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Original Research Article

Our experience at Bangabandhu Sheikh Mujib Medical University on laparoscopic assisted surgery for rectal cancer

M. Shahidul Islam[1]*, Munsur Miah[1], M. Sumon Ali[1], Joynab Akter[1], Muhammad Ali Siddiquee[1], Asif Almas Haque[1], Tasmina Hossain[1], Mir Rasekh Alam Ovi[1], Mohammad Farouque Eastiak[2]

[1]Department of Colorectal Surgery, BSMMU, Dhaka, Bangladesh
[2]Department of Surgery, BSMMU, Dhaka, Bangladesh

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***Correspondence:**
Dr. M. Shahidul Islam,
E-mail: drshahidulislam71@icloud.com,

ABSTRACT

Background: Rectal cancer is a leading cause of mortality worldwide, with laparoscopic surgery emerging as a viable alternative to open surgery due to its benefits in postoperative recovery, pain management and survival rates. Despite its advantages, laparoscopic colorectal resection faces scrutiny over oncologic safety and technical demands, limiting its widespread adoption.
Methods: This retrospective descriptive study analyzed 60 patients with colorectal adenocarcinoma treated at the Department of Colorectal Surgery, BSMMU, from January 2018 to December 2018. Inclusion criteria encompassed clinically diagnosed colorectal cancer with histological confirmation. Data on demographics, tumor characteristics, surgical details and postoperative outcomes were collected and analyzed with SPSS software.
Results: Among the 60 patients, 32 were male, with a mean age of 52 years. Tumors within 5 cm of the anal verge necessitated abdominoperineal resections (n=44), while anterior resections were performed for the remaining (n=16). All patients achieved adequate proximal margins (>5 cm) and most (90%) had distal margins >2 cm. The average operative time ranged from 190 to 270 minutes, with no intraoperative complications and a postoperative stay of 3-5 days. Patients reported less postoperative pain and faster recovery.
Conclusions: Laparoscopic colorectal surgery demonstrated similar oncologic outcomes to open surgery but involved a longer operative time and required advanced surgical skills. The benefits included reduced blood loss, lower postoperative pain and a shorter hospital stay, although costs were higher. A need for expert surgeons in selected patients is emphasized for optimal outcomes. Laparoscopic resection for rectal cancer aligns with oncologic principles and offers a safe, effective approach, yielding improved recovery metrics compared to traditional surgery. Further analysis on cost-effectiveness, especially for lower socioeconomic populations, is warranted to enhance accessibility.

Keywords: Colorectal cancer, Laparoscopic surgery

INTRODUCTION

Rectal cancer is one of the leading causes of death worldwide, with laparoscopic surgery indications gradually expanding. Laparoscopic colorectal resection has demonstrated significant benefits for postoperative recovery, such as reduced postsurgical pain, shorter hospital stays, and improved long-term survival.[1] Consequently, laparoscopic surgery is increasingly accepted as an alternative to conventional open surgery

for colon cancer.[1,2] Globally, approximately 1.2 million new colorectal cancer cases occur annually, accounting for roughly 10% of all rectal cancer cases, with an estimated 609,000 deaths from the disease. Although age-standardized incidence rates are lower for women than men, there has been a noticeable increase in younger patients. A study using data from the Surveillance, Epidemiology and End Results (SEER) program reported a significant rise in colorectal cancer (CRC) incidence over the last 20 years among patients aged 20 to 49, with the sharpest increase in the 40 to 44 age group. Colon cancer rose by 56%, and rectal cancer by 94% in this cohort.

Despite the theoretical advantages of laparoscopic surgery, it has not yet become the standard treatment for colorectal cancer due to concerns about oncologic stability. Potential risks include port-site recurrence after curative resection and incomplete lymph node dissection.[3,4] Furthermore, the technical complexity of laparoscopic colorectal resection often necessitates highly experienced surgeons.[5] From a public health perspective, debates continue about the cost-effectiveness of this treatment, especially considering the higher economic costs compared to conventional surgery.[6] Over the past two decades, advances in chemotherapy, radiotherapy, and surgical techniques, such as total mesorectal excision, have significantly improved colorectal cancer survival rates, largely due to earlier diagnosis and more effective treatment.[7]

METHODS

Study type

This is a retrospective descriptive study.

Study place

we have analyzed 60 patients who were admitted at Department of Colorectal Surgery BSMMU, Dhaka, Bangladesh, diagnosed with colorectal cancer.

Study duration

The period of study was from January 2018 to December 2018.

Inclusion criteria

Patients with rectal adenocarcinoma with histological confirmation, and the absence of abdominal adhesions were included.

Exclusion criteria

Locally advanced disease, metastatic disease, acute bowel obstruction or perforation from cancer, severe medical illness, pregnancy and recurrent cancers were excluded.

All patients underwent mechanical bowel preparation on the day before the operation and also advised to take liquid diet only a day before the operation. Pre-operatively, antibiotics were given and continued thereafter for a day or two. Patients were informed about the procedure, risks and possible intraoperative and postoperative complications and informed written consent taken. The operation was performed according to conventional classical descriptions based on the oncologic principles described by Heald for resection of mesorectum. For laparoscopically assisted resections, a pneumoperitoneum achieved by using CO2 gas, the flow used was 2 liters per minute to maintain maximum working pressure of 12 mmHg. Patients with adenocarcinoma of the rectum within 5 cm from the anal verge underwent abdominoperineal resection and those with tumor above 5 cms. underwent anterior resection.

