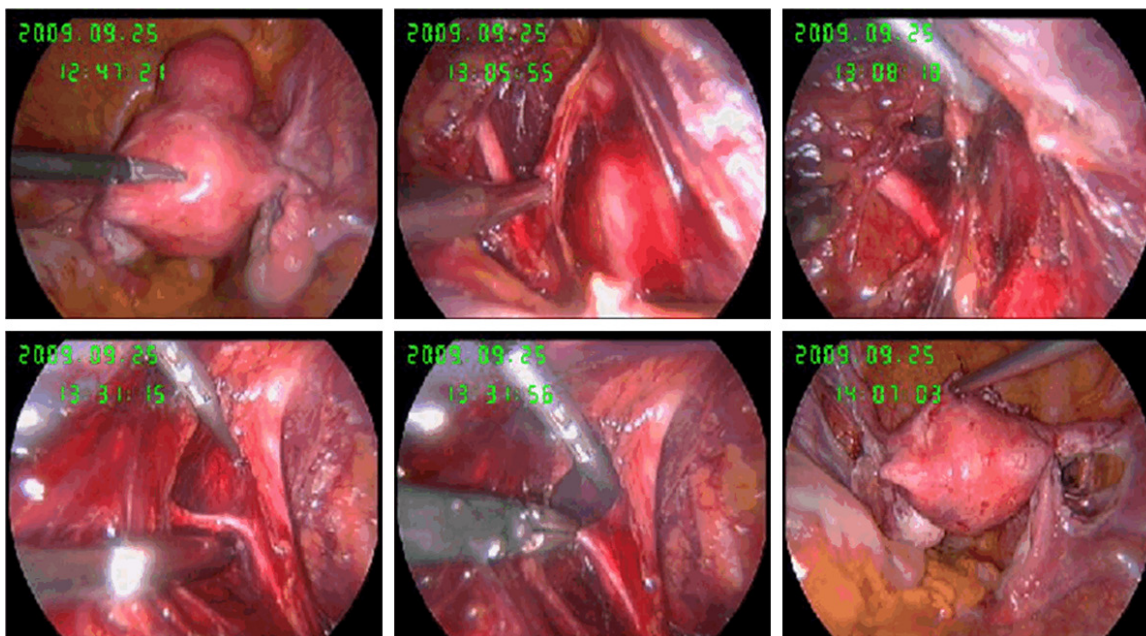


Figure 1. The methods of laparoscopic uterine artery occlusion.

formed under general endotracheal anesthesia. All patients were placed in the dorsal lithotomy position with feet high and keeping catheter. Carbon dioxide gas was injected through a subumbilical Veress needle to establish pneumoperitoneum, and the carbon dioxide pneumoperitoneum pressure was set at 12~15 mmHg. The STROZ laparoscopic system was used and four puncture points were made.

Laparoscopic uterine artery occlusion (**Figure 1**): The triangle formed by round ligament, infundibulopelvic ligament, and pelvic wall was opened. The peritoneal bridge was incised 3-5 cm along the infundibulopelvic ligament. The incision was extended downward and outward to expose the external iliac artery and vein. After the dissection of the anterior branch of internal iliac artery, the uterine artery is identified as the first branch. Then the uterine artery was freed for a distance of more than 2 cm. After that plasmakinetic scalpel was used to occlude the uterine artery with a coagulation width of 1 cm. During the dissection and electric coagulation of uterine artery, injuries of large vessels injury and ureter should be avoided.

Myomectomy: An incision was made over the fibroid and carried deeply until fibroid tissue with the unipolar electric knife or ultrasonic knife. Then the myoma was pulled and stripped

with the unipolar electric knife or ultrasonic knife, and the pedicel was coagulated and cut with a PlasmaKinetic knife. The residual cavity was closed with the 2 # absorbable suture and knotted directly under laparoscopy. All fibroids are morcellated in the peritoneal cavity and removed through the 10 mm Troca in the left lower abdomen. At last drainage tube was put through the 5 mm incision in the right lower abdomen.

Statistical analysis

The data were analyzed with the SPSS software and comparison between groups was performed by 2-tailed non-parametric t-test. Statistical significance was defined as a $P < 0.05$.

Results

Surgical cases

All operations were successfully completed, and there was no conversions to laparotomy, no cases of vessels tear or other uncontrolled bleeding, no injuries of ureter, bladder and other neighboring organs. The average operating time was (105.6 ± 27.6) min, and the average surgical blood loss was (87.52 ± 18.35) ml (**Table 1**). The size and number of uterine fibroids stripped intraoperative was basically in

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Table 1. Comparison of the operation related index between two groups (X±SD)

Group	Number	Operation time	Blood loss	Complications	hospital stay
research group	18	105.6±27.6	87.52±18.35	0	7.1±2.5
control group	30	91.3±30.2	163.13±26.75	0	8.9±3.2
P		>0.05	<0.05		<0.05

line with that showed by ultrasound before surgery.

