

Observation on the Therapeutic Effect and Complication Rate of Totally Laparoscopic Total Gastrectomy and Laparoscopic-Assisted Total Gastrectomy in the Treatment of Gastric Cancer

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Abstract: Objective: To investigate the effect and complication rate of totally laparoscopic and laparoscopic-assisted total gastrectomy in the treatment of gastric cancer. **Methods:** From March 2019 to July 2021, 60 patients with gastric cancer were selected as the subjects in this study; the patients in group A underwent laparoscopic-assisted total gastrectomy, whereas those in group B underwent totally laparoscopic total gastrectomy; the treatment effect and complication rate were compared between the two groups. **Results:** The postoperative recovery of group B was significantly better than that of group A, and the postoperative complications (10.00%) of group B were significantly lower than that of group A (33.33%) ($P < 0.05$). **Conclusion:** For patients with gastric cancer, totally laparoscopic total gastrectomy has better therapeutic effect and lower postoperative complications, which is worthy of popularization.

Keywords: Totally laparoscopic total gastrectomy; Laparoscopic-assisted total gastrectomy; Gastric cancer; Therapeutic effect; Incidence of complications

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1. Introduction

Gastric cancer is a common malignant tumor of the digestive system. The mortality rate ranks second among malignant tumors, and the death toll in China is about 20 per 100,000 people. With the change of dietary pattern and increase in stress, the incidence rate and mortality rate of gastric cancer are gradually increasing, showing a younger trend, and the five-year survival rate is less than 30%. In clinical treatment, radical gastrectomy is the first choice. With the introduction of minimally invasive technology, there is a new trend for total gastrectomy, which does not only reduce the amount of intraoperative bleeding and the stress trauma caused by laparotomy, but also promote postoperative recovery^[1]. Sixty patients with gastric cancer were selected in this study to determine the effect of totally laparoscopic and laparoscopic-assisted total gastrectomy.

2. Materials and methods

2.1. Basic information

From March 2019 to July 2021, 60 patients with gastric cancer were divided into two groups, group A and group B, by the red and blue ball method, with 30 cases in each group. In total, there were 33 male patients

and 27 female patients; the mean age was 59.73 ± 3.26 years old; TNM stages included stage I (22 cases), stage II (19 cases), and stage III (19 cases). The data comparison was not significant ($P > 0.05$).

The indications of gastric cancer were met by imaging or fiber endoscopy; no surgical or chemotherapy contraindications, and no lesions were found in the heart, liver, and kidney.

2.2. Method

Patients in group A underwent laparoscopic-assisted total gastrectomy, and the procedure for each patient was as follows: laparoscopic-guided tissue dissociation and lymph node dissection; a 10 cm incision was made in the upper abdomen, and the specimens were taken out for gastrointestinal reconstruction and esophagojejunostomy; a drainage tube was placed in, and the incision was sutured.

Patients in group B underwent totally laparoscopic total gastrectomy, and the procedure for each patient was as follows: the patient was adjusted to supine position and intubated under general anesthesia; an incision was made at 1 cm below the umbilicus to create an artificial pneumoperitoneum, and a laparoscope was then placed to accurately explore and locate the lesion; the left and right anterior axillary edges were defined as traction holes and 5 mm trocars were placed in; the main operating hole was defined as the outer edge of the right rectus abdominis horizontal line and the junction at 2 cm above the navel. A 12 mm casing needle was inserted, and a 5 mm casing needle was then inserted into the left symmetrical position (traction hole) to form a V-shape. The greater omentum was freed and combined with ultrasonic knife resection, the clearing of lymph nodes were carried out according to the following sequence: from the right greater omentum, to the duodenal bulb, and the lower pole of the spleen; the pancreatic capsule and the anterior mesenteric lobe of colon were pulled; the common hepatic artery, left gastric artery, and proximal splenic artery were peeled back, and the left and right gastroepiploic vessels were removed; a 4.5 cm incision was made in the upper abdomen, and the specimens were taken out and sent for examination; the incision was closed and artificial pneumoperitoneum was established; with the help of linear cutting stapler, the suspensory ligament of the duodenum was transected, which was 7 cm (length 1 cm) from the distal jejunum stump; jejunum anastomosis and reconstruction of the digestive tract were carried out; a drainage tube was placed, and the incision was sutured ^[2,3].

2.3. Observation indicators

2.3.1. Perioperative indicators

The perioperative indicators included operation time, intraoperative bleeding, and the number of lymph nodes dissected.

2.3.2. Postoperative recovery indicators

The indicators for postoperative recovery included the time to postoperative flatulence, time taken to resume normal diet, time to postoperative ambulation, and hospitalization period.

2.3.3. Coagulation function indicators

A total of 2 ml fasting venous blood was taken from each patient before the procedure and 24 hours after that. The supernatant was taken by centrifugation. APTT (activated partial thromboplastin time), Fg (fibrinogen), and D-D (D-dimer) were measured by enzyme-linked immunosorbent assay ^[4].

2.3.4. Postoperative complications

Postoperative complications included anastomotic leakage, intestinal obstruction, infection, and fat

liquefaction.

2.4. Statistical analysis

Statistical Package for the Social Sciences (SPSS) 24.0 was used in this study. The measurement data were expressed in $\bar{x} \pm s$ and inspected by t , while the count data were expressed in percentage (%) and inspected by χ^2 ; $P < 0.05$ indicates a statistically significant difference.

3. Results

3.1. Perioperative indicators

The perioperative indicators were compared, and the values of each group were similar, with no significant difference ($P > 0.05$), as shown in **Table 1**.

