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Clinical Value of Minimally Invasive Laparoscopic Treatment of Colorectal Cancer

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Abstract: To study the clinical value of minimally invasive laparoscopic treatment for colorectal cancer, and to analyze the clinical effect of minimally invasive laparoscopic treatment for colorectal cancer. According to our hospital in June 2019 to December 2019 were analyzed the clinical data of 124 patients with colorectal cancer contrast research, according to the operation method 124 patients were divided into control group and experimental group and control group including 62 cases of colorectal cancer patients, they all use conventional surgery treatment, the conventional surgery group; The experimental group included 62 patients with colorectal cancer, all of whom were treated with laparoscopic minimally invasive surgery, namely the laparoscopic minimally invasive treatment group. Age, sex, initial score at admission, grade of illness at admission, SAH Fisher grade at admission, intraoperative blood loss, operative time, postoperative hospital stay, complication rate, and tumor metastasis rate were observed in the two groups. In 62 patients data contrast analysis, two groups of patients in age, sex, when the initial score on admission, admission condition grading situation, SAH Fisher on admission grade five aspects: there is no difference ($P>0.05$), and how much the intraoperative blood loss, operating time length, length of postoperative hospital stay, complications, and two groups of patients with metastatic rate five aspects data showing a statistically significant difference ($P<0.05$). The minimally invasive laparoscopic treatment of colorectal cancer is significantly better than the conventional surgical treatment of colorectal cancer, the application of minimally invasive laparoscopic treatment of colorectal cancer patients can speed up the recovery of patients, reduce the incidence of complications.

1. Introduction

Colorectal cancer is a kind of colorectal cancer, is a common gastrointestinal cancer, the human

body is very harmful. Its fatality rate is second only to gastric cancer, esophageal cancer and liver cancer among the malignant tumors of the digestive system, which seriously threatens the life and health of patients. It occurs because of unhealthy living habits or environmental pollution in the patient's environment. Colorectal cancer patients will continue to grow, and in the process of tumor growth will gradually show some clinical symptoms (such as diarrhea, abdominal pain and other symptoms), and in the late stage of the body will show anemia, weight loss and other symptoms. At present, there are also a variety of treatment programs for colorectal cancer patients, but they are of weak clinical value. Therefore, it is necessary to improve the treatment programs for colorectal cancer patients, alleviate the pain and suffering of colorectal cancer patients, and contribute to the healthy development of human beings, so as to make continuous progress towards the strategy of healthy China.

There have been extensive studies on colorectal tumors, including not only the pathological study and analysis of colorectal tumors, but also the surgical treatment plan for colorectal tumors and the interfering treatment methods for the prognosis of colorectal cancer patients [1-2]. Foreign scholars mainly for colorectal tumor pathological study and analysis, the cause of cancer in colorectal cancer with adenocarcinoma of the morphological characteristics of pathological changes, only in the mucous membrane layer belongs to high-grade intraepithelial neoplasia, and most of the early colorectal cancer patients can be cured, and life period in 5 years survival rate reached 95%, but patients with advanced colorectal cancer can continue to live five years the probability of less than 10% [3-4]. Domestic scholars mainly aims at the surgical treatment of colorectal cancer research as well as the interference of the prognosis of patients with colorectal cancer treatment, endoscopic think at this stage in colorectal cancer patients are more widely applied in the operation, also can achieve a certain therapeutic effect, and they believe in patients with colorectal surgery combined with a variety of before and after treatment in comprehensive treatment will be better than only use effect of the surgical treatment, such as the use of chemotherapy and targeted therapy and other ways to do a good job of body function recovery postoperatively [5-6]. Endoscopy can be divided into soft and hard scopes, of which laparoscopy is one of the hard scopes. However, there have been few studies on the application of laparoscopy in colorectal cancer patients, and few scholars have paid attention to the clinical value of minimally invasive laparoscopic treatment of colorectal cancer, let alone carried out relevant studies [7]. Therefore, on the basis of research at home and abroad, the study of this paper has a certain practical significance and feasibility.

