

Laparoscopic Vs Open Surgery for Colorectal Cancer: Comparing Short-Term Results

ZAKIR AHMAD KHAN¹, AJMAL KHAN², MUHAMMAD BILAWAL KHAN³, KAMRAN KHAN⁴, MUHAMMAD WAQAS KHAN⁵, KARISHMA REHMAN⁶

¹Surgical Specialist, DHQ hospital Alpurai Shangla

²Surgical specialist, THQ, Matta swat

³Surgical Specialist, Police Services Hospital Peshawar

⁴District Surgeon DHQ, Alpurai Dist Shangla

⁵Senior Lecturer Pathology, Rehman Medical College Peshawar

⁶Trainee Medical Officer KTH, Peshawar

Correspondence to: Muhammad Bilawal Khan, Email: bilawal0872000002@gmail.com

ABSTRACT

Background: In developed countries, colorectal cancer continues to rank as the third-most prevalent cancer to be reported and the third-most popular reason for cancer mortality in both genders.

Objective: The purpose of the retrospective research was to compare the operational parameters and short-term oncological effects of laparoscopic surgery (LS) with traditional open surgery (OS) in colorectal cancer patients in our hospital.

Methods: In this study, 148 patients who underwent CRC surgery between January 2020 and January 2022 at the Medical Teaching Institute (MTI) Peshawar, Pakistan's Khyber Teaching Hospital and Hayatabad Medical Complex Hospital were included. 64 people who had all had LS were included in the study. On the other hand, 84 people who had had OS were randomly selected from groups of people who were of the same gender and age.

Result: In the group undergoing OS, the median of dissected lymph nodes was 22.8 (9–35) and 3 (0–14), whereas, in the group undergoing laparoscopy, the median number was 21.56 (8–32) and 6.2 (0–9). For 13 (15.47%) patients undergone through and 9 patients (14.06%) undergone through laparoscopy, blood transfusions were necessary. Although the LS group's procedure took longer than the OS group, their time in the ICU, time to start feeding and duration of stay at the hospital were all shorter.

Practical implication Importance Laparoscopic surgery has not been proven to be more effective than open surgery for patients with low rectal cancer.

Conclusion: LS provides the benefits of a shorter hospital stay and fewer problems and delivers relatively adequate lymph node dissection.

Keywords: laparoscopic surgery, open surgery, colorectal cancer, oncological outcomes, developing countries

INTRODUCTION

In developed countries, colorectal cancer continues to rank as the third-most prevalent cancer to be reported and the third-most popular reason for cancer mortality in both genders. The rate of newly diagnosed cases of colorectal cancer (CRC) was 1.8 million in 2018, and it grew to 1.93 million in 2020, according to Globacancer statistics. By 2040, it is predicted that this number might reach 3.2 million [2]. LS for CRC has been adopted in clinical practice somewhat gradually, despite numerous research demonstrating it is preferable to OS. Having been originally used to remove CRC in 1991, LS is now often performed [3]. LS has been proven over the past 20 years to be just as effective and efficient as traditional surgery in terms of attaining negative surgical margins, native recurrence, wound spot infection, survival rates, and intraoperative internal bleeding [4].

Laparoscopic colon resections are extremely complicated operations, making them originally unaffordable for most doctors, which is among the factors for the minimal dissemination of this therapy [5]. The surgeon must have extensive laparoscopic abilities, particularly the ability to manipulate and identify anatomy from various angles, to properly finish each component of the procedure [6]. When a tumour does not affect lymph nodes or approach the serosa, LS seems to be more recommended [7]. Numerous randomized controlled trials showed that the oncological results of LS were similar to OS based on the oncologic safety of the laparoscopic method to CRC [8]. The advantages of laparoscopic colorectal treatment include less internal bleeding, less postoperative anxiety, improved lung capacity, quicker recovery of bowel function, better outcomes, and quicker recovery [9]. Although there are possible short-term benefits and comparable cancer results, laparoscopic colorectal operation adoption rates are still poor in Europe and the USA [10].

The objective of this research was to associate the operational parameters and short-term oncological effects of LS with traditional OS in colorectal cancer patients. Importance Laparoscopic surgery has not been proven to be more effective than open surgery for patients with low rectal cancer.

