

A Study of Complications after Ileostomy Reversal in a Tertiary Care Center

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Abstract

Background: Closure of a loop ileostomy or colostomy is relatively a simple procedure although many studies have demonstrated high morbidity rates following it. Methods to reduce number of complications are investigated. The aim of this study to determine complications after ileostomy closure.

Objectives: To study the incidence of complications of ileostomy reversal and also the potential risk factors leading to complications after ileostomy reversal.

Study design: Prospective cohort study.

Methods: Data from 108 patients who underwent closure of stoma from December 2019 to August 2021 at Hamidiya Hospital, Bhopal (MP) were collected including demographics, causes of ileostomy formation, additional diseases, time from creation to closure of stoma, duration of operation, postop complications and duration of stay after surgery.

Results: Complications occurred in 55 patients at different follow up periods in total 108 patients undergoing stoma reversal of variable age. 25% (n = 14) of patients had surgical site infection, malnourishment 7.4% (n=8), incisional hernia 6.5% (n=7), diarrhoea 5.6% (n=6), bowel obstruction 4.6% (n=5), anastomotic leak 0.9% (n=1). Most common potential risk factors after complications were low Hb, critical status of the patient, sunken stoma and comorbidities. 2 patients died (1.8%).

Conclusion: Meticulous care and attention to advanced techniques and methods, post operative education regarding stoma care and its resumption and multidisciplinary follow ups reduces post op stoma creation or closure complications.

Keywords: stoma closure; complications; reversal; follow up

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Introduction

A loop ileostomy is one of the most common techniques used in laparotomy

surgery to establish a reversible fecal diversion and bypass bowel in order to

protect downstream bowel anastomosis. Considered as common procedure in response to a diverse intestinal pathology be it traumatic or non-traumatic, the formation of the stoma could be considered one of the fundamental part of larger surgery but, it is the one which features a mammoth effects on the patient's physical status but also affects the patient psychologically.

The morbidities associated with loop ileostomy reversal include surgical site infections, post-operative adhesions, leak at stoma closure site, bowel perforation and peritonitis, malnutrition and incisional hernia .[1]

Risk factors for the complications after ileostomy closure are male gender, age, surgical site infection, longer time period from creation to closure, operation for disease with significant peritoneal contamination, type of ileostomy, general condition of the patient and small bowel resection. Loop ileostomies reversal is recommended within 8 to 12 weeks after the primary surgery for stoma creation, in order to obtain adequate healing and avoiding extended presence of loop ileostomy. Reasons of delayed closure of stoma including postoperative adjuvant chemotherapy, nonsurgical complications, symptomatic anastomotic leakage and small bowel obstruction as well as administrative obstacles [2].

The objective for this prospective study is to detect potential patient related as well as surgery related risk factors for reoperation in ileostomy reversal. Therefore the patient characteristics as well as the intraoperative factors will be noted and the patients will be followed up for 3 months after surgery to identify late complications of stoma closure.

Methods

This prospective cohort study was conducted at an academic, tertiary care center. All patients who underwent stoma reversal during the study period of 21

months (from 1st december 2019 to 31st August 2021) were included in the study after taking informed consent from the patient and their attendees. Demographics, causes of ileostomy formation, additional diseases, time from creation to closure of stoma, duration of operation, postop complications and duration of stay after surgery were collected during the admission and at follow up of the patient.

Closure of loop ileostomy was carried out under general anaesthesia. Systemic prophylactic antibiotics were administered to all patients prior to the operation. Hand sewn anastomosis without a short bowel resection was performed. Skin edges of stoma were excised. Abdominal wall was closed in 2 layers, rectus with vicryl 2-0 and skin with ethilon 2-0. Patients and their attenders were regularly called on follow up and their follow up advice and further plans and success or failure or complication of ileostomy reversal were noted carefully in the pretested proforma.

