

Frequency of Complications in Patients Undergoing Temporary Ileostomy at a Tertiary Care Hospital

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ABSTRACT

Objective: To determine the frequency of complications in patients undergoing temporary ileostomy.

Study Design: Prospective observational study.

Place & Duration of Study: Department of Surgery, Combined Military Hospitals, Rawalpindi and Peshawar, Pakistan, from Oct 2022 to Sep 2025.

Methodology: A total of 295 patients, aged 13 to 80 years, undergoing temporary ileostomy were included, regardless of gender. Patients with a history of prior abdominal surgeries or metastatic colorectal malignancies were excluded. Postoperatively, patients were monitored during their hospital stay, with initial assessment on the first postoperative day to detect hemorrhage and stomal necrosis. A subsequent evaluation on the seventh postoperative day was conducted to identify complications such as retraction, stenosis, prolapse, and high-output fistula. Thereafter, patients were followed in the outpatient department at 15-day intervals for a period of three months or until stoma reversal, to document any delayed complications.

Results: The frequency of complications among patients undergoing temporary ileostomy was as follows: surgical site infection (SSI) occurred in 45 patients (15.25%), peristomal skin changes in 33(11.19%), stoma prolapse in 37(12.54%), bleeding in 19(6.44%), necrosis in 21(7.12%), retraction in 24(8.14%), and high-output fistula in 8 patients (2.71%).

Conclusion: Surgical site infection emerged as the most frequently encountered complication in patients undergoing temporary ileostomy.

Keywords: Hemorrhage, Ileostomy, Surgical Site Infection, Surgical Stoma.

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INTRODUCTION

The global prevalence of stoma formation has increased steadily over recent years. It is estimated that nearly one million individuals in the United States are living with stomas, with an estimated 16,000 new procedures performed annually.¹ In Pakistan, the burden of ostomies is substantial, affecting over one million individuals, and continues to grow at an estimated rate of 100,000 additional cases annually.² Complications related to stoma formation have been reported in approximately 21% to 70% of patients.³

An ileostomy involves the surgical diversion of the small intestine to the anterior abdominal wall and it diverts fecal flow away from a distal anastomosis or obstructed bowel segment, thereby mitigating the risk of anastomotic leakage, intra-abdominal sepsis and other postoperative complications.⁴ Temporary ileostomies are frequently created to protect ileocolic

or colorectal anastomoses.⁵ In cases of perforation peritonitis, typhoid enteric perforation as the most prevalent etiology, followed by tuberculous involvement and blunt abdominal trauma.⁶

While ileostomy remains a lifesaving surgical intervention, it has a spectrum of potential complications.⁷ The incidence of these complications demonstrates considerable variation across institutions due to variability in surgical expertise and perioperative protocols.⁸ Additionally, the patient's functional status and quality of life post-surgery can significantly alter post operative outcomes of ileostomy.⁹ Complications due to temporary ileostomy are associated with poor prognosis and in many cases require re-exploration to look for underlying cause.¹⁰

However, there is very little available regarding frequency of different complications in our clinical set-up. The high morbidity associated with ileostomies underscores the urgent need to identify factors that predict complications and guide safer postoperative management. Keeping this perspective in mind, the study was conducted to determine frequency of

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complications in patients undergoing temporary ileostomy.

METHODOLOGY

This prospective observational study was conducted at General Surgery units of Combined Military Hospital Rawalpindi from Oct 2022 to Oct 2023 and General Surgery unit of Combined Military Hospital Peshawar from Sep 2023 to Sep 2025. Ethical permission was sought from the Institutional Ethical Review Committees prior to commencement of study (CMH Rwp ERC No 321 dated 9 Sept 2022 and CMH Psc ERC No 299/23 dated 8 Sept 2023).

Inclusion Criteria: All patients irrespective of gender, between 13 to 80 years age undergoing temporary ileostomy due to typhoid perforation, tuberculous intestine, appendiceal perforation, colonic perforation, trauma or obstruction diagnosed clinically and radiologically were included.

Exclusion Criteria: Patients with previous abdominal surgeries and with metastatic colorectal tumors were excluded.

The initial sample size of 255 was calculated using the OpenEpi online sample size calculator, based on an anticipated stoma complication rate of 21%.⁴ To account for potential dropouts, the sample size was increased to 295. A non-probability consecutive sampling technique was employed to collect data.

All patients presenting with acute abdominal conditions necessitating emergency laparotomy were thoroughly evaluated and optimized prior to surgery. The nature of the operative procedure was explained in detail to both patients and their attendants. Informed written consent specifically addressing stoma creation was duly obtained and patient demographic information (name, age, gender, BMI) was recorded. Initial preoperative management included aggressive fluid resuscitation with isotonic crystalloids, nasogastric decompression to alleviate bowel distension and urinary catheterization to ensure accurate monitoring of urine output. Empirical broad-spectrum antimicrobial therapy, primarily third-generation cephalosporins, was administered, along with analgesia as clinically indicated. A detailed pre-anesthesia assessment was done in all patients and all necessary laboratory and radiological investigations were collected.

