

Indications and Complications of Stoma Formations in Emergency Surgery

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Abstract

Introduction: Colorectal cancers are the second leading cause of cancer death in Europe. Colonic emergencies are associated with high morbidity and mortality. The aim of this study was to discuss the ostomy indications, stoma preferences and the early stage results of these operations. **Methods:** The cases who underwent emergency operation were investigated retrospectively. Demographic characteristics, surgical indications, preferred type of stoma, postoperative early stage complications were analyzed. **Results and Conclusion:** As a result, the stoma still maintains its importance in colorectal surgery. Frequencies are preferred to minimize morbidity in emergency surgery procedures. The operations at the right time with the right indications are life-saving.

Keywords: Colorectal surgery, colectomy, emergency, ileostomy

Introduction

Colorectal cancers are the second leading cause of cancer death in Europe. Some of the colorectal surgeries are performed under emergency conditions^[1]. Colonic emergencies are associated with high morbidity and mortality^[2]. Sometimes opening of the stoma may be required for emergency surgery. In the United States of America, more than 130000 stoma operations are performed annually. Colostomy and ileostomies, which are opened due to the cancer, constitute the majority of these procedures^[3]. Although it can generally be applied for obstructed colon masses, it can be performed for many reasons such as mesenteric ischemia, trauma, perianal abscess, complications of inflammatory bowel disease. The preference of loop ileostomy, colostomy and hartmann procedure may vary according to the indication and surgeon. In emergency surgery, the stoma which is opened for sepsis control may be life-saving^[4,5]. The aim of this study was to discuss the ostomy indications, stoma preferences and the early stage results of these operations.

Materials and Method

The cases who underwent emergency operation in the General Surgery Clinic of Haseki Training and Research Hospital between January 2009-March 2016 were investigated retrospectively. Demographic characteristics, surgical indications, preferred type of stoma, postoperative early stage complications were analyzed.

Ethics

Ethics committee approval was not received for this study since it was planned as a retrospective study. However, the study was conducted in accordance with the ethical principles put forward by the World Health Organization's Declaration of Helsinki.

Statistics

Statistical analyses were performed with SPSS version 20 (IBM Corp. in Armonk, NY). Kolmogorov-Smirnov and Shapiro-Wilk tests were used to evaluate the distribution of the data. Descriptive data are presented as frequencies (n) and percentages (%) for categorical variables, and mean with standard deviation (SD) for normally distributed numerical variables, median with interquartile range (IQR) for non-normally distributed numerical variables. Fisher's Exact test was used for comparing categorical variables, Independent-samples T test was used for comparing normally distributed numerical variables, and Mann-Whitney U test was used for comparing non-normally distributed numerical variables between ileostomy and colostomy groups. $p < 0.05$ was considered as statistically significant level.

Results

Table 1: Types of the ostomies

Ostomy types	n (%)
Ileostomies	
Loop ileostomy	33 (61.0)
End ileostomy	7 (13.0)
Double-barrel ileostomy	7 (13.0)

Colostomies	
Loop colostomy	2 (3.7)
End colostomy	5 (9.3)
Total	54 (100.0)

Table 2: Demographics of the patients

Variable	Ileostomy (n=47)	Colostomy (n=7)	p
Age (years)			*0.538
Mean±sd	60.6±15.9	56.6±15.4	
Sex, n (%)			**0.431
Female	23 (48.9)	2 (28.6)	
Male	24 (51.1)	5 (71.4)	

sd: standard deviation

* Independent-samples T test was used.

