

A COMPARATIVE STUDY ON THE OUTCOME OF ILEOSTOMY VERSUS COLOSTOMY FOR TEMPORARY DIVERSION OF RECTAL ANASTOMOSIS

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Abstract: Temporary diversion with a stoma is often required in patients undergoing rectal resection for rectal cancer to minimize anastomotic complications. Loop ileostomy and loop colostomy are the two common options for fecal diversion. Despite their widespread use, the comparative outcomes regarding morbidity and complications of these procedures, especially in the context of temporary diversion, remain debatable. **Objective:** To compare the outcomes of loop ileostomy and loop colostomy for temporary rectal diversion in cancer patients undergoing rectal resection. **Methods:** A prospective study was conducted in the General Surgery Department of Nishtar Hospital, Multan from June 2024 to November 2024. A total of 150 rectal cancer patients undergoing anterior resection were included in the study. Patients were divided into two groups; Group A included 75 patients undergoing loop ileostomy and Group B included 75 patients undergoing loop colostomy. The primary outcome was to perform a comparison between morbidity outcomes after stoma formation and closure between both procedures. Patients were followed up after every 2-4 weeks in OPD after stomal construction and reversal. **Results:** After stomal construction, the incidence of complications between both groups was similar. Overall morbidity occurred in 23 patients (30.6%) in group A and 21 patients (28%) in group B. The parastomal hernia was the most common complication in the study population in 31 patients (20.6%), the difference in both groups was insignificant (20% vs 21.3%) ($p=0.78$). After the stomal reversal, 4 (8%) in group A and 1 (1.9%) in group B had anastomotic leaks, however, the difference was insignificant ($p=0.19$). 50 (66.7%) patients in the ileostomy group and 51 (68%) patients in the colostomy group underwent stoma reversal. Complications after reversal were similar with the most common complication being wound infection (14 vs 7.9%) ($p=0.53$). **Conclusion:** The outcomes of loop ileostomy and loop colostomy for temporary diversion of rectal anastomosis in patients with rectal cancer were comparable. Larger, randomized studies are needed to verify our findings.

Keywords: Colostomy, Ileostomy, Ostomy, Rectal Cancer

Introduction

Rectal cancer is primarily treated and cured with surgical resection of the bowel. However, anastomotic leaks are a common fatal complication during low anterior resections occurring in 3-30% of patients which leads to death in 6-23% of cases (1, 2). In order to reduce the morbidity and mortality rate of resection, it is followed by the diversion of temporary loop stoma until anastomosis is completely healed (3, 4). Recent literature suggests that fecal diversion after rectal resection with and without stoma does not resolve anastomotic leakage (5). Loop ileostomy or colostomy is performed for fecal diversion but opinions regarding the preference of these procedures are unclear. Loop ileostomy was favored in the early studies as it led to fewer complications and could be reversed easily (6, 7). However, recent studies have highlighted the high mortality rate of LI (8). Loop colostomy is recommended as LI led to a high incidence of ileus and obstruction. Studies comparing LI and LC in the last decade prefer ileostomy due to comparatively low complication rates. A systematic review reported the risk of dehydration in patients who underwent LI and had previous renal impairment (9). This study was conducted to compare the outcomes of loop ileostomy and

loop colostomy for temporary rectal diversion in cancer patients undergoing rectal resection.

Methodology

A prospective study was conducted in the General Surgery Department of Nishtar Hospital, Multan from June 2024 to November 2024. A total of 150 rectal cancer patients undergoing anterior resection were included in the study. Patients with no ostomy or terminal ostomy and those who underwent emergent cancer surgery were excluded. All patients provided their informed consent. The ethical committee of the hospital approved the study. Patients' data regarding medical history, demographics, operative data, and follow-up data were recorded. Patients were divided into two groups; Group A included 75 patients undergoing loop ileostomy and Group B included 75 patients undergoing loop colostomy. Surgeons chose one of the diversion stomas as per their discretion. Loop ileostomy was done 10 cm proximal to the ileocecal valve and loop colostomy was done transversely. A circular skin incision at the pre-marked location was made and skin excision was performed. Anterior rectus sheath was incised in a cruciate fashion measuring 1.5 x 1.5 cm. The incision of the fascia

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was performed similarly and rectal muscle was divided according to the direction of muscular fibers. The posterior rectal sheath was also incised in cruciate fashion and digital dilation of the abdominal wall defect was performed with three fingers. The bowel was passed through the abdominal wall such that an efferent loop was placed caudally and an afferent loop was placed cranially. Loop Ostomy Bridge was formed by a red rubber catheter and the bowel was fixed by interrupted sutures on subdermal and full-thickness skin. A protrusion of 2.5cm of afferent loop ileostomy limb and 1.5 cm of afferent loop colostomy skin was achieved. All patients were guided about stoma management and care postoperatively.

