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Research and Discussion on the Application and Therapeutic Value of Laparoscopic Appendectomy in the Treatment of Appendicitis

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Abstract: *Objective:* To analyze the clinical effect of standardized laparoscopic appendectomy during the treatment of patients with appendicitis. *Methods:* The time selection range of this study is: 2021.1–2024.12. The subjects of this study are patients with appendicitis. The total sample size included in this study is 90 cases. The grouping method is the computer drawing method. The names of the groups are: the control group and the observation group. There are 45 patients in the front group and 45 patients in the back group. The former group received routine treatment and the latter group received a laparoscopic appendectomy. All indicators for both groups were observed. *Results:* Statistical results showed that the treatment effect (95.56%/77.78%) increased in the observation group, and there was a large difference between the two groups, $P < 0.05$. Comparison of the actual data on complications in this study found that there was a large difference between the two groups (2.22%/15.56%), $P < 0.05$. Statistical research results of surgical indicators showed that the observation group showed a decreasing trend, and the data comparison between the two groups was quite different, $P < 0.05$. Statistical research results of inflammatory factor levels (TNF-α, IL-1β, IL-4) showed that the observation group showed a decreasing trend, and the data comparison between the two groups was quite different, $P < 0.05$. The statistical research results of quality of life (QOL-100) showed that the observation group showed an increasing trend, and the data comparison between the two groups was quite different, $P < 0.05$. *Conclusion:* Laparoscopic appendectomy in the treatment of appendicitis can reduce complications, shorten operation time, reduce the level of inflammatory factors, and improve the quality of life, and is worthy of application and promotion.

Keywords: Appendicitis; Laparoscopic appendectomy; Treatment effect; Complications; Application value

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1. Introduction

In clinical practice, appendicitis is one of the common acute abdominal diseases with greater harm. Open appendectomy is characterized by large trauma, slow recovery, and insufficient effect [1]. Laparoscopic surgery has obvious advantages over open surgery and is widely used in clinical practice. In the actual treatment process, laparoscopic appendectomy

can effectively eliminate the symptoms caused by appendicitis, reduce postoperative complications, and improve the overall treatment effect of the patient [2]. At the same time, minimally invasive surgical technology can significantly reduce surgical trauma, reduce pain, and significantly improve comfort for patients with appendicitis. It also plays a major role in shortening recovery time and helps patients return to normal life as soon as possible. This article selects patients with appendicitis (the time range of this study: 2021.01~2024.12) for analysis, and observes the application value. The report is as follows.

2. Materials and methods

2.1. General information

Period: 2021.1–2024.12. Research object: patients with appendicitis. A total of 90 cases were included in the sample. The grouping method was the computer lottery method. The names of the groups were the control group and the observation group. The sample sizes of the two groups were both 45. The male/female cases in the control group were 28/17 in order. The minimum and maximum age values were 52 years old, 84 years old, and (68.52 ± 4.17) years old. Divided according to disease types: the numbers of acute simple, acute gangrenous, or acute suppurative appendicitis were counted as 20, 14, and 11, respectively. The observation group consisted of 29/16 males and 16 females, with the minimum, maximum, and average ages of 55, 81 and (68.49 ± 4.21) years. The number of patients with acute simple appendicitis, acute gangrenous appendicitis, and acute suppurative appendicitis was evaluated as 18, 15, and 12, respectively. After comparing the gender and age data of the two groups of patients, there was no statistical difference ($P > 0.05$), and a comparative analysis can be performed.

2.2. Method

The control group received routine treatment, specifically as follows: First, tracheal intubation and epidural anesthesia were performed. Medical staff made an incision from the patient's McBurney's point, then removed the appendix and placed drainage tubes appropriately for drainage.

