

Comparison of Laparoscopic versus Open Bowel Resection in Management of Colorectal Carcinoma Patients

Laparoscopic versus Open Bowel Resection in Colorectal Carcinoma

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ABSTRACT

Objective: To compare the outcomes of laparoscopic and open bowel resection in management of colorectal carcinoma, so that a better technique can be adopted with less complication rate in less time duration.

Study Design: Randomized controlled trial

Place and Duration of Study: This study was conducted at the general surgery department of Nishtar Hospital Multan from June, 2021 to May, 2022.

Materials and Methods: A total of 138 patients elective of emergency colorectal cancer were enrolled in study and divided into two groups 69 patients in open surgical technique group and 69 in laparoscopic group. Main variables of study were hospital stay and surgical site infection (incision site infection). SPSS version 23 was used for data analysis.

Results: The Laparoscopic Group had lower postoperative incisional infection than the open bowel Group as 30.4% and 55.1%, respectively, ($p=0.003$). Further, the average duration of stay in hospital in Laparoscopic Group was shorter than the open bowel Group as 8.21 ± 2.48 days and 12.48 ± 3.05 days, respectively, ($p<0.001$).

Conclusion: In selected group of patients with early stage of colorectal cancer laparoscopic technique is safe alternative of open surgical technique in terms of postoperative hospital stay and incision wound infection.

Key Words: Colorectal cancer, Laparoscopic, Open bowel resection, Hospital stay, Surgical incision infection

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INTRODUCTION

Colorectal cancer is also known as cancer of colon and rectum which represents the uncontrolled cell growth in these parts of intestine¹. It is the 2nd most common cancer among women population and 3rd common cancer in men with 9.7% world incidence². Signs and symptoms of colorectal cancer varies with location of tumor in bowel, it may spread to the other body areas. Some clinical signs of its worsening include blood in stool, constipation, loss of weight, loss of appetite, decrease in stool caliber, nausea and vomiting³.

In patients of age 50 years or above anemia and rectal bleeding are signs of high risk. Other usual symptoms such as change in bowel and weight loss are only considered with typical bleeding⁴.

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Initial diagnosis of colorectal cancer can be made with biopsy sampling during colonoscopy or sigmoidoscopy. Treatment plan of colorectal carcinoma varies similarly with size of tumor degree of metastasis and location of cancer⁵.

Stage of tumor is totally based TNM classification system which is totally determined by lymph node involvement, spread of tumor and amount of metastasis⁶. Prognosis of colorectal carcinoma depends on 5 year survival rate with range up to 60%. Attainment of optimized surgical technique is under debate but recent introduction of neo adjuvant therapies and latest development in imaging field made it easier and successful⁷. Management is particularly challenging technically for the surgeon and local recurrence within the pelvis is a common result of treatment failure⁸. Surgery is the only curative modality for localized colon cancer (stage I-III) and potentially provides the only curative option for patients with limited metastatic disease in liver and/or lung (stage IV disease)⁹. The general principles for all operations include removal of the primary tumor with adequate margins including areas of lymphatic drainage¹⁰.

As increased mortality rate reported with colorectal carcinoma, so proper evaluation and timely management in these patients should be required in order to reduce the morbidity and mortality. We have decided to conduct this study to compare the outcomes

of laparoscopic and open bowel resection in management of colorectal carcinoma, so that a better technique can be adopted with less complication rate in less time duration.

MATERIALS AND METHODS

Study was carried out at general surgery department of Nishtar hospital Multan from 1st June 2021 to 31 May 2022. After approval from the ethical review committee and written informed consent was obtained from patients. Non probability consecutive sampling technique was used. Sample size was calculated by using who sample size calculator using statistics of P1 = 2.04 %, P2 = 7.6 %, Confidence Interval = 90%, Power of study = 70%.

A total 138 patients of colorectal carcinoma admitted on elective or emergency were enrolled in study. Patients were divided into two groups (Laparoscopic and open colorectal surgical technique) by lottery method. Patients in laparoscopic group colorectal surgery were performed using laparoscopic technique and in open surgical technique were used in other group. Demographic information like age, sex and type of operation were recorded.

The data was analyzed by computer software SPSS version 20.0. Mean and standard deviation for age, hospital stay was calculated. The qualitative variables like gender, infection, were calculated as frequency and percentage. Effect modifiers like age and gender were controlled through stratification and post-stratification chi square were applied to see their effect on clinical stage. P-value ≤ 0.05 was taken as significant.