MATERIAL AND METHODS

In this side-by-side investigation, 148 patients who had undergone CRC surgery in Hayatabad Medical Complex Hospital and Khyber Teaching Hospital, Medical Teaching Institute (MTI) Peshawar, Pakistan between January 2020 and January 2022 were included. The research comprised 64 individuals who experienced LS in total. In contrast, 84 individuals who had undergone OS were chosen at random from groups of similar genders and ages. Techniques for open and laparoscopic colorectal surgery were carried out by recent standard requirements.

Twenty-nine Patients who had undergone surgery for a mechanical intestinal blockage, had distant metastases, synchronous tumours, or had a body mass index of greater than 30 kg/m² were also disqualified from the trial. A skilled CRC surgical team carried out each treatment. The research comprised 148 patients all of who met the requirements. The NCCI Research Ethics Committee allowed this research. By colonoscopy and colonoscopic biopsy, CRC was identified and synchronous tumours were found. The patients who received LS and OS were split into two groups.

To conduct the statistical analysis, SPSS (v.21) was used. Age was provided as a mean SD, and a t-test was used to assess it. Analysis of the non-formally distributed data, represented by median and range, was conducted through the Mann-Whitney-U test. Data normality was analyzed by the Shapiro-Wilk test.

RESULTS

There were 148 patients in all, of whom 84 (56.7%) had OS, and 64 (43.3%) got LS (figure 1). Adenocarcinoma was the last pathological diagnosis for all cases. Thirteen individuals overall showed weakly differentiated adenocarcinoma, forty-seven had shown fairly differentiated adenocarcinoma, and eighty-eight had shown well-differentiated adenocarcinoma (figure 2). There were 13 patients (15.4%) classified as being in stage 1 during the OS, 35 patients (41.7%) as being in stage 2, and 36 patients (42.9%) as being in stage 3. During the laparoscopic procedure, 26 (40.7%)

patients were identified as being in stage 3, 29 patients (45.3%) as being in stage 2, and 9 patients (14.0%) as being in stage 1. In the group undergoing OS, the median number of dissected lymph nodes was 22.8 (9–35) and 3 (0–14), whereas, in the group undergoing laparoscopy, the median number was 21.56 (8–32) and 6.2 (0–9; table 1). For 13 (15.47%) patients who go through OS and 9 patients (14.06%) who go through laparoscopy, blood transfusions were necessary. Although the LS group's procedure took longer than the OS group, their time in the ICU, time to start feeding and duration of stay at the hospital were all shorter.