In this paper, based on the existing research, the clinical data of patients with colorectal cancer treated with conventional surgery and minimally invasive laparoscopic surgery were compared and analyzed. Mainly according to our hospital between January 2019 and December 2019, 124 cases of colorectal cancer patients in our hospital clinical data comparative analysis, according to the operation method 124 patients were divided into control group and experimental group and control group and experimental group including 62 cases of colorectal cancer patients, the patients in the control group adopts the conventional surgery treatment, the conventional surgery group; All patients in the experimental group were treated with laparoscopic minimally invasive surgery, namely, the laparoscopic minimally invasive treatment group. After the clinical data of colorectal cancer patients, mainly observed two groups of patient's age, sex, when the initial score on admission, admission condition grading situation, SAH Fisher grade on admission, intraoperative blood loss, operating time length, length of postoperative hospital stay, complications, and tumor metastasis rate, and use the data analysis software analysis whether two groups of patients in these areas have significant differences. Finally, according to the differences, whether minimally invasive laparoscopic treatment of colorectal cancer has more obvious clinical value.

2. Theoretical Basis

2.1. Necessity of Laparoscopic Application

As an instrument with a miniature camera, laparoscopy is a minimally invasive surgical method, which has appeared in various surgical procedures and is also a development trend of surgical methods in the future [8]. Laparoscopic surgery is the process of using laparoscopy and various related instruments to perform surgery on patients [9]. First is in the case of certain lighting, insert the laparoscopic lens by means of the abdominal cavity, after the use of laparoscopic captured images will display in real time on the special monitor, then the doctor according to the monitor in the images of organs in patients with different angles for the patient to make analysis and judgment, according to the analysis results using the special equipment to patients with colorectal cancer surgery [10-11].

Colorectal cancer surgery has a high risk, not only because colorectal cancer patients are mostly middle-aged and elderly, but also because colorectal cancer surgery itself has a certain risk [12]. First of all, the elderly are often accompanied by a variety of basic diseases, such as cardiovascular diseases (including hypertension, coronary heart disease, heart beat too slow, etc.), respiratory diseases (including pulmonary heart disease, bronchitis, etc.) and diabetes, etc. Second, the elderly in basic end-stage colorectal cancer surgery, in this case, the patient may be a long period of time is in a state of not eating properly, so that the patient's physical condition is relatively poor, may lead to lower tolerance of surgery and postoperative complications in patients with a greater incidence of; At the same time in the process of colorectal tumor surgery also can appear some unexpected circumstances, such as a doctor. According to the monitor organs in patients with different angles on the side of the image to the patient make analysis and judgment and use of equipment during surgery, pull the over-consumption of tissue would happen, can cause tumors had colorectal tissue to be squeezed, even that destroy suitable operation environment of the body; Finally, if a settlement of rectal tumor rupture during the operation process to the doctor's surgery formed certain interference, this requires surgery doctors in the case of a tumor destruction must first keep calm, not blind separation of tumor neck, avoid caused by bleeding not clear operation field, blind operation and damage the blood vessel of colorectal tissue and related organizations.

Therefore, it is necessary to find a more effective surgical assistant tool. With the continuous development of medical technology, the scope of the application in laparoscopic colorectal tumor patients, gradually appeared the laparoscopic minimally invasive surgery, namely in the minimally invasive surgery, laparoscopic can be used to help doctors observed images of patients suffering from tumor site, it can provide doctors with more detailed operation path positioning, also can relieve the pain in the routine surgery for patients. Then laparoscopic minimally invasive treatment of colorectal cancer is very necessary, and is also required by the continuous progress of technology.

2.2. Application Advantages of Laparoscopy

Laparoscopic surgery with two holes, three holes and 4 holes surgery operation, which is basically a hole open belly button on the human body, this is mainly to avoid surgery in patients with abdominal scars left not good-looking long strips, the patients' recovery after surgery, the surgery is also leaves only one to three in the abdominal area of no more than a centimeter of linear scars, recovery will largely disappeared after good enough that the existence of invisible scar.