The surgical method for appendicitis patients in this study in the observation group was laparoscopic appendectomy. Appendicitis patients were anesthetized with endotracheal intubation and placed in the supine position. An incision was made below the patient's umbilical cord, with the length controlled to about 1 cm. Then, the medical staff slowly inserts the pneumoperitoneum needle along the patient's incision position and adjusts the pneumoperitoneum pressure. Under normal circumstances, it is controlled at 12–15 mmHg. After inserting a 10mm cannula, the appendix of the patient with appendicitis is explored, and the location of the lesion in the patient with appendicitis is closely observed and clarified. The medical staff inserted a 10mm cannula in the patient's left lower abdomen. Then, the medical staff inserted a 5 mm cannula. Then, the abdominal fluid of the patient with appendicitis is sucked out to expose the appendix of the patient with appendicitis, and the appendix of the patient with appendicitis is lifted up after separating the adhesions around the appendix. The free mesentery is used to clamp the root of the appendix in patients with appendicitis using a silk thread. Cut off 5mm from the root and then clean the abdominal cavity of the patient with appendicitis. The cleaning solution is normal saline and metronidazole.

2.3. Observation indicators

(1) Therapeutic effect

(2) Compare the incidence of complications (infection, bleeding, intestinal obstruction) [3]

(3) Surgical indicators [4]

(4) Compare the levels of inflammatory factors, including TNF-α values, IL-1β values, and IL-4 values [5]

(5) To compare the quality of life, the evaluation method is the QOL-100 scale, and the scores of each dimension are 100 points [6].

2.4. Statistical methods

SPSS27.0, measurement data: mean ± standard deviation (SD), t test, count data: n,%, χ^2 test, $P < 0.05$, the difference is statistically significant.

3. Results

3.1. Comparing treatment effects

Statistical research results showed that the treatment effect (95.56%/77.78%) showed an increasing trend in the observation group, and the data comparison between the two groups was quite different, $P < 0.05$ (**Table 1**).

Table 1. Comparison of treatment effects between two groups [n/(%)]

Group	Effective	Valid	Invalid	Satisfaction (%)
Control group ($n = 45$)	17 (37.78)	18 (40.00)	10 (22.22)	35 (77.78)
Observation group ($n = 45$)	19 (42.22)	24 (53.33)	2 (4.44)	43 (95.56)
χ^2	----	----	----	6.153
P	----	----	----	0.013

3.2. Comparison of complication rates

Statistical research results showed that the incidence rate of complications (2.22%/15.56%) showed a decreasing trend in the observation group, and there was a large difference in the data between the two groups, $P < 0.05$ (**Table 2**).

Table 2. Comparison of complication rates between the two groups [n/(%)]

Group	Infection	Bleeding	Intestinal obstruction	Incidence rate (%)
Control group ($n = 45$)	3 (6.67)	2 (4.44)	2 (4.44)	7 (15.56)
Observation group ($n = 45$)	0 (0.00)	1 (2.22)	0 (0.00)	1 (2.22)
χ^2	----	----	----	4.939
P	----	----	----	0.026

3.3. Comparing surgical indicators

Statistical research results of surgical indicators showed that the observation group showed a decreasing trend, and the data comparison between the two groups was quite different, $P < 0.05$ (**Table 3**).

Table 3. Comparison of surgical indicators between the two groups (mean ± SD)

Group	Operation time (min)	Intraoperative blood loss (mL)	Time to get out of bed (h)	Length of stay (d)
Control group ($n = 45$)	50.02 ± 1.52	26.13 ± 1.54	2.05 ± 0.36	7.48 ± 1.24
Observation group ($n = 45$)	40.21 ± 2.23	12.24 ± 2.06	1.81 ± 0.11	5.24 ± 1.13
t	24.384	36.227	4.276	8.956
P	0.000	0.000	0.000	0.000

3.4. Compare inflammatory factor levels

Statistical research results of inflammatory factor levels (TNF-α, IL-1β, IL-4) showed that the observation group showed a decreasing trend, and the data comparison between the two groups was quite different, $P < 0.05$ (**Table 4**).