Complications were assessed upto 3rd follow up of the patient. Deaths were defined as deaths within 30 days of procedure or during same

Statistical analysis: The collected data were transformed into variables, coded and entered in Microsoft Excel. Data were analyzed and statistically evaluated using SPSS-PC-25 version. Quantitative data was expressed in mean±standard deviation and depends on normality distribution difference between two comparable groups were tested by student's t-test (unpaired) or Mann Whitney 'U' test. Qualitative data were expressed in percentage and statistical differences between the proportions were tested by chi square test or Fisher's exact test. P' value less than 0.05 was considered statistically significant.

Results

This study is carried out in Hamidia hospital Bhopal over a period from approval of ethical committee September,

2019 till august,2021 during this period, 108 ileostomy and colostomy were reversed out of which 39 cases had complications associated with multiple risk factors.

Mean duration after primary surgery was 4.68 ± 1.50 months. Around 12.9% patients presented with surgical site infections (n=14) as stoma reversal complication while 7.4% patients were malnourished. Around 4.6% patients presented early with post op small bowel obstruction and only 1% with anastomotic leak. Patients presented with incisional hernia as late complication of stoma reversal which were around 6.5% (n=7).

Study showed male gender (40.6%) being more commonly affected with complications after stoma reversal than

female gender (28.2%). Complication was more commonly seen in subjects with low haemoglobin (77.8%) compared to those with normal haemoglobin level (27.8%). This difference was found statistically significant. Complications were more commonly observed in those patients in which if stoma was sunken (71.4%) or malnourished (100%) compare to those patients in which stoma was healthy and functional (32.3%). This association was found statistically non-significant (p value = 0.01)

In critical patients complications were observed in 78.6% patients while in non-critical patients complications were observed in 29.8% patients. The difference was found statistically significant (p value <0.001).

Table 1: Gender wise distribution:

GENDER	COMPLICATIONS	
	ABSENT	PRESENT
MALE	41 (59.4%)	28 (40.6%)
FEMALE	28 (71.8%)	11 (28.2%)

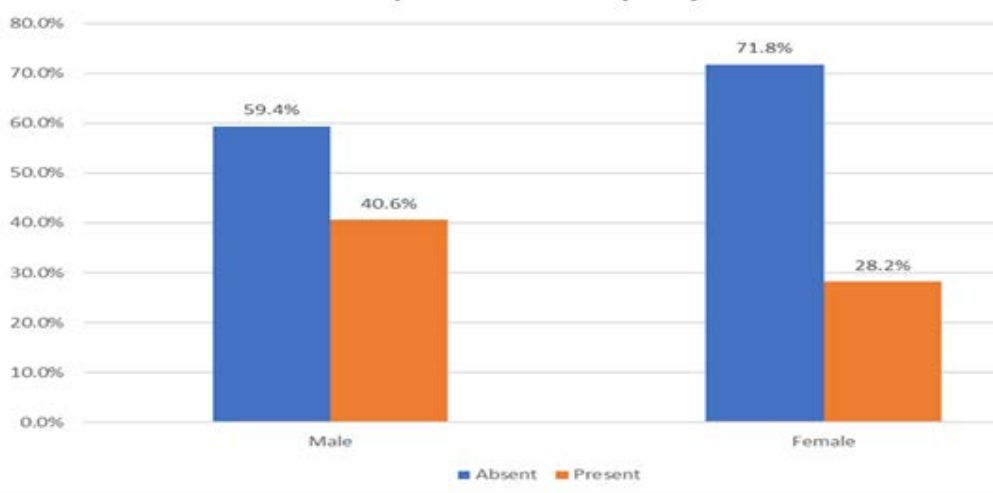


Figure 1: Association of gender with development of complications

Table 2: hemoglobin levels

HB LEVEL	COMPLICATIONS		P VALUE
	ABSENT	PRESENT	
LOW Hb	4 (22.2%)	14 (77.8%)	<0.001
WNL	65 (72.2%)	25 (27.8%)	