The advantages of two-hole laparoscopic surgery are particularly significant in two-hole,

three-hole, and four-hole operations. First of all, the surgical trauma is very small, only two small mouth, resulting in a small scar; Second, in the process of surgery knife is directly into, abdominal visceral organs to disrupt the relatively small, is not very serious damage of colorectal tissues around, at the same time in the operation process to avoid the air and dust in the air bacteria to stimulate and pollution of the abdominal cavity, so that the colorectal and surrounding tissues in the risk of postoperative adhesion decreases; Thirdly, the postoperative wound pain of patients will also be significantly relieved due to the minor surgical trauma; Fourth, under laparoscopic minimally invasive surgery in colorectal cancer patients less hospitalization days, generally only need two or three days, recovery in patients with good can completely restored to health after a week, on the one hand can make the patients no longer worries about the hospitalization expenses, on the other hand also can improve the utilization of hospital beds and turnover, is one of the most important aspects can improve the cure rate of patients with colorectal cancer.

But in the use of laparoscopic colorectal tumor minimally invasive surgery, we should also avoid of laparoscopy in symptoms may occur, such as carbon dioxide pneumoperitoneum, vascular injury, visceral injury and complications of abdominal complications, and so on, mainly carbon dioxide pneumoperitoneum complications included pneumothorax, air embolism, hypercapnia and acidosis, pericardial pneumatosis, lower limb venous blood stasis, and a variety of complications such as thrombosis cause hypothermia and blood vessel damage is mainly due to the doctors at the time of surgery violence after piercing damage peritoneal large blood vessels, Visceral injury is mainly caused to the internal organs near the colorectal tissues during the operation, while abdominal wall complications are mainly related to pore-punching during the operation, such as pore-punching infection and pore-punching hernia. Therefore, in the application of laparoscopy, we should pay attention to the possible complications involved in laparoscopy and their causes, and prepare for the sudden occurrence of these complications during the operation as well as corresponding countermeasures.

3. Treatment Plan

(1) Routine surgical treatment

Conventional surgical treatment in colorectal cancer patients mainly adopts open way cutting and removal of colorectal cancer, the surgery way too much trauma, postoperative hospitalization for a long time, postoperative recovery time is longer, and the high incidence of postoperative complications, do not use in colorectal cancer patients health, therefore this way of surgical treatment has been out of the way choice of colorectal cancer treatment.

(2) Minimally invasive laparoscopic treatment

Compared with conventional surgery for colorectal cancer patients treated by laparotomy, laparoscopic minimally invasive colorectal cancer surgery is performed to cut and remove tumors by means of laparoscopically transmitted multi-dimensional images of the colorectal tumor location, which has the advantages of less surgical trauma, shorter postoperative hospital stay, and shorter postoperative recovery time. In addition, if the colorectal tumor is too large or too numerous, laparoscopic minimally invasive surgery should be considered carefully.

(3) Comparison of minimally invasive laparoscopic treatment and conventional surgical treatment

This paper mainly compares the safety and efficacy of minimally invasive laparoscopic treatment with conventional surgical treatment. First of all, in terms of safety, laparoscopic minimally invasive treatment of colorectal cancer has the characteristics of fewer traumas, less surgical risk

and lower incidence of complications, and the safety is significantly higher than that of conventional surgery for colorectal cancer patients. Secondly, in terms of efficacy, this study through to the laparoscopic minimally invasive treatment and conventional surgery has carried on the contrast analysis, the results show that using laparoscopy minimally invasive treatment, patients with intraoperative blood loss, operating time length, length of postoperative hospital stay, complications, and tumor metastasis rate five aspects were superior significantly superior to the conventional surgery for treatment of colorectal cancer patients.