The primary outcome was to perform a comparison between morbidity outcomes after stoma formation and closure between both procedures. Patients were monitored for acute kidney injury, peristomal skin irritation or hernia and stomal prolapse, ischemia, retraction, or bleeding before closure. After closure, incidence of postoperative ileus, wound infection, or hernia and anastomotic bleeding or leak. Patients were followed up after every 2-4 weeks in OPD after stomal construction and reversal.

All data was analyzed by SPSS version 24. Patient data was calculated as mean ± SD and median± IQR for skewed data. T-test was used to compare continuous data and Fisher’s test compared categorical data. A probability value of 0.05 or less was taken as significant.

Results

A total of 150 patients were included in the analysis. The average age in groups A and B was 65.2 ± 14.3 and 62.8 ± 13.5 years, respectively (p=0.62). Patients were similar with respect to gender (p=0.90), BMI (p=0.39), and ASA classification (p=0.90) in both groups. Stoma closure took 5 ± 6 months in group A and 6 ± 7.1 in group B. Tumor-specific characteristics were also similar between both groups. Patients’ data is shown in Table 1.

Operative and tumor data is shown in Table II. 38 patients (50.7%) had a tumor 0-6 cm. The majority of patients (70.7%) underwent low anterior resection. Laparotomy was performed on 72 patients (96%) to access the surgical site. 66 patients (88%) were closed by staples.

After stomal construction, the incidence of complications between both groups was similar. Overall morbidity occurred in 23 patients (30.6%) in group A and 21 patients (28%) in group B. The parastomal hernia was the most common complication in the study population in 31 patients (20.6%), the difference in both groups was insignificant (20% vs 21.3%) (p=0.78). 2 patients (2.7%) in group A and 3 patients (4%) in group B were readmitted due to stomal complications. The incidence of peristomal skin irritation was significantly higher in group A than in group B (9.4% vs 1.3%) (Table 2).

After the stomal reversal, 4 (8%) in group A and 1 (1.9%) in group B had anastomotic leaks, however, the difference was insignificant (p=0.19). 50 (66.7%) patients in the ileostomy group and 51 (68%) patients in the colostomy group underwent stoma reversal. Complications after reversal were similar with the most common complication being wound infection (14 vs 7.9%) (p=0.53%). No patients died due to stoma-related complications (Table 3).

Table 1: Patients’ data

	Group A	Group B	P value
Average age	65.2 ± 14.3	62.8 ± 13.5	0.62
Gender			0.90
Male	40 (53.4%)	51 (68%)	
Female	35 (46.6%)	24 (32%)	
Average BMI	26.8 ± 6.3	26.2 ± 6.0	0.39
ASA			0.90
I	4 (5.4%)	6 (8%)	
II	48 (64%)	45 (60%)	
III	23 (30.6%)	24 (32%)	
T			0.62
0	44 (58.7%)	37 (49.4%)	
1	3 (4%)	4 (5.4%)	
2	10 (13.4%)	10 (13.3%)	
3	18 (24%)	22 (29.3%)	
4	-	2 (2.7%)	
N			0.95
0	62 (82.7%)	62 (82.7%)	
1	7 (9.4%)	8 (10.6%)	
2	6 (8%)	5 (6.7%)	
M			0.38
0	65 (86.7%)	59 (78.7%)	
1	10 (13.3%)	16 (21.3%)	
Stomal closure	51 (68%)	52 (69.4%)	0.48
Duration of stoma closure	5 ± 6	6 ± 7.1	0.80

Table 2: Operative data

	N (%)
Tumor size	
0-6 cm	38 (50.7%)
Larger than 6-12 cm	22 (29.3%)
Larger than 12-16 cm	15 (20%)
Type of resection	
Anterior	5 (6.7%)
Low anterior	53 (70.7%)
Ultra-low anterior	12 (16%)
Intrasphincteric	5 (6.7%)
Primary access	
Laparotomy	72 (96%)
Laparoscopic assisted	2 (2.7%)
Splenic flexure localization	68 (90.7%)
Anastomosis	
Staples	66 (88%)
Vicryl sutures	9 (12%)