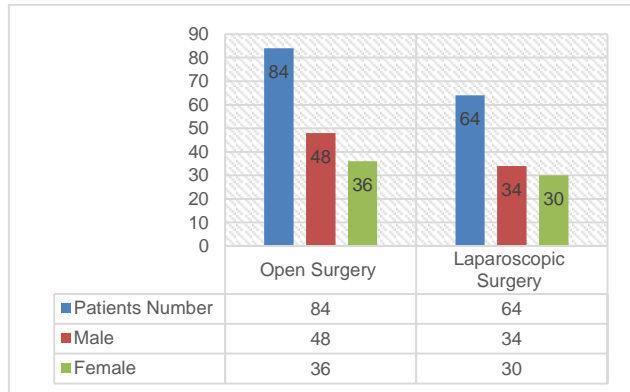


Figure 1: Number of patients who underwent OS as well as LS

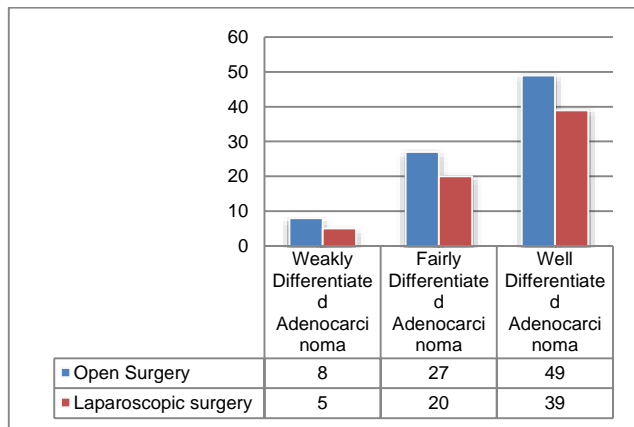


Figure 2: Differentiation of adenocarcinoma in OS and LS group

Table 1: Demographic information on the patients and tumours' pathogenic traits

| Characteristics | OS 84 | Laparoscopy Surgery 64 | P values |
|---|--------------|------------------------|----------|
| Age | 63.14 ± 8.47 | 64.78 ± 13.62 | 0.595 |
| Final stage n (%) | | | |
| 1 | 13 (15.4) | 9 (14.0) | 0.692 |
| 2 | 35 (41.7) | 29 (45.3) | |
| 3 | 36 (42.9) | 26 (40.7) | |
| T stage n (%) | | | |
| T1 | 11 (13.09) | 11 (17.18) | 0.545 |
| T2 | 24 (28.57) | 15 (23.43) | |
| T3 | 44 (52.38) | 36 (56.25) | |
| T4 | 5 (5.96) | 2 (3.14) | |
| N stage n (%) | | | |
| N0 | 35 (41.66) | 28 (43.75) | 0.127 |
| N1 | 45 (53.57) | 30 (46.87) | |
| N2 | 4 (4.77) | 6 (9.38) | |
| Number of LAP excised, median (min-max) | 22.8(9–35) | 21.56(8–32) | 0.628 |
| Malignant LAP excised, median (min-max) | 3(0–14) | 6.2(0–9) | 0.243 |

| Complications | | | |
|------------------------|------------|-----------|-------|
| Ileus | 7 | 6 | 0.458 |
| SSI | 7 | 2 | 0.023 |
| Leak | 4 | 2 | |
| Blood transfusion | 13 | 9 | 0.265 |
| Time in hospital (day) | 10.3 ± 6.7 | 7.2 ± 4.8 | 0.047 |

DISCUSSION

Oncological cases are presently treated successfully with LS. This research demonstrated that, when contrasted to oncological surgery, LS offers relatively appropriate lymph node dissection. Because of genetic susceptibility, age, ecological variables, and choice of lifestyle, the colorectal mortality rate is rising [11]. The advancement of technology has made it possible to treat colorectal cancer with less intrusive methods. The effectiveness of LS for colorectal cancer is being debated oncologically despite the many advantages that have been established [12]. In this study, single-centre laparoscopy was compared with OS for colorectal cancer taking into consideration the benefits and drawbacks, notably with oncological skill in the forefront [13]. Laparoscopy resulted in a two days reduction in hospital stay, according to Kang et al., (2010) research [14]. Additionally, according to different surveys that were identical, LS required a seven-day hospital stay while OS required an eight-day stay [15,16]. The literature was consistent with our study's findings, which showed that the average hospital stay after OS was 10.3 days and after LS was 7.2 days. Research by Kaya et al., (2021) involving a meta-analysis of 3,420 patients, showed that while the length of hospital stay was lower with laparoscopy, operating time was shorter with OS. Although OS took less time than LS in our investigation, there was no statistically significant difference [17]. In our research, two patients undergoing LS and four patients undergoing OS had leakage. In addition, six patients receiving LS and seven patients undergoing OS both had postoperative ileus.

In a study by Tong et al. (2017), a meta-analysis of 4,759 patients revealed that laparoscopy required less blood transfusion than OS [18]. There was no difference between the two groups in the study by Sheng et al., (2018) regarding the need for blood transfusions [19]. In our research, the laparoscopic group consistently required less blood transfusion than the comparison group. When comparing the proximal, distal, and radian surgical margins and the number of lymph nodes removed between open and laparoscopic operations, Liang et al., (2011) found no discernible difference between them [20]. In our study, OS involved the dissection of an average of 22.8 lymph nodes, whereas laparoscopy involved the dissection of an average of 21.56 lymph nodes.

CONCLUSIONS

So, compared to open oncological colon surgery, LS has several benefits. It provides the benefits of a shorter hospital stay and fewer problems. The study did demonstrate, however, that lymph node dissection and an appropriate surgical margin are both achievable goals. As far as oncology is concerned, we believe LS for colon malignancies is safe.

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