4. Research Methods and Process

4.1. Research Methods

(1) Comparative study method

When it is usually necessary to analyze the different impact indicators of the same kind of things, we will adopt the comparative study method, that is, the comparative study method refers to the relevant investigation of two kinds of related things to find out the rules of the development and evolution of things. In the research of this paper is mainly to our hospital between January 2019 and December 2019, 124 cases of colorectal cancer patients in our hospital clinical data were analyzed, according to the operation method 124 patients were divided into control group and experimental group, control group and experimental group including 62 cases of colorectal cancer patients, the patients in the control group adopts the conventional surgery treatment, the conventional surgery group; All patients in the experimental group were treated with laparoscopic minimally invasive surgery, namely, the laparoscopic minimally invasive treatment group. After the clinical data of colorectal cancer patients, main is to observe and record two groups of patient's age, sex, when the initial score on admission, admission condition grading situation, SAH Fisher grade on admission, intraoperative blood loss, operating time length, length of postoperative hospital stay, complications, and tumor metastasis rate.

(2) Data analysis

In this paper, data analysis is mainly used to analyze the data records of the comparative study, and SPSS is used to carry out t-test and chi-square test of the recorded data. In contrast research, analysis of the two groups of patients age, sex, when the initial score on admission, admission condition grading situation, SAH Fisher grade on admission, intraoperative blood loss, operating time length, length of postoperative hospital stay, complication rates, and the differences of tumor metastasis rate is significant, the initial grading of age, on admission, admission condition when grading situation, SAH Fisher grade on admission, intraoperative blood loss, operating time length, length of postoperative hospital stay, complications, and tumor metastasis rate of T test, Chi-square test was performed for gender of patients. According to the test results, the efficacy of minimally invasive laparoscopic treatment of colorectal cancer is significantly better than that of conventional surgery. Among them, if the conventional surgery group and the laparoscopic minimally invasive surgery treatment group patients in the intraoperative blood loss, operating time length, length of postoperative hospital stay, complications, and tumor metastasis rate five aspects are different ($P < 0.05$), then you can to a certain extent, shows the effect of laparoscopic minimally invasive treatment of colorectal cancer is superior to conventional surgery for the treatment of colorectal cancer.

4.2. Research Process

This study selected and analyzed the clinical data of 124 patients with colorectal cancer admitted to our hospital from January 2019 to December 2019. This time range was selected because it was in line with the current treatment status of patients with colorectal cancer, and to some extent guaranteed the authenticity of the data and the reliability of the study.

First of all, determine the comparative study of the experimental group and control group, which controls the conventional surgery group (including 62 cases of patients treated by conventional surgery for colorectal cancer), the experimental group the laparoscopic minimally invasive surgery treatment group (including 62 cases through the laparoscopic minimally invasive surgery for colorectal cancer patients data). Among them, variables were different surgical methods (namely conventional surgery and laparoscopic minimally invasive surgery), while other factors remained unchanged except variables.

Secondly, the index of this paper is determined. In other words, the age, gender, initial score on admission, condition grading on admission, SAH Fisher grading on admission, intraoperative blood loss, duration of operation, length of postoperative stay, incidence of complications and tumor metastasis rate of the two groups were observed, and these conditions were recorded.

Thirdly, SPSS was used to analyze the clinical data of the patients. Using T test analysis of patient's age, initial score on admission, on admission condition grading situation, SAH Fisher grade on admission, intraoperative blood loss, operating time length, length of postoperative hospital stay, complications, and tumor metastasis rate, using the chi-square test the patient's gender, and record the SPSS analysis results.

Finally, correlation analysis was conducted according to the results obtained by SPSS. If conventional surgery group and the laparoscopic minimally invasive surgery treatment group patients in the intraoperative blood loss, operating time length, length of postoperative hospital stay, complications, and tumor metastasis rate five aspects are different ($P<0.05$), then you can to a certain extent, shows the effect of laparoscopic minimally invasive treatment of colorectal cancer is superior to conventional surgery for the treatment of colorectal cancer; If there is no difference (i.e., $P>0.05$), it indicates that the minimally invasive laparoscopic treatment of colorectal tumors is not superior to the conventional surgical treatment of colorectal tumors.

5. Results and Discussions

In this section the main data of two groups of patients age, sex, when the initial score on admission, admission condition grading situation, SAH Fisher grade on admission, intraoperative blood loss, operating time length, length of postoperative hospital stay, complications, and a comparative study of tumor metastasis rate to conventional surgery group marked as CST, laparoscopic minimally invasive surgery group notes for LST.

