Original Article

Short-Term Outcomes of Colorectal Cancer Surgeries: Insights from National Institute of Cancer Research and Hospital

***Rahman AM[1], Fatema NE[2], Islam MN[3], Rahman MA[4], Ariph MGU[5]**

Abstract

Background*: Surgical resection is the principal treatment for colorectal cancer, but it carries significant morbidity and mortality. To see the Short-Term Outcomes of Colorectal cancer surgeries.*
Methods and Materials*: This cross-sectional study was carried out from January 2017 to August 2018.*
Results*: A total fifty-nine (59) patients with colorectal Aden carcinoma with defined inclusion and exclusioncriteria were evaluated. Most of the complications occurred in the male group (33.9%) and in the >50 yearsage group (17%). Forty four percent (44%) of cases were in the pathological stage pT2NOMX (Stage I). Themost common complication (56%) was wound infection. The most frequent complication of surgery was wound infection. Postoperative complications were more in the rectal cancer patients than in coloniccancer cases. Patients operated only laparoscopy had less preoperative blood loss, less postoperative hospital stays and lower complication rates (p<0.05).*
Conclusions*: The laparoscopic approach influences the postoperative outcomes following colorectal cancer surgery. Measures should be taken to reduce the postoperative wound infection.*

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Keywords: *Colorectal cancer, Postoperative complications, Wound infection, Laparoscopic surgery, Short-term outcome*

Introduction

Colorectal cancer (CRC) is the third most common malignancy and the second leading cause of cancer related deaths worldwide[1]. Its prevalence in Bangladesh is 6.5% in males and 2.7% in females[2]. The curative treatment of CRC is surgery. This has been revolutionized by the concept of "Complete mesocolic excision (CME), central vascular ligation (CVL) and D3 lymphadenectomy" i.e., mesocolic excision within an intact mesenteric fascia, ligation of the vascular origin and removal of all lymph nodes along the arterial root, introduced by Hohenberger et al. in 2009[3]. Although the molecular approach to treatment has recently been introduced in the treatment algorithm of colorectal cancer treatment guidelines. National Comprehensive Cancer Network (NCCN) recommends examination of at least 12 lymph nodes to establish the N stage in CRC[4]. Surgical resection of metastatic disease is considered whenever possible. The survival of CRC patients depends on multiple factors, including the stage of disease at diagnosis, patient characteristics, tumor biology and treatment differences. Short term Short term outcome of surgery for CRC is important in the sense that it reflects not only the immediate effect of surgery but also affects the long-term outcomes[5]. Patients who experience complications in the early postoperative period demonstrate long termfunctional results, increased local recurrence rates and reduced 5-year cancer survival 5 and the complication rates are more in the advanced stage of the tumour[6]. Surgical institutions often use operative mortality, complications, length of stay, readmission rate, patients' satisfaction, functional health status and other measures of health-related quality of life.

1. *Dr. Ahmed Mizanur Rahman, Associate Professor (Surgical Oncology), National Institute of Cancer Research and Hospital (NICRH), Mohakhali, Dhaka, Bangladesh.
2. Dr. Noor-E-Fatema, Junior Consultant (Gyn & Obs), NICRH.
3. Professor Dr. Molla Nazrul Islam, Professor of Surgery, President Abdul Hamid Medical College, Kishoreganj, Bangladesh.
4. Dr. Md. Aminur Rahman, Associate Professor (Gynae &Obs), President Abdul Hamid Medical College, Kishoreganj, Bangladesh.
5. Dr. Md. Ghiyas Uddin Ariph, Junior Consultant (Surgery), Shaheed Sayed Nazrul Islam Medical College, Kishoreganj.

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Address of Correspondence:Dr. Ahmed Mizanur Rahman, Associate Professor (Surgical Oncology), National Institute of Cancer Research and Hospital (NICRH), Mohakhali, Dhaka, Bangladesh.

Measurement and comparison of postoperative outcomes may derive improvement in perioperative care and may help surgeons to improve their practice. Several studies measured short term outcomes in terms of postoperative complications, duration of operation, intraoperative blood loss, postoperative pain, recovery of intestinal function, length of hospital stay, mortality andqualityoflife. Oncological outcomes described inliteratures as short-term outcomes are extent of of resection, number of lymph nodes (LNs) harvested, local recurrence, survival, etc[7,8].

