

Observation of the Efficacy of Laparoscopic Resection of Anterior Rectal Cancer in Treating Rectal Cancer

Hao Zhang

Gucheng County Hospital of Hebei Province, Hengshui 253800, Hebei Province, China

Abstract: *Objective:* To analyze the efficacy of laparoscopic resection of anterior rectal cancer in treating rectal cancer. *Methods:* Fifty patients with rectal cancer who were treated in Gucheng County Hospital of Hebei Province from September 2017 to September 2019 were selected and recruited in the present study. These patients were divided into two groups, namely the control group and observation groups, by random number table method. Each group consisted of 25 patients. The control group underwent laparoscopic assisted transanorectal mesorectal excision, whereas the observation group underwent laparoscopic resection of anterior rectal cancer. The two groups were compared for related indicators, indicators pertaining to postoperative recovery, and complications. *Results:* There was no significant difference in the number of lymph node dissections between the two groups ($P>0.05$). The amount of intraoperative blood loss, surgical operation time, and incision length in the observation group were lower than those in the control group, and the differences were statistically significant ($P<0.05$). The time of getting out of bed, anal exhaust, and duration of hospital stay were shorter in the observation group than those of the control group, and the differences were statistically significant ($P<0.05$). In addition, the incidence of postoperative complications in the observation group was lower than that in the control group, and the differences were statistically significant ($P<0.05$). *Conclusions:* Laparoscopic resection of anterior rectal cancer is effective for rectal cancer patients. This treatment method can effectively reduce the amount of intraoperative bleeding, shorten the operation time, the time of anal exhaust, get out of bed, and the length of hospital stay, as well as improve condition of the patients.

Keywords: Rectal cancer; Laparoscopic resection of anterior rectal cancer; Complications

Publication date: July, 2019

Publication online: 10 July 2019

***Corresponding author:** Hao Zhang, zh18531877626@163.com

Patients with rectal cancer often have symptoms such as bloody stools, constipation, diarrhea, and edema in lower extremity, which negatively influence the patient's life and quality of life^[1]. At present, laparoscopic assisted transrectal mesorectal excision is often used in the treatment of rectal cancer patients, and it has proven to possess therapeutic effect. In recent years, laparoscopic resection of anterior rectal cancer has also been widely used in the treatment of rectal cancer, but the clinical effect of this type of surgical treatment remains controversial. In view of this, the present study aims to analyze the clinical effect of laparoscopic resection of anterior rectal cancer in patients with rectal cancer. The analysis is reported as follows.

1 Materials and methods

1.1 General information and baseline characteristics

Fifty patients with rectal cancer who were treated in Gucheng County Hospital of Hebei Province from September 2017 to September 2019 were selected and recruited in the present study. The recruited study participants were divided into two groups, namely the control group and observation group, by random number table method. Each group consisted of 25 patients. The control group consisted of 15 males and 10 females who were aged 47–73 years, with an average age of 60.18 ± 5.27 years. The body weight of the patients in control group was 45 – 86 kg, with

an average body weight of 65.74 ± 6.34 kg. In the observation group, there were 18 males and 7 females who were aged 45 – 73 years, with an average age 59.62 ± 5.19 years old. The body weight of the patients in observation group was 44 – 86 kg, with an average body weight of 65.23 ± 6.27 kg. The data of baseline characteristics between control group and observation group were compared using statistical analysis. The difference with $P > 0.05$ was not considered statistically significant.

1.2 Selection criteria

The inclusion criteria for selecting eligible study participants include: (1) the patients who meet the diagnostic criteria for rectal cancer in the “Criteria for the Diagnosis and Efficacy Evaluation of Clinical Diseases”^[2], (2) the patients with normal heart and lung functions, and (3) the patients with normal mental and cognitive functions. However, the patients were excluded from the current study if (1) they also have other malignant tumors; (2) they have coagulopathy, and (3) they have severe infectious diseases.

1.3 Methods

Patients in both control and observation groups were abstained from eating and drinking water for 8 hours and 6 hours before operation respectively. General anesthesia was performed by tracheal intubation and lithotomy position was used for the procedure.