RESULTS

Overall, 138 patients were included in our study. Half of the patients treated with Laparoscopic procedure and half of the patients treated with open bowel procedure. The average age of Laparoscopic and open bowel procedure patients was 35.18±8.76 years and 38.15±8.85 years, respectively, (p=0.061). The distribution of male and female in both the groups was almost same, (p=0.576) (Table. I).

Table No.1; Comparison of demographic characteristics of both the groups

Characteristic	Group		p-value
	Laparoscopic n=69 (50.0%)	Open Bowel n=69 (50.0%)	
Age (years)	35.18±8.76	38.15±8.85	0.061
Gender			
Male	47 (68.1%)	50 (72.5%)	0.576
Female	22 (31.9%)	19 (27.5%)	

The Laparoscopic Group had lower postoperative incisional infection than the open bowel Group as 21 (30.4%) and 38 (55.1%), respectively, (p=0.003) (Figure-I). Further, the average duration of stay in hospital in Laparoscopic Group was shorter than the open bowel Group as 8.21±2.48 days and 12.48±3.05 days, respectively, (p<0.001) (Table. II).

Table No.2: Comparison of postoperative incisional infection and hospital stay of both the groups

Characteristic	Group		p-value
	Laparoscopic n=69 (50.0%)	Open Bowel n=69 (50.0%)	
Postoperative incision infection			
Yes	21 (30.4%)	38 (55.1%)	0.003
No	48 (69.6%)	31 (44.9%)	
Hospital stay (days)	8.21±2.48	12.48±3.05	<0.001

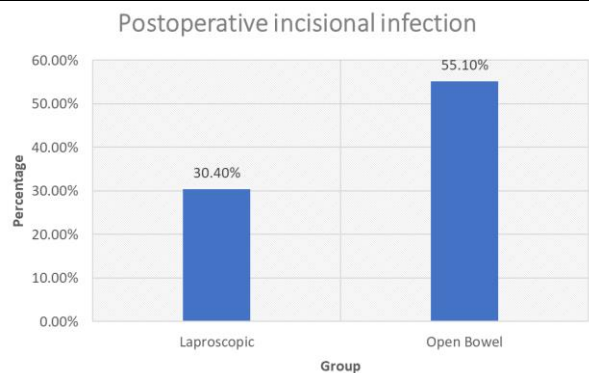


Figure No.1: Postoperative incisional infection

DISCUSSION

Safety and feasibility of laparoscopic colorectal resection was reported in previous literature, rate of revision surgery and recurrence was reported very low in this technique if done with experienced hands¹¹. In our study mean hospital stay was 8.21±2.48 days in laparoscopic group and 12.48±3.05 days in open surgery. A study was carried out by Braga et al¹² and reported less hospital stay 10.4 ± 2.9 days as compare to open surgical technique 12.5 ± 4.1 days.

In a study Chapman et al¹³ reported that although hospital stay and wound infection is lesser with laparoscopic study but evidence of laparoscopic colorectal resection is not clear because of insufficient margin differentiation. Lacy et al¹⁴ conducted a comparative study on open and laparoscopic technique for colorectal carcinoma and reported shorter hospital stay and infection rate with laparoscopic technique as 6% wound infection was observed in open group and 4% in laparoscopic group.

In our study incision infection was observed in 55% cases in open group and 30.4% in laparoscopic group. Stage et al¹⁵ conducted a study on comparison of both techniques and reported that laparoscopic technique is safe and right alternative of open technique. Milsom et al¹⁶ also carried out a study on efficacy of surgical technique used for colorectal cancer and reported similar findings as in our study.

Liang et al¹⁷ reported in his study that although, laparoscopic technique is expensive but shorter hospital stay compensates the extra cost of procedure. Other benefits include shorter surgery time and postoperative infection. In a study Ustuner et al¹⁸ reported that there was no difference between open surgical and laparoscopic technique regarding shorter outcomes like hospital stay and wound infection.

A series of colorectal surgeries by laparoscopic was published in 1991 by Jakops et al¹⁹ and reported this technique is increasing in the world. With increase in surgeons experience outcomes and efficacy of laparoscopic technique become more refined and reliable²⁰.

CONCLUSION

Our results reveals that in selected group of patients with early stage of colorectal cancer laparoscopic technique is safe alternative of open surgical technique in terms of postoperative hospital stay and incision wound infection.

Recommendations: Further studies on large sample size and multicenter analysis required along with awareness programming of early diagnosis and treatment of colorectal carcinoma are recommended.

Author's Contribution:

Concept & Design of Study:	Saim Athar
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Final Approval of version:	Saim Athar

Conflict of Interest: The study has no conflict of interest to declare by any author.

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