** Fisher's Exact test was used.

Table 3: Indications of ostomies

Indications	Ileostomy		Colostomy	
	n	%	n	%
Rectum cancer	21	44.7	2	28.6
Leakage after intestinal surgery	6	12.8	0	0.0
Acute abdomen	5	10.6	0	0.0
Colon cancer	4	8.5	0	0.0
Inflammatory bowel disease	2	4.3	0	0.0
Perforated diverticulitis	1	2.1	2	28.6
Iatrogenic intestinal injury	1	2.1	0	0.0
Mesenteric ischemia	1	2.1	0	0.0
Cecal perforation	1	2.1	0	0.0
Ileal resection	1	2.1	0	0.0
Bladder cancer	1	2.1	0	0.0
Ileus	1	2.1	0	0.0
Strangulated umbilical hernia	1	2.1	0	0.0
Familial adenomatosis polyposis coli	1	2.1	0	0.0
Colon resection	0	0.0	2	28.6
Rectovaginal fistula	0	0.0	1	14.3
Total	47	100.0	7	100.0

Table 4: Comparison of stoma related mortality, time to discharge and time interval between formation and closure among the patients with ileostomy and with colostomy

Variable	Ileostomy	Colostomy	p
Stoma related mortality, n (%)	1 (2.1)	0 (0.0)	*>0.999
Time to discharge (day)***	(n=46)	(n=7)	
Median (IQR)	6.0 (6.0-7.0)	6.0 (5.0-8.0)	**0.589
Range	4.0-19.0	2.0-16.0	
Time interval between formation and closure of stoma (month)****	(n=42)	(n=6)	
Median (IQR)	5.0 (3.0-8.0)	4.0 (2.0-9.0)	**0.649
Range	1.0-24.0	2.0-12.0	

IQR: Interquartile range

* Fisher's Exact test was used.

** Mann-Whitney U test was used.

*** One patient with ileostomy died in hospital.

**** The stomas were not closed in 5 patients with ileostomy, and in one patient with colostomy.

Table 5: Comparison of stoma related complications and stoma closure related complications between ileostomy and colostomy groups

Variable	Ileostomy (n=47)	Colostomy (n=7)	*p
Stoma related complications, n (%)			
Bleeding	1 (2.1)	0 (0.0)	>0.999
Wound site infection	0 (0.0)	1 (14.3)	0.130
Intra-abdominal abscess	1 (2.1)	0 (0.0)	>0.999
Stoma closure related complications, n (%)**	(n=42)	(n=6)	
Wound site infection	2 (4.8)	1 (16.7)	0.336
Anastomosis leakage	1 (2.4)	1 (16.7)	0.237
Adhesive bowel obstruction	1 (2.4)	0 (0.0)	>0.999
Incisional hernia	0 (0.0)	1 (16.7)	0.125

* Fisher's Exact test was used.

** The stomas were not closed in 5 patients with ileostomy, and in one patient with colostomy

This comparative surgical study was carried out with 54 patients admitted to the general surgery department with different diagnoses, and underwent stoma surgery. Of the performed ostomies, 47 were ileostomy and 7 were colostomy. End ileostomies and double-barrel ileostomies shared the second place (n=7), while the most performed ostomy type was loop ileostomy (n=33). Besides, there were 2 patients with loop colostomy, and 5 patients with end colostomy (Table 1). The mean age was 60.6±15.9 years in the ileostomy group, and 56.6±15.4 years in the colostomy group; the females were 48.9% of the patients with ileostomy, and 28.6% of the patients with colostomy (Table 2). The three most frequent indications of ileostomies were rectum cancer (44.7%), leakage after intestinal surgery (12.8%) and acute abdominal conditions (10.6%). The leading indications of colostomies were rectum cancer (28.6%), perforated diverticulitis (28.6%) and colon resection (28.6%) (Table 3). However, one patient in ileostomy group died due to ostomy related conditions, there was no death related to ostomy in colostomy group. The median time to discharge was 6.0 days with an IQR of 6.0-7.0 days in ileostomy group, and 6.0 days with an IQR of 5.0-8.0 days in colostomy group. The stomas were not closed in 5 patients with ileostomy, and in one patient with colostomy. The median time interval between formation and closure of stoma was 5.0 months with an IQR of 3.0-8.0 months in ileostomy group, and 4.0 months with an IQR of 2.0-9.0 months in colostomy group. There was no statistically significant difference in these variables among ileostomy and colostomy groups (p>0.999, p=0.589, and p=0.649, respectively) (Table 4).