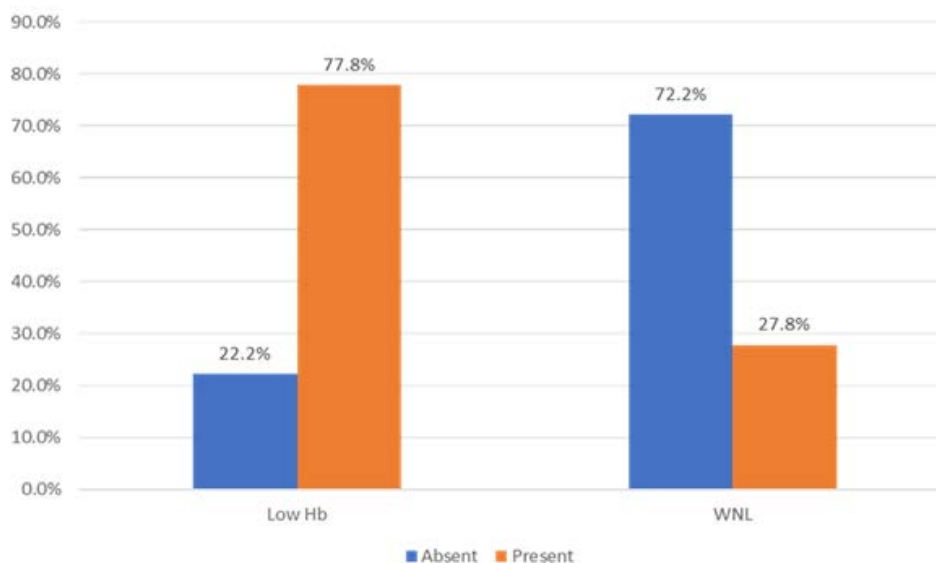


Figure 2: association of low Hb with development of complication.

Table 3: Examination findings:

Significant finding on examination	Complications		P value
	Absent	Present	
Stoma healthy and functional	67 (67.7%)	32 (32.3%)	=0.001
Stoma sunkened	2 (28.6%)	5 (71.4%)	
Malnourished	0	2 (100.0%)	

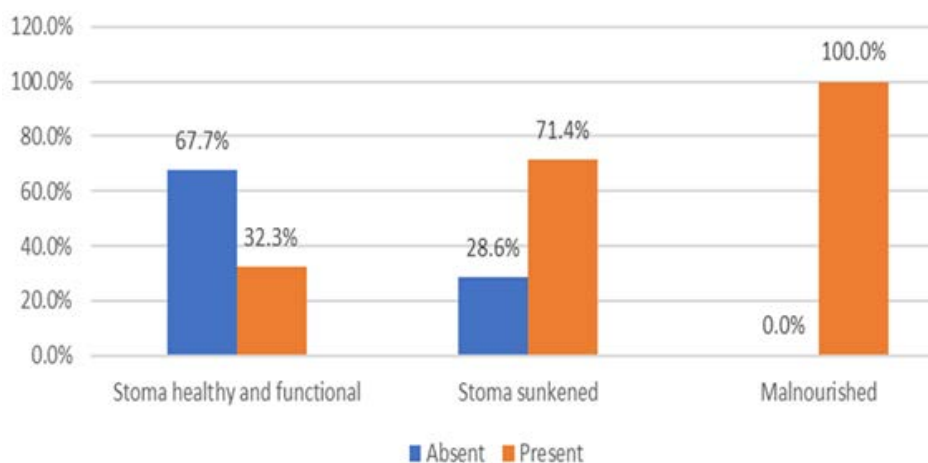


Figure 3: Graphical representation of clinical findings.

Table 4: Condition of patients with complication status

Condition	Complications		P value
	Absent	Present	
Critical	3 (21.4%)	11 (78.6%)	<0.001
Not critical	66 (70.2%)	28 (29.8%)	