1.3.1 Control group

The control group underwent laparoscopic assisted transanorectal mesorectal excision. An incision made was in the umbilicus, and a pneumoperitoneum was created. The pressure was set at 14 mmHg. A laparoscope with a diameter of 5 mm was inserted through the umbilical incision. The mesentery was exposed in two directions, and allowed to intersect at S₄-S₅. After the anal margin was lifted at 2 o'clock, 5 o'clock and 11 o'clock position, a rectal scope was inserted. A purse suture was performed at a distance of 2 cm from the distal end of the lesion tissue, and a circular incision from the distal end of the intestinal wall was made. The distal mesangium was exposed and excised. The peritoneum, blood vessels, and nerves were separated and lymph node dissection was performed. The mesenteric artery was ligated at 1.5 cm from the root. After severing the blood vessel, the sigmoid colon was cut (the proximal end of the lesion tissue was at 12 – 15 cm position), and a storage bag was used to collect the

lesion tissue. After being removed through the anus, the stump of the colon was closed, the sigmoid colon was put back into the abdominal cavity, and sigmoid colon-rectal anastomosis was then performed.

1.3.2 Observation group

The study participants of the observation group underwent laparoscopic resection of anterior rectal cancer. An incision was made in the umbilicus and a 10mm laparoscope was inserted as an observation hole. A puncture was performed at the Maison's point of the right lower abdomen as the main operation hole. A puncture was performed at the intersection of the umbilical horizontal line and the right midclavicular line. The operation hole is the intersection of the horizontal line of the umbilicus and the midline of the left clavicle, and the intersection of the midline of the left clavicle and the line of the anterior superior iliac crest. The abdominal cavity was explored. The sigmoid colon was ligated. After using the ultrasonic knife to dissect the mesentery, the small blood vessels were ultrasonically solidified and clipped, and the large blood vessels were cut. A linear cutter was used to cut the lower end of the rectum at 2 cm below the lesion tissue, and the freely cut rectal tissue was wrapped in a sterile bag and taken out through the assistant operation holes of the umbilical horizontal line and the left midclavicular line. After the sigmoid colon was cut off at the proximal end of the colon about 30 minutes later, the pouch was fixed and then returned to the abdominal cavity, and anastomosis was performed in the abdominal cavity.

1.4 Evaluation Index

(1)The intraoperative blood loss, operation time, number of lymph node dissections, and incision length were compared between the two groups. (2)The exhaust time, the time of getting out of bed and the length of hospital stay between the two groups were compared. (3)The incidence of wound infection, anastomotic fistula, and abdominal adhesion were also compared between the two groups.

1.5 Statistical analysis

Statistical Package for Social Sciences (SPSS), version 25.0 software was used to process and analyze the data. The quantitative data was expressed as $(x \pm s)$. Independent sample *t* test was used to compare the variables between control and observation groups.

Categorical variable data were expressed as percentage, and the Chi-squared (χ^2) test was used for comparison. A difference with $P < 0.05$ was considered statistically significant.

2 Results

2.1 Intraoperative indicators

There was no significant difference in the number of lymph node dissections between the control and observation groups ($P > 0.05$). The intraoperative blood loss, operation time, and incision length of the observation group were lower in observation group than those in the control group, and the differences were statistically significant ($P < 0.05$). The relevant results can be found in Table 1.

Table 1. Comparison of surgical related indicators between control and observation groups ($\bar{x} \pm s$)

Group	Intraoperative blood loss (ml)	Surgical operation time (min)	Lymph node dissection(n)	Length of incision(cm)
Control group (n = 25)	142.78±27.64	136.86±25.13	13.41±1.57	7.24±1.34
Observation group (n = 25)	126.79±26.72	122.47±24.78	14.27±1.68	6.17±0.79
t	2.080	2.039	1.870	3.439
P	0.043	0.047	0.068	0.001

2.2 Postoperative recovery effect

The duration of out-of-bed activity, time of anal exhaust, and length of hospital stay of the observation

group were shorter than those of the control group, and the differences were statistically significant ($P < 0.05$). The relevant results can be found in Table 2.

Table 2. Comparison of postoperative recovery effects between control and observation groups ($\bar{x} \pm s$, mmol/L)

Group	Time of anal exhaust	Duration of out-of-bed activity	Length of hospital stay
Control group (n = 25)	1.52±0.21	2.04±0.39	8.39±1.34
Observation group (n = 25)	1.39±0.19	1.38±0.25	7.14±1.23
χ^2	2.295	7.124	3.436
P	0.026	0.000	0.001

2.3 Postoperative complications

The incidence of postoperative complications in the observation group was lower than that in the control

group, and the difference was statistically significant ($P < 0.05$). The relevant results can be found in Table 3.