(1) Comparison of age and gender information between CST group and LST group

The basic information of patients in the CST group and the LST group was compared and analyzed, mainly the gender and age of the patients. The results are shown in Table 1 below. As can be seen from Table 1, there was no significant difference in gender and age between the conventional surgery treatment group and the laparoscopic minimally invasive surgery treatment group, that is, $T=0.235$ and $P=0.659>0.05$ in the t-test of age information, indicating that there was no statistically significant difference in age between the two groups. In the Chi-square test of gender information, Pearson$\chi^2=0.435$, $P=0.956>0.05$, indicating that there was no statistical significance

in the gender difference between the two groups. In summary, the age and sex of the patients had no effect on the results of this comparative study.

Table 1. Comparison of age and gender information between CST group and LST group

Group	Age	Sex（Num and Percentage）			
		Men		Women	
CST group	33.5-48.2	30	48.4%	32	51.6%
LST group	34.9-47.6	28	45.1%	34	54.8%

(2) Initial score on admission of patients in CST group and LST group

The two groups were then compared in terms of their initial scores on admission, and the detailed data were shown in Figure 1. The initial score of the patient at admission is 5-7, 8-10 and 11-13. The higher the score, the better the patient's physical condition at admission. As can be seen from Figure 1, the number of patients with scores of 8-10 and 11-13 in the CST group was higher than that of patients with scores of 8-10 and 11-13 in the LST group, while the number of patients with scores of 5-7 in the CST group was lower than that of patients with scores of 5-7 in the LST group. In the T-test of the two groups of data, T =0.598, P=0.564>0.05, that is, there was no significant difference in the initial score on admission between the conventional surgery treatment group and the laparoscopic minimally invasive surgery treatment group, which did not affect the results of this comparative study.

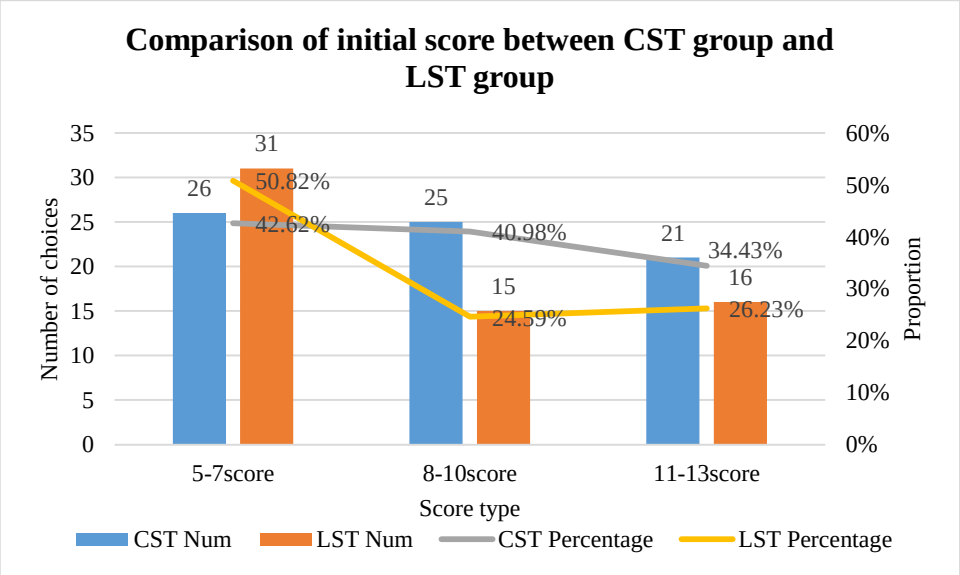

Figure 1. Comparison of the initial score at admission between the CST group and the LST group

(3) Grade of CST group and LST group at admission

Then, the condition grades of the two groups of patients at admission were compared, and the detailed data were shown in Figure 2. On admission patient classification is mainly divided into I, II, III, IV, the higher the series on behalf of the patient's condition is more serious. We can see in figure 2 CST group on admission patient III level more than the number of LST group on admission patient III level, the number of CST group of patients on admission condition for I, II fewer than in LST group of patients on admission condition for the number of levels I, II, CST group on admission patient IV level is equal to the number of LST group on admission patient IV level. In

the t-test of the two groups of data, T=0.698, P=0.578>0.05, that is, there is no significant difference between the conventional surgery treatment group and the laparoscopic minimally invasive surgery treatment group in terms of the grade of disease at admission, which does not affect the results of this comparative study.