Table 1. Perioperative indicators [$\bar{x} \pm s$]

Group	Operation time (min)	Intraoperative bleeding (ml)	Number of lymph nodes dissected
Group A (n = 30)	238.70 \pm 13.69	155.57 \pm 21.48	31.43 \pm 3.51
Group B (n = 30)	235.06 \pm 12.36	151.45 \pm 20.44	31.59 \pm 3.63
<i>t</i> value	1.0809	0.7611	0.1736
<i>P</i>	0.2842	0.4497	0.8628

3.2. Postoperative recovery

The postoperative recovery indicators were compared; the values of group A were significantly worse than those of group B ($P < 0.05$), as shown in **Table 2**.

Table 2. Postoperative recovery [$\bar{x} \pm s$, d]

Group	Time to first flatulence	Time taken to resume to normal diet	Time to postoperative ambulation	Hospitalization period
Group A (n = 30)	3.70 \pm 1.23	5.23 \pm 1.24	4.26 \pm 1.23	21.03 \pm 3.53
Group B (n = 30)	2.12 \pm 0.85	3.99 \pm 1.09	2.77 \pm 1.29	14.37 \pm 3.45
<i>t</i> value	5.7882	4.1138	4.5787	7.3904
<i>P</i>	0.0000	0.0001	0.0000	0.0000

3.3. Coagulation function

The coagulation profile of the patients in both groups were compared. The values of each group were similar, with no significant difference ($P > 0.05$), as shown in **Table 3**.

Table 3. Coagulation function indicators [$\bar{x} \pm s$]

Group	APTT (s)		Fg (g/L)		D-D (mg/L)	
	Preoperative	Postoperative	Preoperative	Postoperative	Preoperative	Postoperative
Group A (n = 30)	28.49 ± 5.74	29.87 ± 6.45	2.89 ± 0.60	3.59 ± 0.72	0.11 ± 0.01	0.30 ± 0.07
Group B (n = 30)	28.53 ± 5.71	30.14 ± 6.56	2.88 ± 0.62	3.66 ± 0.70	0.10 ± 0.03	0.32 ± 0.08
t value	0.0271	0.1607	0.0635	0.3818	1.7321	1.0305
P	0.9785	0.8729	0.9496	0.7040	0.0886	0.3070

3.4. Postoperative complications

The postoperative complications of the patients in both groups were compared. The values of group A (33.33%) were more than those of group B (10.00%), with significant difference ($P < 0.05$), as shown in **Table 4**.

Table 4. Postoperative complications [n, %]

Group	Anastomotic fistula	Intestinal obstruction	Infection	Fat liquefaction	Total incidence rate
Group A (n = 30)	4 (13.33)	3 (10.00)	2 (6.67)	1 (3.33)	10 (33.33)
Group B (n = 30)	1 (3.33)	1 (3.33)	1 (3.33)	0 (0.00)	3 (10.00)
χ^2					4.8118
P					0.0282

4. Discussion

Gastric cancer is a common type of gastrointestinal cancer, with high incidence rate and high mortality. Surgery is the first choice for patients with gastric cancer, in which the curative effect is better. Especially for patients with early gastric cancer, lesions can be removed, and the survival rate can be improved through surgery. Under the previous mode of treatment, open resection was common. Although cancer cells can be completely removed in this way, it has several disadvantages, such as large trauma and slow postoperative recovery. At the same time, surgical stress trauma will also increase the body's inflammatory response, block its immune regulatory function, and cause immune dysfunction, thus leading to the loss of resistance to cancer cells, which in turn accelerates metastasis and diffusion, resulting in a high rate of postoperative metastasis and life-threatening event [5].

Laparoscopy is a new type of minimally invasive surgery in recent years, and it is also the inevitable trend of surgical development in the future. With the vigorous development of industrial manufacturing technology, laparoscopy can be integrated with other disciplines combined with professional and skilled technical means and gradually acquire the status of traditional laparotomy. Especially in patients with gastric cancer, studies have shown that laparoscopic-assisted total gastrectomy can improve the effect of lymph node dissection and reduce postoperative complications, with a high safety profile [6].

In laparoscopic-assisted total gastrectomy, lymph nodes at the targeted area can be cleared under the guidance of laparoscopic technology and the incision made under the xiphoid process is convenient for gastric transection and gastrointestinal reconstruction. However, this procedure has its limitations, especially for the obese group. If the upper abdominal incision is small, it increases the difficulty of exposure, reduces the clarity of the surgical field, and induces postoperative complications due to excessive traction of the anastomosis. Totally laparoscopic total gastrectomy is also a kind of laparoscopic surgery for gastric cancer. It can be used to observe the tissue status of the lesion through laparoscopy, and then treatment such as lymph node dissection, tissue dissociation, and digestive tract reconstruction can be done.

The procedure will not lead to cell rupture and tissue damage while maneuvering the lesion. It has certain advantages, which include clear surgical field as well as less trauma and bleeding [7]. However, in the medical field, there are disputes about the efficacy of the two. This study showed that there is no significant difference in perioperative indicators and coagulation function indicators ($P > 0.05$), but the postoperative recovery and postoperative complications with totally laparoscopic total gastrectomy are significantly better than those of laparoscopic-assisted total gastrectomy ($P < 0.05$). The results showed that the former is more conducive to physical recovery, which is related to less trauma and less surgical stress response.

In short, in the treatment of patients with gastric cancer, totally laparoscopic and laparoscopic-assisted total gastrectomy both belong to the category of minimally invasive surgery. Compared with traditional laparotomy, they have the advantages of small incision and less trauma as well as bleeding. However, comparing the two in terms of curative effect, it can be appreciated that totally laparoscopic total gastrectomy has better postoperative recovery and lower incidence of postoperative complications; hence, this surgical method should be promoted.

Disclosure statement

The author declares that there is no conflict of interest.

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