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Curative Effect and Complication Rate of Abdominal Myomectomy and Laparoscopic Myomectomy in the Treatment of Uterine Fibroids

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Abstract: *Objective:* To compare and analyze the clinical efficacy and complication rate of abdominal myomectomy with those of laparoscopic myomectomy in uterine fibroids. *Methods:* This study was carried out from January 2021 to January 2023 on 150 patients with uterine fibroids. The patients were divided into two groups, a study group (n = 75) and a control group (n = 75), by digital table grouping. Patients in the control group underwent abdominal myomectomy, whereas patients in the study group underwent laparoscopic myomectomy. Surgery-related indicators, incidence of complications, ovarian function indicators, recurrence rate, and pregnancy rate were compared between the two groups. *Results:* The surgery-related indicators of the study group were lower than those of the control group ($P < 0.05$); the incidence of postoperative complications was lower in the study group than in the control group ($P < 0.05$); the postoperative ovarian function indicators of the study group were lower than those of the control group ($P < 0.05$); there were no significant differences in postoperative recurrence rate and pregnancy rate between the two groups ($P > 0.05$). *Conclusion:* For patients with uterine fibroids, abdominal myomectomy and laparoscopic myomectomy have similar recurrence and pregnancy rates, but laparoscopic myomectomy can shorten the recovery time and reduce the incidence of complications and the impact on ovarian function. Therefore, the latter should be applied in clinical settings.

Keywords: Abdominal myomectomy; Laparoscopic myomectomy; Uterine myoma; Complications

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1. Introduction

Uterine fibroids are common benign tumors of the reproductive system in women aged 30–50. They are formed by hyperplasia of uterine smooth muscle tissue. In the early stage of the disease, patients may not have any obvious discomfort. As the tumor volume increases, it may lead to abnormal menstruation, symptoms of tumor compression, lower abdominal discomfort, abnormal vaginal discharge, and other symptoms. It may also affect pregnancy. Surgery is the main treatment option for uterine fibroids. Through intraoperative operations, the tumor can be removed, and symptoms can be relieved [1]. Myomectomy allows the removal of fibroids, while maintaining the relative integrity of the uterus and preserving the patient's reproductive function. This procedure is suitable for patients who wish to have children in the future. Abdominal myomectomy is widely used clinically and has certain advantages. It is a simple procedure and provides a clear field of vision, but the surgical trauma is large, and the recovery time is long [2]. Laparoscopic myomectomy, on the other hand, is a minimally invasive procedure, which can reduce blood loss and interference to the internal environment of the body as well as shorten the recovery time [3].

In this study, 150 patients with uterine fibroids were selected to compare and analyze the curative effect and complication rate of abdominal and laparoscopic myomectomy.

2. Materials and methods

2.1. General information

This study was carried out from January 2021 to January 2023. A total of 150 patients with uterine fibroids admitted to our hospital were selected and divided into two groups, a study group (n = 75) and a control group (n = 75), by digital table grouping. The age range of the patients in the study group was 32–44, with an average of 38.75 ± 2.69 years, and the duration of disease ranged from 5 to 18 months, with an average of 11.59 ± 2.76 months. The age range of the patients in the control group was 31–46, with an average of 38.86 ± 2.73 years, and the duration of the disease ranged from 4 to 18 months, with an average of 11.52 ± 2.71 months. There were no significant differences in general data between the two groups ($P > 0.05$).

Inclusion criteria: (i) patients who met the diagnostic criteria for uterine fibroids; (ii) patients with indications for myomectomy; (iii) patients who voluntarily cooperated in this study.

Exclusion criteria: (i) patients with other uterine diseases; (ii) patients with malignant endometrial lesions; (iii) patients with uterine fibroids at uncommon sites.

2.2. Surgical procedure

The patients in the control group underwent abdominal myomectomy. The patients were kept in a supine position, and general anesthesia was initiated under tracheal intubation. After the anesthesia had taken effect, an incision of 6–8 cm in length was made over the lower abdomen. The myometrium was separated, and the peritoneal tissue was opened. The position of the uterus was determined by exploration, and the uterus was lifted with surgical instruments. The location, size, and number of fibroids were observed. The uterine fibroids were clamped and lifted. Blunt separation of the fibroids and surrounding tissues was performed, completely removing the uterine fibroids. The uterus was returned to the pelvic cavity after the procedure, and the pelvic cavity was washed with normal saline. The incision was sutured after hemostasis.