Methods

This cross-sectional study was carried out from January 2017 to August 2018 in the Department of Surgical Oncology, NICRH, Dhaka, Bangladesh. A total fifty-nine postoperative patients with histologically proven primary colorectal adenocarcinoma comprising new cases ofcolon cancers and rectal cancer (including cases who received total neoadjuvant therapy, TNT) were included. Patients with residual cancer, recurrent CRC, who underwent palliative surgery were excluded from the study. CRCs were grouped into colon and rectal cancers. All patients were followed up in the postoperative period during hospital stay and inquired about any morbidity and mortality also recorded within 30 days following surgery. Patients who had uneventful recovery were compared to those who had eventful recovery. The short-term outcomes of open and laparoscopic colorectal cancer surgeries were measured in terms of complication rate, stage of disease, total time needed for operation, preoperativeblood loss, time to pass first flatus, time to tolerate normal diet, time to become ambulant, mortality, postoperative hospital stay, pathological status, margin status and number of lymph nodes retrieved. Quantitative data were expressed as mean and standard deviation. Qualitative data were expressed as frequency and percentage and comparison was carried out by Chi-square (χ^2) test. A probability value (p) of less than 0.05 was considered to indicate statistical significance.

Results

Among 59 patients, most of the patients (46,78%) were in the 40-60-year age group and complications developed in 52.0% of 46 patients in this age group. Thirty-eight (38, 64.0%) were male, 21(36.0%) were female and complications developed in 21(55.0%) of the male and 11(52.0%) of the female patients. Thirty-six cases (61.0%) were rectal cancer and 23(39.0%) were colonic cancers and most of the complications occurred in rectal cancer group (20, 34.0%). Complications developed in 32(54.0%) out of 59 cases, ranging from Clavein Dindo Grade I surgical complication (e.g., minor wound infection) to Grade V complication (e.g., postoperative death). A total of 17 patients had comorbidities, 6 of them had more than one comorbidity at the same time. In all atients' comorbidities were corrected preoperatively. Fifteen of the patients with comorbidities developed postoperative complications.

Table I: Demographic and clinicopathological characteristics of patients (n=59)

Variables	Frequency (n)	Percentage (%)
Age	05	08.4
<40	46	78.0
40-60	08	13.6
>60	05	08.4
Sex		
Male	38	64.4
Femal	21	35.6
Site of lesion		
Colon	23	39.0
Rectum	36	61.0
Comorbidity		
Absent	42	71.2
Present	17	28.8
Tumour grade		
Well differentiated	09	15.2
Moderately differentiated	33	56.0
Poorly differentiated	17	28.8
Stage of disease		
Stage I	26	44.0
Stage II	09	15.3
Stage III	21	35.6
Stage unknown	03	05.1

In this study, 33(56.0%) patients had moderately differentiated tumour grade. Most of the patients (26 cases, 44.0%) were in the pathological stage I (PT2N0) stage group. Twenty-one patients were in stage III. In three patients, accurate histopathological staging could not be done

(pT2NX, pT3NX) (Table I). Forty-eight (n=48, 80.0%) patients underwent open surgery and 11(20.0%) underwent laparoscopic surgery. Complications developed in 29(49.0%) of open surgeries and 3(5.0%) of laparoscopic surgeries. Two laparoscopic cases were converted to open surgery (conversion rate 3.4%). The most performed operation was open abdominoperineal resection of the rectum (19 cases, 32.0% (Table I). Among 32 patients with complications the most frequent complications was surgical siteinfection, accounting for 59 cases (30.50%). The next common complication was anastomotic leak, 4 cases (6.77%) which were more frequent in open surgeries.

Table II: Frequency of different postoperative complications following Open Surgery (OS) and Laparoscopic Surgery (LS).

Postoperative complications	OS Approach	LS Approach
	n (%)	n (%)
Seroma	02 (03.4)	-
Surgical site infection	14 (24.0)	02 (03.4)
Anstomotic leak	04 (06.8)	-
Intra abdominal abscess	01 (01.7)	-
Ileostomy/colostomy somplicaions	01 (01.7)	-
Burst abdomen	01 (01.7)	-
Perineal wound dehiscence	02 (03.4)	-
Acuterenal failure	01 (01.7)	-
Ureteric injury	-	01 (01.7)
Postoperative bleeding	01 (01.7)	01 (01.7)
Urethral injury	01 (01.7)	-
Total	28 (47.4)	04 (06.7)

Surgical site infection was more common in patients operated by open approach 15(48.0%). Next frequent complication was anastomotic leak (4 cases, 13.0%), which occurred in open surgery group (Table II). The laparoscopy group was found to have less preoperative bleeding, less mortality, less postoperative hospital stays and earlier functional recovery. But time to ambulate following surgery were similar in both groups. More than 12 lymph nodes retrieved in 64.0% of open approaches and 54.0% of laparoscopic approach.

Table III: Short term outcomes in open surgery (OS) and laparoscopic surgery (LS) approaches.

