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# COMPARATIVE EVALUATION OF THE RESULTS OF APPLYING THE BASIC METHODS OF SURGICAL TREATMENT FOR COLORECTAL CANCER.

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**Abstract:**
In this study, the authors presented an assessment of the comparative effectiveness of laparoscopic surgery and open surgery in the treatment of colorectal cancer. 92 patients with histologically verified colorectal cancer were included in this study. By randomization, patients were divided into a control group (open surgery, n = 46 cases) and a study group (laparoscopic surgery, n = 46 cases). The duration of the operation (122.54 ± 14.85) min and the length of the incision (4.51 ± 1.065) cm were shorter in the study group compared to the control group. Intraoperative blood loss in the main group was (161.12 ± 10.694) ml, versus the control group (218.53 ± 15.369) ml ($p<0.05$). Patients in the main group had a higher five-year survival rate and a lower incidence of postoperative complications compared to the control group (all $P < 0.05$). Therefore, the use of laparoscopic surgery in the treatment of colorectal cancer has better clinical effect than open surgery and is worthy of clinical application.

**Keywords:** Laparoscopic surgery; open surgery; colorectal cancer

## INTRODUCTION.

Colorectal cancer is one of the most common malignant tumors in all economically developed countries of the world, ranking third in the structure of cancer incidence and fourth in mortality [1-5]. It can affect the cecum, ascending, transverse colon, descending, sigmoid, rectum and other parts of the gastrointestinal tract [6]. Ki-67 positivity and its positive value are an expression of oncogene expression and the basis of the malignant biological behavior and histopathological changes of colorectal cancer. Surgical treatment is an effective method of inhibiting the disease in patients. Different surgical methods affect tumorigenesis and patient prognosis in different ways. Colorectal cancer is a malignant tumor that is frequently encountered in clinical practice. Patients with early colorectal cancer experience only clinical symptoms such as bloating and dyspepsia, which rarely cause patients to pay attention to them. As a result, most patients seek hospital treatment and their condition progresses to an advanced stage, which poses a serious threat to the patient's life.

Despite advances in drug and radiation therapy, surgery remains the most effective treatment for colorectal cancer. In recent years, laparotomy has been mainly used to treat colorectal cancer, but this treatment method is more traumatic for the patient [7-9].

Patients in the postoperative period experience multiple complications, and the prognosis is not always satisfactory [10-12]. Therefore, active exploration of alternative treatments for colorectal cancer has become the focus of clinical research [13–15].

In recent years, with the continuous development of minimally invasive techniques, laparoscopic surgery has been widely used in clinical treatment due to its less surgical trauma, negligible bleeding and rapid recovery of postoperative patients [8,16,17].

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The use of modern minimally invasive technologies in surgery has made it possible to increase the efficiency of surgical treatment of patients with colorectal cancer, on the one hand, by minimizing surgical trauma, and on the other hand, through early rehabilitation of patients, which led to the creation of a multimodal early recovery program or the so-called "accelerated rehabilitation" patients" after operations. The ideologist of this method was the Danish anesthesiologist-resuscitator Professor Henrik Kehlet. He was the first to propose the use of an accelerated rehabilitation protocol for patients and conducted a systematic analysis of the pathophysiological mechanisms of complications after planned surgical interventions [19]. It was a comprehensive program that included both preoperative preparation, surgery, and postoperative patient management. However, the clinical effect of laparoscopic surgery in the treatment of colorectal cancer is still controversial [21,22]. In our study, we analyzed the clinical effectiveness of open surgery and laparoscopic surgery for colorectal cancer, and also conducted a comparative analysis of the long-term results of both methods of surgical treatment of colorectal cancer.

**PURPOSE -** To compare the clinical effectiveness of laparoscopic surgery and open surgery for colorectal cancer by analyzing long-term treatment results.