Postoperative situation

All patients back to the room had stable vital signs. The 24 h drainage fluid was 60~90 ml, and the mean time of anal aerofluxus was 31 h. The wound of all patients was good and no reject reaction. Pathology report confirmed the diagnosis of uterine leiomyoma. The postoperative stay was 4-7 days and the mean time was 5.5 d. There were 4 cases with hypomenorrhea and 13 cases decreased significantly in the study group. There were 4 cases with no menstruation change, 16 cases with hypomenorrhea, and 9 cases decreased significantly in the control group. There was 1 case with amenorrhea more than five months after surgery in the study group. By comparing and Studying, there was no difference in the incidence of amenorrhea between the two groups.

Postoperative follow-up

All cases were followed up for 2~6 months postoperatively, and there was no case of recurrence and complications. After the operation, clinical symptoms of patients were obviously improved. No patients had adenomyosis. There was 1 case of amenorrhea occurred in the study group, but it developed more than five months after surgery. Compared with the control group there was no difference in the incidence of amenorrhea.

Discussion

Uterine fibroids are the most frequent solid benign tumors in women of reproductive age, especially between 30 and 50. As we know, the established and conventional treatment for patients who wish to preserve their uteri is abdominal myomectomy. But traditional operation has the disadvantages of major abdominal trauma, relatively slow recovery and abdominal wall scar. Laparoscopic myomectomy is a safe and well-accepted technique, because it makes

up for the deficiency of laparotomy and offers minimal postoperative discomfort, and a rapid convalescence. In our study, all patients with uterine fibroids underwent laparoscopic myomectomy successfully, and there were no conversions to laparotomy in the two groups.

The key of laparoscopic myomectomy lies in the processing and suture of the residual cavity. The musculus suture technique was performed in most cases, and during the follow-up no patient was found to have adenomyosis. The key point of uterine artery occlusion was the successful exposure of uterine artery. PlasmaKinetic system was used to coagulate and occlude the blood vessels, which prevented vessels tear and urethral injuries. In this study no vessels tear and urethral injuries occurred. More and more patients with uterine fibroids in reproductive age desire to retain their uterus and choose laparoscopic myomectomy. Laparoscopic myomectomy has the advantages of minimal trauma, no major scar, faster recovery, and good efficacy. Nevertheless, laparoscopic myomectomy has the disadvantage of difficulty to stop bleeding and thus more bleeding volume. Besides, the uterus can't be touched and the small myoma will residue, which leads to high recurrence rate. In our study it is found that uterine artery occlusion could reduce the intraoperative bleeding. Our study showed the mean blood loss was (89.76±18.35) ml in research group and (153.33±26.78) ml in control group, and there were significant difference in the two groups. According to these results, uterine artery occlusion can effectively reduce blood loss during the operation. As reported by NEZHAT et al [2] the recurrence rate of laparoscopic myomectomy within the 2-year follow-up period was 33.13%. In order to reduce the recurrence of uterine fibroids, Liu et al [3] primarily reported laparoscopic uterine artery occlusion combined with myomectomy for uterine fibroids as a new method for treating symptomatic myomas in 2000. Domestic scholars [4, 5] adopted this technique and achieved good effect.

According to the application of uterine artery embolization in gynecological massive hemorrhage, the uterine artery occlusion followed by myomectomy is performed in combination with the existed laparoscopic techniques. As suggested by anatomy, if the uterine artery is occluded the collateral circulation will be established from vaginal artery, branch of ovarian artery, and small pelvic arteries to supply blood for the uterus. Some scholars [6] monitored the blood flow changes of uterus and fibroid before and after uterine artery embolization by color Doppler, and found that collateral circulation was established after 6 months of uterine artery embolization. At that time, myometrium had regained normal blood supply, but the blood flow in the center and periphery of the uterine fibroids was not restored. This was because the blood supply of uterine fibroids was more abundant than that of the myometrium and it was first affected after uterine artery embolization. This suggested that during laparoscopic myomectomy uterine artery occlusion could induce gradual necrosis of the residual small myomas and reduce the recurrence of myomas.

Huang et al [7] performed laparoscopic uterine artery occlusion combined with myomectomy for symptomatic uterine fibroids among 48 patients desiring to preserve their uteri, and detected the basal level of blood sex hormone before operation, 3 months after operation, and 6 months after operation. It was found that there were no differences in the level of LH, FSH, and E2 between pre-operation and post-operation. There was 1 case with amenorrhea more than five months after surgery in the study group. Compared with the control group which had no amenorrhea, there was no difference in the incidence of amenorrhea, so we inferred that laparoscopic uterine artery occlusion combined with myomectomy for uterine fibroids had little interference on the ovary reserve function.

In conclusion, laparoscopic uterine artery occlusion combined with myomectomy for uterine fibroids will have a broad prospect. Although it has high technical requirement and great difficulty in operation, it will widen the indication of laparoscopic myomectomy. It will improve the clinical symptoms of uterine fibroids, avoid the recurrence, and fulfill the demand of patients to retain their uteri.

Disclosure of conflict of interest

None.

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