Table 3: Morbidity after stoma construction and reversal

	Group A	Group B	P
Stomal construction			
30-day morbidity	23 (30.6%)	21 (28%)	0.61
Clavien-Dindo classification			0.39
I	4 (5.5%)	2 (2.7%)	
II	-	2 (2.7%)	
IIIa	-	1 (1.3%)	

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IIIb	19 (25.4%)	16 (21.3%)	
AKI	3 (4%)	-	0.09
Prolapse	1 (1.3%)	2 (2.7%)	0.92
Retraction	1 (1.3%)	1 (1.3%)	0.68
Ischemia	-	1 (1.3%)	0.65
Bleeding	-	1 (1.3%)	0.65
Peristoma I skin irritation	7 (9.4%)	1 (1.3%)	0.030
Parastoma I hernia	15 (20%)	16 (21.3%)	0.78
Stomal reversal	N= 50 (66.7%)	N= 51 (68%)	
30-day morbidity	11 (22%)	12 (23.6%)	0.79
Clavien-Dindo classification			0.92
I	-	-	
II	-	-	
IIIa	3 (6%)	3 (5.9%)	
IIIb	8 (16%)	8 (15.7%)	
Wound infection	7 (14%)	4 (7.9%)	0.53
Incisional hernia	2 (4%)	6 (11.8%)	0.20
Anastomo tic leak	4 (8%)	1 (1.9%)	0.19

Discussion

Temporary diversion of rectal anastomosis is a frequent method by ileostomy and colostomy in case of rectal disorders or diseases. The consensus on the most successful method of ostomy in patients with rectal cancer is vague. A meta-analysis comparing loop ileostomy and loop colostomy preferred the former as it showed favorable results in stoma construction.(10) Another meta-analysis, however, reported comparable results of stoma construction and reversal in both techniques.(11)

In the current study, the morbidity and mortality outcomes of loop ileostomy and loop colostomy were compared for stoma construction and reversal. The results indicated that the outcomes were comparable between both procedures. Parastomal hernia was the most common complication in the study population in 31 patients (20.6%), the difference in both groups was insignificant (20% vs 21.3%) ($p=0.78$). This is in contrast to previous studies where this complication was significantly higher in colostomy patients.(12, 13) This may be because we did not include hernias that did not interfere with the quality of life of patients or cause any clinical symptoms. Other reasons could be a method of stoma creation and follow-up protocol. Patients undergoing loop ileostomy had a significantly higher incidence of peristomal skin irritation (9.4%) which may be attributed to chemical dermatitis which is a common condition in LI patients. This condition can be prevented by perioperative care and providing awareness to patients about managing their hygiene and changing their pouches.(14) After stomal creation, the incidence of AKI was higher in the ileostomy group (4%) but the difference was insignificant. This incidence was significantly lower than existing literature which reports a 7-20% rate of AKI in ileostomy patients (15). This can be due to the fact that

we closely monitored our patients postoperatively and prescribed anti-diarrheal drugs.

2 patients (2.7%) in group A and 3 patients (4%) in group B were readmitted due to stomal complications. 50 (66.7%) patients in the ileostomy group and 51 (68%) patients in the colostomy group underwent stoma reversal which is significantly lower than reported by previous studies. Martellucci et al concluded that 1/3rd of ostomy patients with rectal cancer who were 70 years or older were less likely to replace their ostomies as the elderly population has a high incidence of comorbidities which accounts for their hesitance for repeated procedures (16). 36% of our study population belonged to this age group.

Complications after reversal were similar with the most common complication being wound infection (14% vs 7.9%) ($p=0.53$). There was an insignificant difference between the incidence of anastomotic leak (8% vs 1.9%) and none of the patients in both groups had bleeding or ileus. These findings are in line with existing research (17).

Our study has some limitations. We did not assess the peristomal dermatitis in patients through an objective scale due to which the cause for stoma-related skin complications could not be definitely confirmed.

Conclusion

The outcomes of loop ileostomy and loop colostomy for temporary diversion of rectal anastomosis in patients with rectal cancer were comparable. Larger, randomized studies are needed to verify our findings.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-TCL-034/23)

Consent for publication

Approved

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Conflict of interest

The authors declared absence of conflict of interest.

Author Contribution

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Coordination of collaborative efforts.

Study Design, Review of Literature.

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Conception of Study, Development of Research Methodology Design, Study Design, Review of manuscript, final approval of manuscript.

Conception of Study, Final approval of manuscript.

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Data acquisition, analysis.

Coordination of collaborative efforts.

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