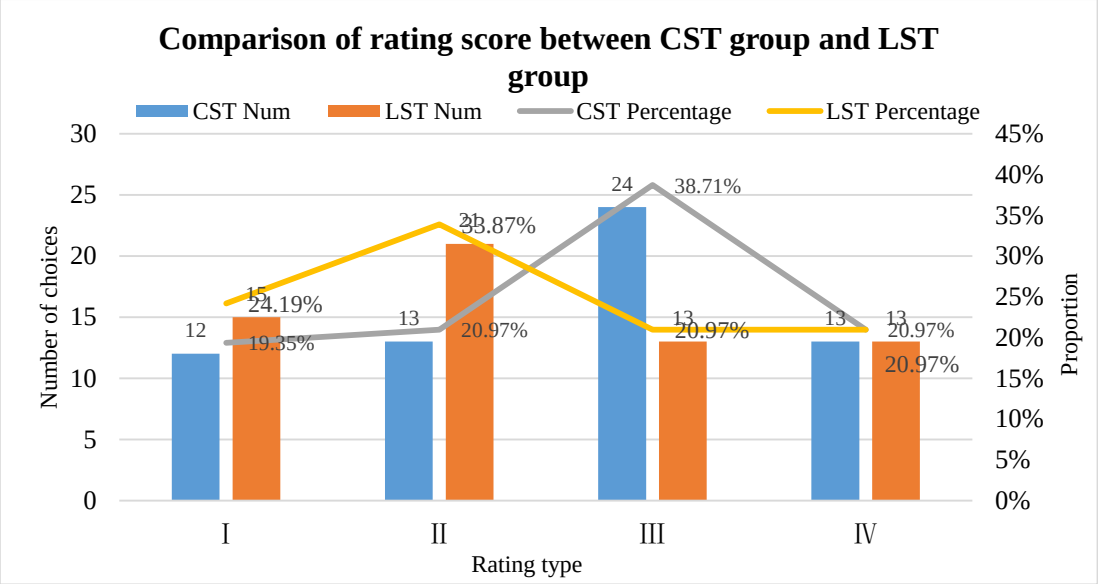

Figure 2. Comparison of the grade of CST group and LST group at admission

(4) SAH Fisher classification at admission in CST group and LST group

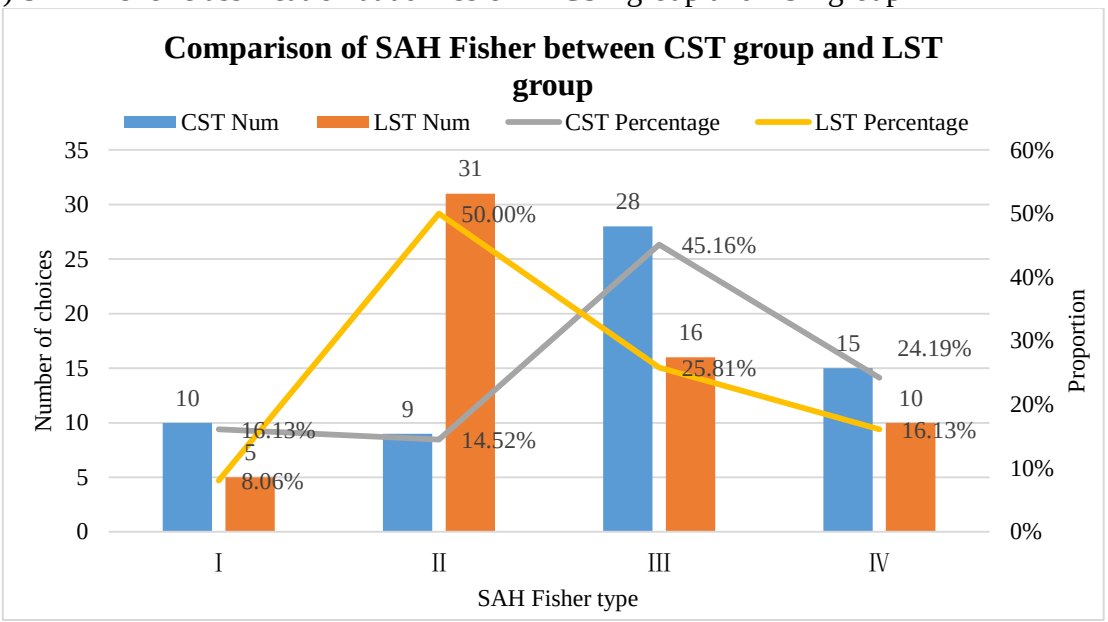

Figure 3. Comparison of SAH Fisher classification at admission between CST group and LST group

The SAH Fisher classification at admission was then compared between the two groups, with detailed data as shown in Figure 3. On admission in patients with SAH Fisher class mainly divided into I, II, III, IV, the higher the series on behalf of the patient's condition is more serious. In Figure

3 we see CST group of patients condition for I grade on admission, the number of levels III and IV than LST group of patients condition for I grade on admission, the number of levels III and IV, CST group on admission patient II level less than the number of LST group on admission patient II level. In the T-test of the two groups of data, T=0.789, P=0.231>0.05, that is, there was no significant difference in SAH Fisher classification at admission between the conventional surgical treatment group and the laparoscopic minimally invasive surgery treatment group, which did not affect the results of this comparative study.

(5) Comparison of intraoperative blood loss between CST group and LST group

Then, intraoperative blood loss was compared between the CST group and the LST group, and the results were shown in Table 2. It can be seen in Table 2 that intraoperative blood loss of patients in CST group was higher than that of patients in LST group. In the T-test of the two groups of data, T=0.203, P=0.02<0.05, that is, there is a significant difference in intraoperative blood loss between the conventional surgery treatment group and the laparoscopic minimally invasive surgery treatment group.

Table 2. Comparison of intraoperative blood loss between CST group and LST group

Group	Case number	Intraoperative blood loss(ml)
CST Group	62	39.53-50.36
LST Group	62	25.98-36.45

(6) Comparison of operative time and postoperative hospital stay between CST group and LST group

Then, the operative time and postoperative hospital stay of the two groups were compared, and the detailed data were shown in Figure 4. As can be seen from Figure 4, the number of patients in the CST group with longer operation time and longer postoperative hospital stay was higher than that in the LST group, and the number of patients in the CST group with shorter operation time and postoperative hospital stay was lower than that in the LST group. In the T-test of the two groups of data, T =0.102, P=0.002<0.05, that is, there were significant differences between the conventional surgery treatment group and the laparoscopic minimally invasive surgery treatment group in terms of operation time and postoperative hospital stay.