The patients in the study group underwent laparoscopic myomectomy. The patients were kept in the bladder lithotomy position, and general anesthesia was initiated under endotracheal intubation. After the anesthesia had taken effect, a longitudinal incision of 1 cm in length was made over the upper edge of the patient's umbilicus. An artificial carbon dioxide gas peritoneum (pressure was 12–14 mmHg) was established using a Veress needle introduced through a periumbilical puncture. After creating a pneumoperitoneum, the Veress needle was withdrawn, two incisions of 5 mm in length were further made above the level of the pubic symphysis on the left and right lower abdomen to insert the trocar and laparoscope, respectively. The laparoscope was used to observe the anatomical location, size, and quantity of uterine fibroids, determine the type of fibroids, and decide on the removal plan. For subserosal fibroids without uterine fibroid pedicle, the uterine fibroid capsule was cut circularly. The uterine fibroids were removed, and the uterus was sutured. For uterine fibroids connected to the uterus through the pedicle, the pedicle was tied, the uterine fibroids were removed about 0.5 cm above the knotted area, and electrocoagulation was performed to stop the bleeding. For intramural fibroids, 12 U of pituitary hormone was injected into the myometrial tissue around the most prominent part of the uterine fibroids, the most prominent part of the uterine fibroids was cut, and pulling and rotating motions were performed to remove the fibroids. The uterus was sutured, and electrocoagulation was performed to stop bleeding. The pelvic cavity was flushed with normal saline, the uterus was sutured, the pneumoperitoneum was relieved, and the abdominal cavity was closed after the surgical instruments were taken out. Postoperatively, the pelvic tissue was monitored for active bleeding, and antibiotics were used to prevent infection.

2.3. Outcome evaluation

(i) The surgery-related indicators of both groups of patients, including intraoperative blood loss, time to ambulation, time to first passage of flatus, and length of hospital stay, were observed and compared.
(ii) The incidence of postoperative complications in both groups of patients was compared.
(iii) Before surgery and 3 months after surgery, 3 mL of fasting venous blood samples were collected from both groups of patients, and colloidal gold technique was used to detect the levels of luteinizing hormone (LH) and follicle-stimulating hormone (FSH).
(iv) The two groups of patients were followed up 6 months postoperatively, and the pregnancy rate and recurrence rate were determined.

2.4. Statistical analysis

SPSS 23.0 was used for data analysis. Measurement data were expressed as mean ± standard deviation, and *t*-test was used. Count data were expressed as percentage (%), and χ^2 test was used. $P < 0.05$ indicated statistically significant difference.

3. Results

3.1. Surgery-related indicators

As shown in **Table 1**, the surgery-related indicators of the study group were lower than those of the control group ($P < 0.05$).

Table 1. Comparison of surgery-related indicators between the two groups of patients

Group	Intraoperative blood loss (mL)	Time to ambulation (h)	Time to first passage of flatus (h)	Length of hospital stay (d)
Study group (n = 75)	81.25 ± 4.77	25.64 ± 2.82	16.84 ± 1.93	4.05 ± 1.12
Control group (n = 75)	129.48 ± 7.95	33.75 ± 4.69	27.52 ± 2.86	6.94 ± 1.88
t	45.052	12.834	26.807	11.437
P	0.000	0.000	0.000	0.000

Data are expressed as mean ± standard deviation.

3.2. Incidence of postoperative complications

As shown in **Table 2**, the incidence of postoperative complications of the study group was lower than that of the control group ($P < 0.05$).

Table 2. Comparison of the incidence of postoperative complications between the two groups

Group	Surgical site infection	Pelvic adhesions	Frequent urination	Complication rate
Study group (n = 75)	0	1	2	3 (4.0)
Control group (n = 75)	3	4	3	10 (13.3)
χ^2				4.126
P				0.042

Data are expressed as n (%).

3.3. Ovarian function indicators

As shown in **Table 3**, the postoperative ovarian function indicators of the study group were lower than those of the control group ($P < 0.05$).

Table 3. Comparison of ovarian function indicators between the two groups

Group	LH (U/L)		FSH (U/L)	
	Preoperative	**Postoperative**	**Preoperative**	**Postoperative**
Study group (n = 75)	18.22 ± 1.45	18.75 ± 1.64	18.44 ± 1.68	20.11 ± 1.62
Control group (n = 75)	18.29 ± 1.38	22.03 ± 2.19	18.47 ± 1.73	24.35 ± 2.24
t	0.303	10.382	0.108	13.283
P	0.762	0.000	0.914	0.000

Data are expressed as mean ± standard deviation.

3.4. Pregnancy and recurrence rates

As shown in **Table 4**, there were no significant differences in postoperative pregnancy and recurrence rates between the two groups ($P > 0.05$).

Table 4. Comparison of pregnancy and recurrence rates between the two groups

Group	Pregnancy rate	Recurrence rate
Study group (n = 75)	38 (50.7)	3 (4.0)
Control group (n = 75)	35 (46.7)	4 (5.3)
χ^2	0.240	0.149
P	0.624	0.698

Data are expressed as n (%).