Table 4. Comparison of inflammatory factor levels between the two groups (mean ± SD)

Group	TNF-α (pg/mL)		IL-1β (pg/mL)		IL-4 (ng/L)	
	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Control group ($n = 45$)	70.38 ± 7.27	41.42 ± 6.63	33.36 ± 3.71	22.46 ± 2.78	60.28 ± 7.81	56.13 ± 7.46
Observation group ($n = 45$)	70.46 ± 7.39	28.58 ± 4.49	33.19 ± 3.53	17.42 ± 1.36	60.51 ± 7.67	52.78 ± 7.52
T	0.051	10.756	0.222	10.924	0.140	2.121
P	0.958	0.000	0.824	0.000	0.888	0.036

3.5. Comparison of quality of life

The statistical research results of quality of life (QOL-100) showed that the actual data of both groups increased, and the observation group was more significant, $P < 0.05$ (**Table 5**).

Table 5. Quality of life (mean ± SD)

Group	Social relations (points)		Mental state (minutes)		Physical function (minutes)		Physiological functions (points)	
	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Control group ($n = 45$)	53.17 ± 2.56	69.32 ± 3.52	58.36 ± 3.78	68.79 ± 3.82	55.39 ± 4.48	63.23 ± 4.46	59.52 ± 2.39	65.84 ± 3.56
Observation group ($n = 45$)	53.38 ± 1.46	74.41 ± 3.78	58.26 ± 3.53	72.41 ± 3.19	55.74 ± 4.36	79.18 ± 5.73	59.48 ± 2.79	70.79 ± 3.83
t	0.478	6.610	0.129	4.879	0.375	14.735	0.073	6.350
P	0.633	0.000	0.879	0.000	0.708	0.000	0.941	0.000

4. Discussions

In clinical practice, appendicitis is caused by inflammatory reactions caused by obstruction of the appendiceal cavity by fecal stones, foreign bodies, or tumors, which seriously affects their physical and mental health. After the onset, patients mainly present with right lower abdominal pain, nausea, vomiting, loss of appetite, fever, etc. [7]. Appendicitis is an acute abdominal disease with an increasing prevalence and can be divided into acute appendicitis and chronic appendicitis. Acute appendicitis is often treated with surgery, which can remove the necrotic appendix and improve its condition. During the entire quality of life of appendicitis patients, standard laparotomy surgery can completely remove the patient's appendix. However, this surgery has certain disadvantages, such as large trauma and slow recovery, and cannot meet the modern treatment needs of patients. At the same time, when laparotomy is performed, patients have a higher risk of complications, which has a greater impact on clinical efficacy and improvement of prognosis. With the development of society and the continuous improvement of medical standards, laparoscopic appendectomy has been continuously improved and matured,

and is widely used in clinical practice. For patients with appendicitis, laparoscopic appendectomy is performed, and various surgical operations are carried out standardizedly with the assistance of laparoscopy. The surgical field of view is relatively clear, and the patient can return to health as soon as possible and obtain ideal therapeutic effects [8].