## MATERIALS AND METHODS.

This study includes the results of treatment of 92 patients with histologically verified colorectal cancer admitted to the department of endovisual oncosurgery of the Republican Specialized Scientific and Practical Medical Center of Oncology and Radiology for the period from 2015 to 2021. Patients were divided into a control group (open surgery, n = 46 cases) and a study group (laparoscopic surgery, n = 46 cases). The study was approved by the center's ethics committee.

Inclusion criteria:

- Age: 18 years - up to 75 years
- Histologically verified adenocarcinoma of the rectum and colon cT1-T3, T4a N0-2, M0
- No distant metastases
- Absence of primary multiple malignant tumors
- ECOG status: 2 or lower
- ASA I, II, III

Exclusion criteria:

- Age under 18 and over 75 years old
- Nonepithelial forms of tumors, neuroendocrine cancer of the colon and rectum
- Presence of synchronous colon tumors
- Complicated course of the disease
- Distant metastases
- Pregnancy and lactation
- ASA status IV or higher
- HIV infection
- Presence of mental illness
- An established diagnosis of diffuse familial polyposis or Lynch syndrome.

Patients in the control group underwent open surgery. Patients in the main group underwent laparoscopic treatment. The specific procedure is as follows. An artificial pneumoperitoneum was first established, and the pneumoperitoneum pressure was maintained at approximately 12 mmHg. (1 mm Hg = 0.133 kPa). Laparoscopy and instrumentation were performed using the 5-hole method; tumors were observed using laparoscopy to determine tumor location. Then, using an operating instrument, the blood vessels around the tumor were clamped and cut, the tumor was removed (when removing the tumor, attention was paid to the integrity of the colon and mesorectum), and the surrounding regional lymph nodes were cleaned. The abdominal area was irrigated and a chest tube was placed for drainage; in the absence of bleeding, the abdominal cavity was closed in layers. Open surgery and laparoscopic surgery were used to compare and monitor clinical efficacy, Ki-67 expression obtained after surgery, as well as complications and 5-year survival.

Comparative analysis was carried out using various methods of statistical analysis: Student's t-test, Mann-Whitney U-test, $\chi 2$ test. The level of statistically significant results was considered $p < 0.05$. Statistical data processing was carried out using StatPlus and IBM SPSS statistical programs.

## RESULTS:

The average age of patients in the main group was (56.71 ± 4.33) years, and the average age of patients in the control group was (56.04 ± 3.59) years. There was no statistically significant difference between the two groups ($t = 0.803$, $P = 0.424$). In the main group there were 40 (86.96%) patients under the age of 60 years. In the control group there were 38 (82.61%) patients whose age was under 60 years. There were 31 (67.39%) men in the main group, and 33 (71.74%) men in the control group. There were no significant differences in age and gender between the main and control groups ($p>0.05$) (Table 1).

**Table 1**
**Comparison of general patient characteristics**

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| **Options** | **Main group (n = 46)** | | **Control group (n= 46)** | | **P** |
|---|---|---|---|---|---|
| | **n** | **%** | **n** | **%** | |
| Age group (years) | | | | | 0,424 |
| <60 | 40 | 86,96 | 38 | 82,61 | 0,562 |
| >60 | 6 | 13.04 | 8 | 17,39 | |
| Sex | | | | | |
| Male | 31 | 67,39 | 33 | 71,74 | 0,65 |
| Female | 15 | 32,61 | 13 | 28,26 | |

The average duration (Mean ± SD) of the operation was 122.54 ± 14.85 minutes in the main group and 151.60 ± 19.81 minutes in the control group, respectively. The difference between the two groups was statistically significant (p<0.05). The average intraoperative blood loss was 161.12 ± 10.694 ml in the main group and 218.53 ± 15.369 ml in the control group. The difference between the two groups was statistically significant (t=-20.798, p<0.05). The average incision length in the main group was 4.51 ± 1.065 cm, and the average incision length in the control group was (13.14 ± 2.327) cm. The difference between the two groups was statistically significant (t = -22.891, p<0.05) . In the main group, 4 (8.69%) cases of complications were identified (incisional infection, pulmonary infection, bleeding from the anastomosis and intestinal obstruction in 1 case). In the control group, 4 cases of wound infection and 2 cases of pulmonary infection were registered. There were 3 cases of bleeding from anastomoses, 2 cases of intestinal obstruction and 1 case of thrombosis of the veins of the lower extremities (26.08%). The difference between the two groups was statistically significant (p<0.05).