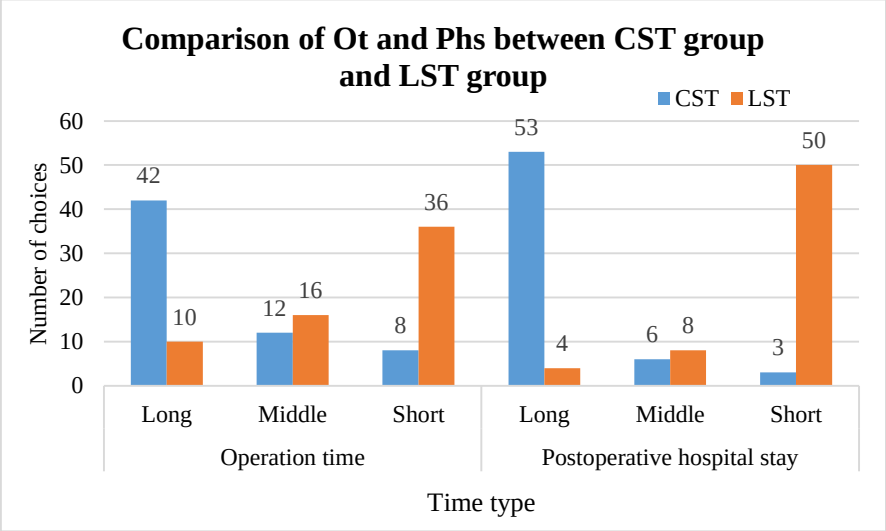

Figure 4. Comparison of operative time and postoperative hospital stay between CST group and LST group

(7) Comparison of complication rate between CST group and LST group

The complication rates of CST group and LST group were then compared, and the results were shown in Table 3. It can be seen from Table 3 that the complication rate of CST group is higher than that of LST group. In the T-test of the two groups of data, T =0.145, P=0.01<0.05, that is, there is a significant difference in the incidence of complications between the conventional surgery treatment group and the laparoscopic minimally invasive surgery treatment group.

Table 3. Comparison of complication rates between CST group and LST group

Group	Case number	Complication rate
CST Group	62	45.9%-56.8%
LST Group	62	23.5%-32.1%

(8) Comparison of tumor metastasis rate between CST group and LST group

Then, the tumor metastasis rate of patients in the CST group and the LST group was compared, and the results were shown in Table 4. It can be seen from Table 4 that the tumor metastasis rate of patients in the CST group is higher than that of patients in the LST group. In the T-test of the two groups of data, T =0.126, P=0.03<0.05, that is, there is a significant difference in tumor metastasis rate between the conventional surgery treatment group and the laparoscopic minimally invasive surgery treatment group.

Table 4. Comparison of tumor metastasis rate between CST group and LST group

Group	Case number	Tumor metastasis rate
CST Group	62	49.6%-65.3%
LST Group	62	12.5%-21.3%

To sum up, there were no significant differences in age, gender, initial score at admission, condition grading at admission, and SAH Fisher grading at admission between the two groups (P>0.05), indicating that these aspects did not affect the comparative study results in this paper. In intraoperative blood loss, operating time length, length of postoperative hospital stay, complications, and tumor metastasis rate five aspects are different (P<0.05), then you can to a certain extent, shows the effect of laparoscopic minimally invasive treatment of colorectal cancer is superior to conventional surgery for the treatment of colorectal cancer, application of laparoscopic minimally invasive treatment in patients with colorectal cancer can accelerate the recovery of the patients, reduce the incidence of complications.

6. Conclusion

With the continuous development of medical technology, a variety of endoscopic application in tumor surgery and cancer surgery, including laparoscopic, applications has been deep, but the application of laparoscopy in colorectal tumors are relatively rare, academic research on this field is also relatively shallow, in this paper, the research to a certain extent, enrich the research in the field of the defects and deficiencies. In this article, through comparative study proved that the conventional surgery group and the laparoscopic minimally invasive surgery treatment group patients in the intraoperative blood loss, operative time, postoperative hospital stay, complications, and tumor metastasis rate had significant differences in five aspects, namely the laparoscopic minimally invasive treatment of colorectal cancer has significant clinical value, and the effect of laparoscopic minimally invasive treatment of colorectal cancer is superior to conventional surgery for the treatment of colorectal cancer, patients can effectively reduce the postoperative recovery

time, and can effectively reduce the incidence of complications. Laparoscopic minimally invasive surgery was applied to the treatment of patients with colorectal cancer, compared to traditional open surgery, the postoperative effect is better, shorter operation time, intraoperative blood loss, less tumor metastasis rate is low, to a certain extent, improve the patients recovery rate, therefore, laparoscopic minimally invasive surgery way worthy of clinical application in patients with colorectal cancer surgery. The conclusions of this study are expected to provide a feasible treatment plan for colorectal cancer patients, hoping to relieve the suffering of middle-aged and elderly patients with colorectal cancer, and at the same time contribute to the strategy of healthy China.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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