In this study, 2 stomas developed stoma related complications, one of them (2.1%) was bleeding and the other one (2.1%) was intra-abdominal abscess in patients with ileostomy. Besides, there was only one (14.3%) stoma related complication which was wound site infection in a patient with colostomy. Of the stoma closure related complications, wound site infection was appeared in two patients (4.3%) with ileostomy and one patient (16.7%) with colostomy, anastomosis leakage was seen in one patient in both groups, adhesive bowel obstruction was observed in one patient in ileostomy group, and an incisional hernia occurred in one patient in colostomy group. The occurrence of the stoma related and the stoma closure related complications were not statistically significantly different among the patients with ileostomy and with colostomy (Table 5).

Discussion

For emergency surgeries, ileostomy or colostomy may be preferred. Approximately half of the stomas are opened under emergency conditions^[6]. In their study, Banaszkiwicz et al. analyzed 1710 patients who were operated for colorectal cancer over a 20-year period and they reported that stoma was formed in one third of the patients. Furthermore; in this study, 230 cases have undergone emergency surgery and it has been reported that the patients who have been operated under emergency conditions have had a higher rate of stomata opening than the patients operated under elective conditions^[5].

Qureshi et al. in a study on cases who had emergency and elective stoma creation due to colorectal surgery reported that the surgeons preferred ileostomy under elective conditions whereas colostomy was the most common procedure in emergency surgery. In this study, diverticular perforation and colon adenocarcinoma are shown as the most common indications for emergency stoma^[4]. Richardson et al, in their study reported that definitive stoma was mostly performed in patients with high stage rectal cancer^[7]. Some temporarily planned stomas are not closed due to complications or comorbidities. This may sometimes affect the quality of life of patients with stoma and may cause additional problems.

One of the most feared complications in colorectal surgery is the anastomotic leakage. Anastomosis after emergency surgeries shows a higher rate of anastomotic leakage than elective surgery^[8]. Decompressive stoma during emergency surgery is a bridge to elective surgery and also decreases morbidity and mortality in patients with high risk of anastomotic leakage^[9]. For all these reasons, surgeons are not prejudiced about stoma opening in emergency operations.

Serious complications such as stoma necrosis, dermatitis, stoma retraction, stoma leakage, prolonged ileus, high output with dehydration can be seen in patients with stomata^[10]. Overall, the rates of complication of stoma vary between 21-70%^[6]. Long-term complication rates increase to 58% in colostomy and up to 76% in ileostomy^[11]. This rate is higher in the stomata that are urgently opened. Stoma complications may be severe enough to cause mortality or may affect the quality of life of the patient in the long term^[2,4]. Pengelly et al. reported the overall complication rate as 25%. Loop colostomy was the highest complication rate with 38% and the lowest complication rate was determined as 16% in end ileostomy^[6]. The most common complications of colostomies were parastomal hernia and retraction, while the most common complications of ileostomies were hernia, retraction and small bowel obstruction^[6]. Ambe et al., in their study, evaluated stoma related complications as early period (first 30 days after surgery) and late period complications and reported that skin irritation, erosion, and ulceration were the most common early stage complication with the rate of 25-34% whereas stoma prolapse was the most common late complication with the rate of 8-75%^[12]. The information about stoma creation mortality rates in the literature is insufficient. Pengelly et al. reported the mortality rate due to the stoma complications as 8%^[6]. Stoma related mortality rate in our study was 2.1%.

Although there are publications in the literature reporting that the complication rates are higher after emergency stomata, Pengelly et al. stated that despite the complication rate was high in the emergency stomata group, there was a statistical difference for

necrosis^[6]. In a meta-analysis by Guenaga et al., it was concluded that there was no relationship between stoma type and complication rates in cases with loop stoma^[13]. In our study wound site infection complication rates were seen more common.

The limitations of this study are that it is a single-centered and retrospective study. However, we believe that emergency stoma procedures will contribute to the literature as number and variety.

Conclusion

As a result, the stoma still maintains its importance in colorectal surgery. Frequencies are preferred to minimize morbidity in emergency surgery procedures. The operations at the right time with the right indications are life-saving.

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