In the main group, 30 (65.22%) patients survived 5 years after surgery versus 11 (23.91%) cases in the control group. The difference between the two groups was statistically significant (p<0.05).

In the main group, 21 (45.65%) cases of positive Ki-67 expression after surgery were recorded versus 41 (89.13%) cases of positive Ki-67 expression after surgery in the control group. The difference between the two groups was statistically significant (p<0.05) (Table 2).

**Table 2**
**Analysis of clinical effects after operations**

| **Indicators** | **Main group (n = 46)** | **Control group(n = 46)** | **p** |
|---|---|---|---|
| Duration of operation (min | 122,54 ± 14,85 | 151,60 ± 19,81 | <000,001 |
| Intraoperative blood loss (ml) | 161,12 ± 10,694 | 218,53 ± 15,369 | < 0,001 |
| Cut length(cm) | 4,51 ± 1,065 | 13,14 ± 2,327 | < 0,001 |
| Complications: | | | |
| Incision infection | 1 | 4 | 0,028 |
| Pulmonary infection | 1 | 2 | |
| Anastomotic bleeding | 1 | 3 | |
| Intestinal obstruction | 1 | 2 | |
| Vein thrombosis of the lower extremities | 0 | 1 | |
| Vein thrombosis of the lower extremities | 0 | 1 | |
| No complications | 42 | 34 | |
| 5-year survival rate: | | | |
| Yes | 30 (65,22%) | 11 (23,91%) | < 0,001 |
| No | 16 (34,78%) | 35 (76,09%) | |
| Ki-67 | | | |
| Positive | 21 (45,65%) | 41 (89,13%) | < 0,001 |
| Negative | 25 (54,35%) | 5 (10,87%) | |

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## DISCUSSION

As is known, the pathogenesis of colorectal cancer is mainly associated with chronic inflammation of the colon, colorectal adenoma, and genetic factors. In recent years, technologies for minimally invasive approaches using endoscopic techniques have become increasingly interesting, which makes it possible to increase the efficiency of surgical treatment due to better visualization and more precise work of the surgeon [23].

However, in radical surgery, to improve the prognosis, it is necessary to take into account the specificity of the affected part. Elimination of postoperative complications and relapse rates negatively affects the quality of life of patients. The use of laparoscopic video-assisted surgery not only allows detection of small lesions that cannot be detected by open surgery, but also has the comparative advantage of reducing the rate of local recurrence and tumor surgery [2].

The results of our study showed that the operation time and incision length in the experimental group were shorter than those in the control group, and the difference was statistically significant. The amount of intraoperative blood loss in the main group was lower than in the control group, and the difference was also statistically significant. The results obtained indicate that, compared with open surgery, the duration of the operation and the length of the incision during laparoscopic surgery are shorter, and the amount of intraoperative blood loss is less.

The results of this study also showed that the incidence of complications in the study group was lower than in the control group, and the difference was statistically significant. The results obtained indicate that laparoscopic surgery is a safe method compared to traditional open surgery.

The 5-year survival rate in the main observation group was 65.22% (30/46) versus the same indicators in the control group (23.91% (11/46)). The difference was statistically significant ($p<0.05$).

## CONCLUSION

Videoleparoscopic interventions for colorectal cancer are not inferior in clinical effectiveness to traditional interventions: they are characterized by a decrease in the duration of the operation, a decrease in the volume of intraoperative blood loss and significantly reduce the frequency of postoperative complications as well as the length of stay of patients in the hospital.

The 5-year survival rate of patients after videolaparoscopic interventions for colorectal cancer has a therapeutic effect and we consider it appropriate for further clinical advancement.

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