Outcomes	Values	OS	LS	p value
	n (%)	n (%)	n (%)	
Operating time (min)	<180	28 (47.0)	05 (08.0)	>0.05
	>180	20 (34.0)	06 (10.0)	
Peroperative blood loss (ml)	>300	36 (61.0)	10 (17.0)	<0.05
	<300	12 (20.0)	01 (02.0)	
Time of pass flatus	-	4.16±2.07	2.18±0.40	-
Time of tolerate normal diet	-	6.91±3.88	3.36±1.50	-
Time of abulate		4.87±3.58	4.00±1.89	
Postoperative (days)	<10	19 (32.0)	08 (14.0)	<0.05
Hospital stay (days)	>10	29 (49.0)	03 (05.0)	
LN retrieved	<12	17 (29.0)	05 (08.0)	<0.05
	>12	31 (53.0)	06 (10.0)	
Postoperative complications	No	20 (34.0)	07 (12.0)	<0.05
	Yes	28 (47.0)	04 (07.0)	
Mortality	No	46 (78.0)	11 (19.0)	
	Yes	02 (03.0)	-	

Discussion

This study was conducted to evaluate the risk factors for morbidity following surgeries for CRCs. The observed difference in postoperative complication rate in colon cancer group (12 out of 23 cases, 52.0%) and rectal cancer group (20 out of 36 cases, 55.0%) was not statistically significant, (χ^2=0.064, p-value >0.05). Surgical site infection was the most frequent surgical complication, occurred in 30.5% cases. It was present more in rectal cancer surgery than colon cancer operations, (23.7% vs 6.8% cases) (χ^2=3.06, p-value >0.05) (Table II) and in open surgery than laparoscopic surgery (33.3% vs 18.2%) (χ^2=3.63, p-value >0.05). Study by Murray et al. Shows overall surgical site infection rate 12.3%[9]. Rectal resection was associated with overall surgical site infection in comparison with left-or right-sided colonic resections[10]. A study conducted by Rahman et al. found surgical site infection in 52.0% of open surgery cases but no infection in the laparoscopic group. The 30-day mortality rate was 3.4%. In literatures, postoperative mortality of 2.0% to 6.0% following colorectal cancer resection has been described[11]. In a study by Sjo et al. The mortality rate was 3.5% in elective cases and 10.0% in emergency patients and the overall complications rates were 24.0% and 38.0%, respectively[12], whereas Nickelsen et al. recorded 3.9% 30-day mortality[13]. The high incidence of postoperative overall complication rates in this study may be due to the high rate of surgical site infection (56.0% of 32 cases of complication. The higher rate of complications in rectal cancer surgeries may be due to the increased number of patients receiving CCRT before surgery, thereby downstaging the tumourbut increasing the rate of complications. Short-term outcome differences between laparoscopic and open surgery were observed. Regarding operating time, 58.3% (28 cases) of open surgery cases had an operating time less than 180 minutes and six (54.5%) of LS cases took more than 180 minutes. The difference was not statistically significant (χ^2=0.60 p-value >0.05). This may be due to extensive adhesion following CCRT, surgeons' expertness in the early stage of the learning curve of LS, thereby a reason for increased time of operation. These findings are same as the finding of study by Tominaga where the LS group had longer operating time[14]. The observed difference in postoperative complication rate in the OS group and LS group was not statistically significant (χ^2 =1.73, p-value >0.05). A recent study shows that OS group had a higher incidence of overall postoperative complications than the LS group, 25.1% vs. 35.2%[6]; The length of postoperative hospital stays (prolonged when >14 days) significantly differed between 29(76.0%) out of 38 patients of OS and in 3(27.0%) out of 11 cases of LS (χ^2=3.96 p-value <0.05) (Table II), indicating that the LS group had a lower length of postoperative hospital stay. This is in contrast to a study by Ding et al., which shows no differences in terms of length of hospital stay between LS and OS group[15]. Whereas, Chen et al. found the LS group was associated with shorter postoperative hospital stay than the OS group (11.12 days vs. 12.47 days, respectively)[16]. The number of LNs retrieved >12 following OS were observed in 28(62%) cases and 540% of LS group. This observed value was not statistically significant, (χ^2=1.02 p-value >0.05), signifying that LS approach of CRC achieved LNs retrieval similar to that achieved by the OS approach. The mean time to pass flatus after surgery (4.16±2.07 days in the OS group vs. 2.18±0.40 days in the LS group and the mean time to start oral feeding were shorter in the LS group (6.91±3.88 days in open surgery vs. 3.36±1.50 days in LS group). However, the mean time ambulate following surgery was almost same in both groups.

Conclusion

The laparoscopic approach to surgery resulted in less peroperative blood loss and shorter lengths of postoperative hospital stays. The number of lymph nodes retrieved is not affected by the approach of surgery. Preoperative optimization, treatment of comorbidities and adopting a laparoscopic approach may result in improved postoperative outcomes.

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