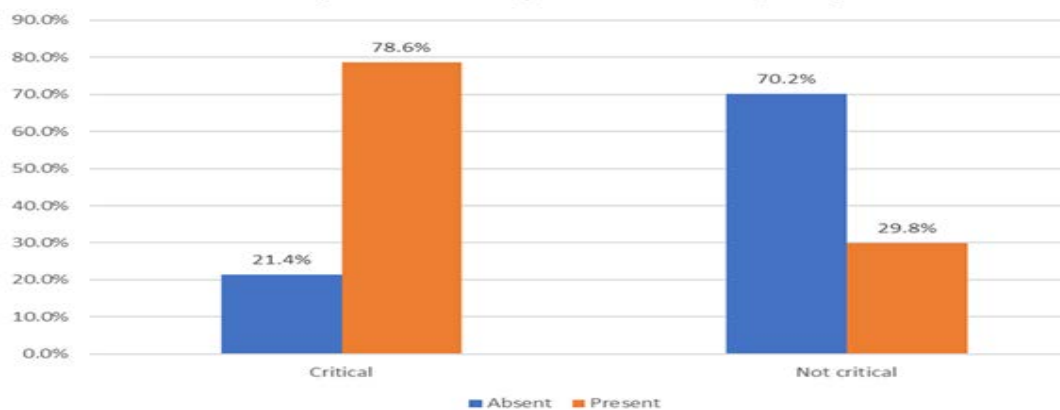


Figure 4: Condition of patients with complication status

Table 5: Complications after closure of stoma.

Complications after stoma closure	At follow up 1	At follow up 2	At follow up 3
Abdominal wall cellulitis	1 (0.9%)		
Death	2 (1.85%)		
Diarrhoea	5 (4.6%)	1 (0.9%)	
Incisional hernia	3 (2.8%)	3 (2.8%)	1 (0.9%)
Malnourished	3 (2.8%)	5 (4.6%)	
Pneumonia	4 (3.7%)	1 (0.9%)	
poor nutrition	1 (0.9%)		
Re exploration done due to obstruction after closure	5 (4.6%)		
Re exploration done after closure due to leak	1 (0.9%)		
Surgical site infection	13 (12.0%)	1 (0.9%)	
WNL	70 (64.8%)	82 (75.9%)	107 (99.1%)

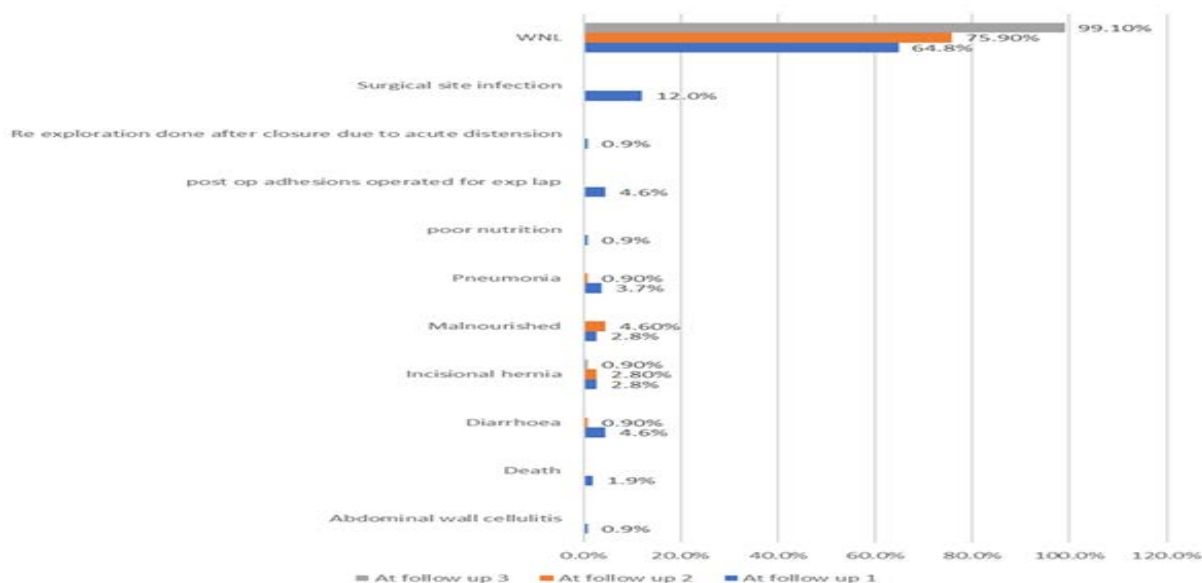


Figure 5: Complications after closure of stoma

Discussion

Creation of a temporary diverting loop ileostomy is a surgical tool to divert stool and thereby defunctioning distal anastomosis [4]. Loop ileostomy is used in salvage surgery after a complication and as a palliative measure [3]. However, second operation i.e. ileostomy closure has its own potential risk of morbidity and mortality.