Table 2. Comparison of postoperative recovery effects between control and observation groups ($\bar{x} \pm s$, mmol/L)

Group	Wound infection	Anastomotic fistula	Abdominal adhesions	Total incidence
Control group (n = 25)	2(8.00)	1(4.00)	0(0.00)	3(12.00)
Observation group (n=25)	1(4.00)	0(0.00)	0(0.00)	1(4.00)
χ^2				0.272
P				0.602

3 Discussion

Surgical treatment is the main clinical treatment for rectal cancer patients. Although traditional laparotomy can effectively remove the lesion tissue, this treatment method is associated with several problems such as large wounds, susceptibility to infection, and prolonged

hospital stay, which not only affect the prognosis, but also increase the economic burden on patients, to some extent. Thus, the application of traditional laparotomy is associated with some limitations^[3-4]. Therefore, it is important to explore more efficient and safe treatments for patients.

Laparoscopic assisted transanal mesorectal excision

and laparoscopic resection of anterior rectal cancer are also widely used in the treatment of rectal cancer. Among them, laparoscopic assisted transanal total mesorectal excision can effectively remove the lesion tissue and lymph nodes. This operation can effectively reduce the number of abdominal incisions through the anus. However, this procedure can be affected by the anatomy of the basin, and the operating physicians who will perform the procedure must possess high technical level according to the strict requirements. In addition, studies have also shown that laparoscopic-assisted transanal mesorectal excision is likely to increase the risk for complications such as urinary system damage which might affect the prognosis^[5]. Compared with traditional laparotomy, laparoscopic resection of anterior rectal cancer is less traumatic to the abdominal wall. Therefore, this may effectively reduce the incidence of laparoscopic adhesion complications. In addition, the laparoscopic assisted transanal mesorectal resection can effectively avoid the risks of urinary system damage and infection. Laparoscopic resection of anterior rectal cancer has a relatively clear surgical field, which can effectively reduce the risk of damage to the surrounding organ tissues. The advantages of this surgical treatment include small surgical wound, easy recovery, effective reduction of intraoperative blood loss and hospital stay, as well as improvement of the disease condition^[6]. The results of this study showed that there was no significant difference in the number of lymph node dissections between the two groups, while the amount of bleeding, surgical operation time, and length of incision in the observation group were lower than those in the control group. Duration of out-of-bed activity, anal time of exhaust and the length of hospital stay were shorter in the observation group as compared with the control group. Apart from that, the incidence of postoperative complications of observation group was lower than that of the control group. This

indicates that laparoscopic resection of anterior rectal cancer is effective in treating rectal cancer, which can effectively reduce the amount of intraoperative bleeding. In addition, this surgical treatment can also shorten the surgical operation time on patients, time of anal exhaust, duration of out-of-bed activity and length of hospital stay, which may help improve the prognosis.

In summary, laparoscopic resection of anterior rectal cancer can reduce the amount of intraoperative bleeding in patients with rectal cancer, as well as shorten surgical operation time, time of anal exhaust, duration of out-of-bed activity and length of hospital stay, which is beneficial to the outcome of the disease.

References

- [1] Li RS, Hu B, Zhang F, et al. Efficacy of modified laparoscopic total mesorectal resection for the treatment of rectal cancer without auxiliary incisions [J]. Chinese Journal of Minimally Invasive Surgery, 2019, 19 (1): 46- 49.
- [2] Wang WW. Criteria for diagnosis and efficacy evaluation of clinical disease [M]. Beijing: Science and Technology Literature Press, 2010: 1402-1404.
- [3] Liu JJ, Duan LL, Yu KH. Comparative analysis of clinical efficacy and safety of laparoscopic total mesorectal excision and laparoscopic assisted transanal total mesorectal excision for the treatment of low and middle rectal cancer[J].Sichuan Medicine, 2018, 39(5): 563-566.
- [4] Li SX, Kang A. Comparison of the efficacy between laparoscopic rectal cancer with transanal total mesorectal excision and traditional laparoscopy [J]. Modern Digestion and Interventional Diagnosis and Treatment, 2018, 23(6): 782-785.
- [5] Li B, Pan XF, Zhang Q. Comparison of long-term efficacy and influencing factors between laparoscopic Dixon and Miles surgical operation in the treatment of stage III low rectal cancer [J]. Progress of Modern General Surgery in China, 2019, 22(2): 135 -137.
- [6] Xie ZY, Li ZH, Cheng LY, et al. Comparative study of laparoscopic and laparoscopic treatment of colorectal cancer on its surgical status, postoperative recovery, and recurrence and metastasis[J]. Modern Digestive and Interventional Diagnosis and Treatment, 2018, 23(3): 382-385.