4. Discussion

Uterine fibroids are common benign tumors in gynecology. The etiology of uterine fibroids is related to genetics and abnormal levels of sex hormones. There are various types of uterine fibroids, including submucosal fibroids, subserosal fibroids, intramural fibroids, *etc*. Patients with uterine fibroids commonly present with dysmenorrhea, increased menstrual flow, compression symptoms, abnormal leukorrhea, pain and swelling over the lower abdomen, *etc*. [4]. Clinically, patients with uterine fibroids are treated with surgery. Myomectomy is a procedure to remove fibroids, while preserving the uterus, thereby satisfying patients' reproductive needs. Myomectomy is currently the mainstream surgical solution for uterine fibroids [5].

Abdominal myomectomy is a conventional treatment for uterine fibroids. It has a wide range of surgical indications and can be applied to the treatment of uterine fibroids in different locations, volumes, and numbers. The surgical field of view is wide and clear, allowing the surgeon to palpate them. Submucosal fibroids and small fibroids can be found. The lesions are clearly exposed during the procedure, and the fibroids can be removed completely. In abdominal myomectomy, a long and deep incision is made. This seriously interferes with the internal environment of the body during the surgery. The incidence of complications during the postoperative recovery period is high, and the recovery time is long. On the other hand, laparoscopic myomectomy is a minimally invasive technique. Its main advantages are as follows: (i) since a laparoscope is inserted through a small incision during surgery to observe the fibroids, the number, anatomical location, and size of the fibroids can be determined and physicians can remove the uterine fibroids under direct vision, thus ensuring the completeness of procedure [6]; (ii) electrocoagulation is used in laparoscopic myomectomy to stop bleeding, and the precision of the procedure contributes to preventing injury to the surrounding tissues and organs of the myoma and reducing the amount of blood loss during surgery; (iii) the operation environment is relatively closed, and the operation accuracy is high, which can

reduce the interference to the internal environment of the body; in addition, the incision is small, which can shorten the postoperative recovery time and reduce the risk of postoperative complications [7].

The present study showed that the surgery-related indicators of the study group were better than those of the control group, suggesting that laparoscopic myomectomy can reduce intraoperative blood loss and shorten postoperative recovery time. Analyzing the reason, laparoscopic myomectomy is performed through a small incision, and bipolar electrocoagulation is performed to stop the bleeding, thus completing hemostasis. During the procedure, magnification of the laparoscope is used to prevent damage to surrounding tissues and organs; in that way, patients lose less blood during surgery. Laparoscopic myomectomy is also performed in a relatively closed environment, which can keep the internal environment of the body stable. The small incision can reduce postoperative pain at the incision site, thereby shortening the recovery time and length of hospital stay [8]. Moreover, the results showed that the incidence of postoperative complications in the study group was lower than that in the control group, suggesting that laparoscopic myomectomy can reduce the incidence of postoperative complications. Analyzing the reasons, since laparoscopic myomectomy adopts a small incision approach, the incidence of surgical site infection is low, and since patients can ambulate early after surgery and the time to first flatus is shortened, the incidence of complications such as pelvic adhesions and frequent urination is low. In the present study, the postoperative ovarian function indicators of the study group were lower than those of the control group, suggesting that laparoscopic myomectomy can reduce the impact on ovarian function. Analyzing the reasons, since the incision is small and the procedure follows a minimally invasive approach, the stability of the adrenaline system can be maintained, the release of LH and FSH can be inhibited, the level of hormones in the body can be controlled, and the impact of surgery on ovarian function can be reduced [9]. This study showed that there were no significant differences in postoperative recurrence and pregnancy rates between the two groups, suggesting a similar efficacy between abdominal myomectomy and laparoscopic myomectomy in the long run. Although both abdominal myomectomy and laparoscopic myomectomy can achieve good therapeutic outcomes, the laparoscopic approach results in less surgical trauma and can accelerate the recovery process, underwriting its value in clinical application and promotion. At the same time, not all patients with uterine fibroids are suitable for laparoscopic myomectomy. If the patient has multiple uterine fibroids that are large in diameter and located at uncommon areas, conventional abdominal myomectomy is recommended. During laparoscopic myomectomy, surgeons must be skilled in the major components of the procedure, standardize the approach, remove the myoma, and constantly sum up their experience in practice to improve the surgical effect [10].

In conclusion, although the postoperative pregnancy and recurrence rates of patients with uterine fibroids treated by abdominal myomectomy and laparoscopic myomectomy are similar, the latter approach can shorten the recovery time, reduce the incidence of complications, and alleviate the impact on ovarian function. Therefore, the procedure should be widely used in clinical settings. Considering the small sample size of the present study, the short study duration, and that no comparative research and analysis of the same type of data were carried out, the mechanism of removal via treatment still requires further exploration.

Disclosure statement

The author declares no conflict of interest.

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