The study found that the treatment effect (95.56%/77.78%) showed an increasing trend in the observation group through statistical research, and the data comparison between the two groups was quite different, $P < 0.05$. In this study, by comparing the two surgeries, it was found that laparoscopic appendectomy has obvious advantages, especially in reducing trauma, promoting recovery, and reducing pain. Medical staff strictly carry out various operations, maintain the standardization and standardization of clinical treatment, and maximize clinical efficacy. During the actual treatment, the relevant medical staff strictly followed surgical standards, comprehensively explored the abdominal cavity, and accurately located the lesions to avoid misdiagnosis and missed diagnosis, which could comprehensively improve the patient's treatment level. Statistical research results showed that the incidence rate of complications (2.22%/15.56%) showed a decreasing trend in the observation group, and there was a large difference in the data between the two groups, $P < 0.05$. The reason: By comparing the two groups of different surgical treatments, laparoscopic appendectomy has a significant effect in reducing complications. During the treatment process, the medical staff maintained precise operations, reduced the incision and still carried out the operation smoothly. Not only did the operation accuracy improve, but it also caused less damage to the patient's surrounding tissue, which met the patient's surgical needs and thus reduced the risk of postoperative complications. At the same time, laparoscopic appendectomy can reduce postoperative pain in patients and help reduce the incidence of complications. Statistical research results of surgical indicators showed that the observation group showed a decreasing trend, and the data comparison between the two groups was quite different, $P < 0.05$. In this study, different surgical treatment methods were carried out to enter the abdominal cavity of appendicitis patients through small incisions, giving full play to its minimally invasive advantages, which can reduce intraoperative injuries and alleviate adverse factors for patients, and the patient's bleeding risk is significantly reduced. At the same time, the surgical field of view of this operation is clearer and larger than that of traditional surgery, allowing more accurate identification and treatment of blood vessels to avoid unnecessary bleeding. During laparoscopic surgery, medical staff use electrocoagulation to stop bleeding, which can effectively reduce the amount of bleeding. Since the incision of this surgery is relatively small, it will not cause major trauma to the patient, and the patient can move around as early as possible after the operation, which can significantly improve his mobility and exercise ability, which helps to improve his quality of life. In addition, this surgical method guides patients to actively cooperate with the surgery, significantly shortens their recovery time, and has a positive effect in reducing financial burden and psychological pressure. Statistical research results of inflammatory factor levels (TNF-α, IL-1β, IL-4) showed that the observation group showed a decreasing trend, and the data comparison between the two groups was quite different, $P < 0.05$.In this study, a comparison of the results of laparotomy and laparoscopic surgery showed that the latter was more advantageous in reducing inflammatory response. After the standardized operation, the patient's condition improved significantly and his stress response was reduced. At the same time, this operation reduces the release of inflammatory factors in patients with appendicitis, resulting in better overall condition, further improving the level of treatment. The medical staff performed the surgery in a standardized manner, were familiar with the contraindications and operating procedures of the surgery, and clarified the precautions. They gave full play to their surgical advantages and performed professional surgeries for the patients, which not only reduced tissue damage but also significantly reduced the patient's pain, greatly reducing the patient's physical and mental pain. Through this surgery, the patient's physiological stress level is subsequently reduced, thereby significantly reducing the level of inflammatory factors. The statistical research results of quality of life (QOL-100) showed that the observation group showed an increasing trend, and the data comparison between the two groups was quite different, $P < 0.05$. Analysis of reasons: When laparoscopic appendectomy is performed, medical staff perform various operations in a standardized manner and give full play to its minimally invasive advantages. Patients can return to normal activities within a short period of time after surgery, which helps improve their quality of life. During the treatment, the relevant medical staff displayed images from different angles through the monitor barrier to fully understand the patient's condition, strictly

performed aseptic operations, and actively prevented infection after surgery to avoid affecting the patient's recovery, further improving the level of treatment. During treatment, the following matters need to be noted: medical staff will take detailed medical history and physical examination, assess the patient's severity of appendicitis and comorbidities, and conduct necessary imaging examinations to confirm the diagnosis of appendicitis. At the same time, medical staff pay attention to the amount of gas injected into the abdominal cavity to avoid adverse events caused by excessive flatulence. In addition, medical staff can observe patients' vital signs after surgery and deal with abnormal phenomena in a timely manner, which will help to comprehensively improve the clinical efficacy.

5. Conclusion

To sum up, Laparoscopic appendectomy has the advantage of being minimally invasive, can reduce complications and reduce the level of inflammatory factors compared with open surgery, and can promote the improvement of the quality of life and is worth learning from.

About the author

Zhao Shengchang, male, Han nationality, born in Xuzhou City, Jiangsu Province in October 1978, undergraduate, community general practitioner, deputy chief physician, research direction: application and postoperative recovery of surgical operations such as gallbladder, tail rot, hernia, etc.

Disclosure statement

The author declares no conflict of interest.

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