Kaidar person et al. [5] reviewed 26 studies evaluating the complications of loop ileostomy closure and reported rates for wound infections 0-18.3%, small bowel obstruction 0-15%, and anastomotic leak of 0-8%. This data is compatible with our study. It is often declared that reversal of loop ileostomy is a simple and safe procedure. However our review of literature discovered studies which demonstrated high morbidity rates following loop ileostomy closure. Studies exists which says ileostomy closure is associated with low rate of serious complications according to Clavien – Dindo [6] and can be done as a daycare procedure.

In the literature, other significant risk factors for complications after ileostomy reversal are described, e.g. male gender and surgical site infections (independent risk factors for the development of wound infections) [4], longer time from creation to closure, operation for diverticular disease with significant peritoneal contamination [7,8], age, race, type of ileostomy (end vs. loop) [9,10], general condition of the patient [10], and small bowel resection [8]. The increased time from creation to closure of the stoma was not the significant risk factor in our study.

The rate of postoperative complications was lower in the malignancy group. The benign disease group (necrotizing pancreatitis, colon fistula, diverticulitis, small bowel perforation) is associated with a higher incidence of adhesions and a difficult anatomy, therefore reducing the

chance of safe ileostomy closure. In our study Typhoid perforation of small bowel was the most common pathology, which led to overall stoma formation in 40.7% of the cases. Total patients that presented with peritonitis accounted for more than 60% of cases.

The causes of persistence of typhoid fever in our country are still inadequate supply of safe drinking water and poor sanitation. Moreover the patients of this disease are usually from the lower socio-economic status, so they cannot afford stoma appliances and are difficult to teach stoma care also. These things make this group more vulnerable to suffer from stoma related complication.

Incidences of pneumonia after a stoma reversal is rare, but due to associated risk factors like poor nutrition, repeat surgeries and anaesthesia inductions, poor immunity, poor general conditions and pre operative chest complications like h/o of asthma, TB etc. In our study around n = 5 (4.6%) presented with pneumonia out of which n=4 (3.7%) presented during their first follow up and n=1 during their second follow up. The one who presented during second follow up had presentation of poor nutrition during his first follow up hence it refers to be the risk factor for the pneumonia in that patient. Remaining 4 were immunocompromised due to their history of tuberculosis and diabetes mellitus type 2.

The patients in the study by Gooszen et al. had a median age of 63 years and had one of the higher complication rates at 31%. Phang et al. [10] describe a complication rate of 24.5% despite a median age in their study of 36. Our study is not adequately powered to identify small differences in outcome between comparable groups; however, several effects were noted. Other complications like enterocutaneous fistula, ileus, keloid scarring, TIA and cardiac complications were absent in the study subjects.

Conclusion

Closure of a loop ileostomy is associated with a low mortality, but a relatively high rate of morbidity. More complications were seen in patients who had low Hb, critical GC and sunkened stoma.

Meticulous care and attention to advanced techniques and methods will reduce the post operative stoma creation or closure complications. Post operative education regarding stoma care and its resumption of its normal activity plays a vital role in reducing post operative complications. Multidisciplinary follow ups also helps in seeking out complications and associated morbidities at an earlier time associated with these procedures.

The limitation of this study is probably the small size of cohorts and follow up period of only 3 months was relatively short. However, a large multi-center trial needs to be undertaken to further confirm the findings of our study.

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Ethical clearance: The approval was obtained from the Institutional Ethical Committee of the Gandhi Medical College, Bhopal (Letter No. 543/MC/IEC/2020; dated 02/01/2020)

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