Extraction of specimen may be done in the left flank or via a Pfannenstiel incision. Descriptive variables like age and gender, whereas outcome variables like type of resection, number of resected lymph nodes, proximal. Distal and circumferential margin need for ostomy, complications, operating time and hospital stay are noted and analyzed with SPSS software. Ethical clearance was taken from IRB of the University.

RESULTS

A total 60 patients underwent laparoscopic surgery for colorectal cancer between January 2018 and December 2018, of which 32 patients were male. Mean age was 52 years. The range being 29-76 years.

Figure 1: Lymphadenectomy.

Figure 2: Laproscopic image.

Figure 3: APR specimen.

Figure 4: AR specimen.

Location of the tumor within 5 cms. from anal verge was observed in 44 patients who underwent lap abdominoperineal resection and in others the tumor was more than 5 cms above the anal verge. They underwent lap anterior resection. Out of 60 patients, T stage was T1=0, T2 in 36 cases and T3 in 22 cases, T4 in 2 patients, regarding N staging, N0=32, N1=8, N2=16, N3=4.

In all patients proximal and distal and circumferential margins were free of tumor except in two patients' circumferential margin were positive, all patients had adequate proximal margin, proximal margin was more than 5 cms in 94% of cases. But the distal margin was less than 2 cms in 10% of cases, least being 0.4 cms in one patient meaning 90% patients had distal margin more than 2 cms. Two patient required conversion to conventional surgery.

Protective ileostomy was done in one patient. Operating time ranges from 190-270 minutes, with most cases taking more than 4 hours. There were no intraoperative complications, decreased postoperative mortality, no readmission, no anastomotic leak.

Patient had less postoperative pain resulting in decrease use of parenteral narcotics and oral analgesics. Early mobilization of the patient and early recovery of peristalsis were also noted. Postoperative stay was 3-5 days, Patients who underwent anterior resection (AR) went home early compared to patient who underwent APR.

Table 1: Characteristics of the patients.

Characteristics	
Age (in years)	Range :28-76, Mean 52±SD 3.2
Sex	M: 28 (47%), F: 32 (53%)
Tumor 5 cms above the anal verge	16
Tumor within 5 cms from anal verge	44
Index operation	
LAP APR	44
LAP AR	16
Operative quality index	
Proximal margin of specimen >5 cms achieved	56 (94%)
Proximal margin of specimen >5 cms not achieved	4 (6%)
Distal margin of >2 cms achieved	54 (90%)
Distal margin of >2 cms not achieved	6 (10%)
Circumferential margin positive	2 (3.3%)
Tumor characteristics	
Well differentiated	6 (10%)
Moderately differentiated	38 (63.3%)
Poorly Differentiated	16 (26.7%)
pT1	0 (0.00%)
pT2	36 (60.0%)
pT3	22 (36.7%)
pT4	2 (3.3%)

DISCUSSION

This study evaluated the outcomes of laparoscopic surgery for colorectal cancer, demonstrating favorable results in terms of oncologic margins, postoperative pain, and hospital stay. The findings align with existing literature that supports the efficacy of laparoscopic techniques in managing colorectal malignancies.

The patient demographics in this study, with a mean age of 52 years and a predominance of male patients (53%), are consistent with the general epidemiology of colorectal cancer, which shows higher incidence rates in men and a rising trend among younger populations.[9] The tumor staging revealed that the majority of patients had T2 or T3 tumors, similar to findings from other studies that emphasize the importance of early detection in improving surgical outcomes.[10]

The surgical margins achieved in this cohort were noteworthy. A 94% rate of proximal margins greater than 5 cm and a 90% rate of distal margins exceeding 2 cm are significant, especially given that adequate margins are crucial for reducing local recurrence rates.[11] In contrast, a study by DeNardi et al. reported similar findings with laparoscopic resections, indicating that these approaches can yield oncological safe margins comparable to open surgery.[12]

Notably, the conversion rate to open surgery was 3.3%, which is within the range reported in the literature, typically ranging from 5% to 20%.[13] This indicates that, while laparoscopic techniques can be technically challenging, they can be safely performed with appropriate patient selection and surgical expertise.

The absence of intraoperative complications and the reduced postoperative pain, resulting in lower usage of parenteral narcotics, aligns with previous studies that highlight the minimally invasive nature of laparoscopic surgery. For instance, a meta-analysis by Cao et al, demonstrated that laparoscopic approaches significantly reduce postoperative pain and lead to earlier mobilization compared to open surgery.[14]

The average postoperative stay of 3-5 days is also consistent with findings from similar studies, which report shorter hospital stays with laparoscopic methods.[15] The quicker recovery observed in anterior resection patients compared to those undergoing abdominoperineal resection may reflect differences in surgical complexity and the associated recovery times, a trend also noted in other comparative studies.[16] Despite these positive outcomes, it is essential to acknowledge the increased operating time, averaging over 240 minutes for most procedures. This aligns with previous findings, which indicate that laparoscopic surgeries often require longer durations than their open counterparts, particularly due to the learning curve associated with mastering laparoscopic techniques.[17]

Limitation of the study were small sample size and data from single institution only.

CONCLUSION

This study reinforces the notion that laparoscopic surgery for colorectal cancer is a safe and effective approach, yielding positive oncologic outcomes and enhanced postoperative recovery metrics. However, the necessity for experienced surgeons and careful patient selection remains paramount to optimizing outcomes in this population.

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