Under general anaesthesia, all patients underwent exploratory laparotomy with ileostomy

creation. All surgeries were performed by a consultant general surgery who had at least 5 or more years of post-fellowship experience. Intraoperative findings including the anatomical site, number and dimensions of bowel perforations; the degree of intraperitoneal contamination; the condition of the bowel loops and mesentery; and the presence or absence of regional lymphadenopathy were recorded. Copious peritoneal lavage with warm saline was performed in all cases to minimize the risk of postoperative sepsis. All resected or biopsied tissues were subjected to histopathological examination.

Postoperatively, patients were monitored closely as per our hospital protocols and their clinical progress was documented. Post operative examination was conducted on first post operative day for hemorrhage and necrosis. Necrosis of the stoma was characterized by a sustained dark or discolored appearance of the ileostomy that remained unchanged despite the subsidence of postoperative edema. Examination was conducted on 7th post operative day to assess for stoma retraction, identified when the stoma was found more than 5 cm below the skin surface; stoma prolapse, noted when bowel protrusion through the stoma exceeded 5 cm; stoma stenosis, indicated by narrowing at the stoma site; and high-output fistula, defined by an effluent volume exceeding 1500 mL per day. The stoma was classified as nonfunctional when there was an absence of fecal output for a period exceeding three days postoperatively. Patients were followed up in the outpatient department at fifteen-day intervals for a duration of three months until stoma reversal, with each visit aimed at monitoring for any potential complication. Patient flow is shown in Figure-1.

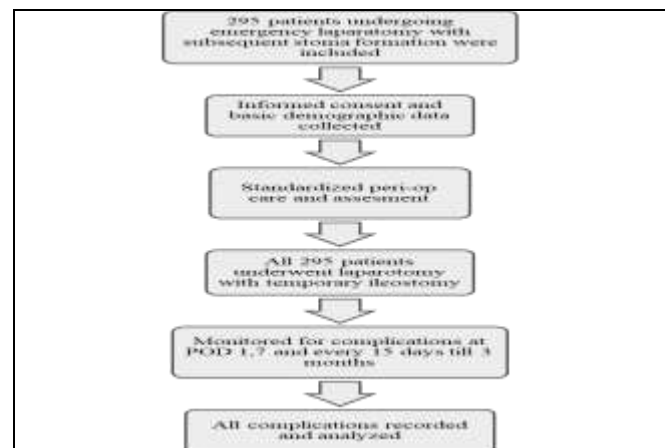


Figure: Patient Flow Diagram (n=295)

Data was analysed using Statistical Package for Social Sciences (SPSS) version 25. Normality of data was checked by Shapiro-Wilk test. Continuous variables such as age and BMI were not normally distributed and summarized as median (IQR). Categorical variables like gender, causes and complications were expressed as frequency and percentage. Data was stratified for age, gender, BMI and causes. Chi-square test was applied to compare groups for complications. A p -value ≤ 0.05 was taken as significant.

RESULTS

In the final analysis, 295 patients were included. Age range in this study was from 13 to 80 years with median age of 52.00 (21) years. Majority of the patients ($n=203$, 68.81%) were between 46 to 80 years. Out of the 295 patients, 186(63.05%) were male and 109(36.95%) were female, with a male to female ratio of 1.7:1. Median BMI was 27.00 (4) kg/m².

Table-I: Demographic Characteristics of Participants (n=295)

Variable	Value n (%)	Range
Age in years – median (IQR)	52.00 (21)	23-75
BMI in kg/m ² - median (IQR)	27.00 (4)	22-34
Gender		
Males	186(63.05%)	-
Females	109(36.95%)	-

*BMI= Body mass index

Majority of patients in this study had perforation due to enteric fever (43.39%). Distribution of patients according to diagnosis is shown in Table-II.

Table-II: Distribution of Patients according to Diagnosis (n=295)

Diagnosis	n (%)
Typhoid perforation	128(43.39%)
Tuberculous intestine	97(32.88%)
Appendiceal perforation	06(2.03%)
Colonic perforation	05(1.69%)
Intestinal obstruction	59(20%)

In our study, frequencies of complications in patients undergoing temporary ileostomy were found to be as follows; SSI was found in 45(15.25%) patients, skin changes in 33(11.19%), prolapse in 37(12.54%), bleeding in 19(6.44%), necrosis in 21(7.12%), retraction in 24(8.14%) and fistula in 08(2.71%) patients, as shown in Table-III.

Association of complications with respect to age, gender, BMI and diagnosis was done, and stratified

groups were compared as shown in Table-IV. Overall, age > 45 years was significantly associated with a higher frequency of surgical site infection, while BMI >25 kg/m² showed a strong association with stoma retraction. Gender did not demonstrate a significant relationship with any complication.

Table-III: Frequency of Complications in Patients undergoing Temporary Ileostomy (n=295)

Complications	n (%)
SSI	
Yes	45(15.25%)
No	250(84.75%)
Skin changes	
Yes	33(11.19%)
No	262(88.81%)
Prolapse	
Yes	37(12.54%)
No	258(87.46%)
Bleeding	
Yes	19(6.44%)
No	276(93.56%)
Necrosis	
Yes	21(7.12%)
No	274(92.88%)
Retraction	
Yes	24(8.14%)
No	271(91.86%)
Fistula	
Yes	08(2.71%)
No	287(97.29%)

*SSI= Surgical site infection

DISCUSSION

In this study, enteric perforation was the most common indication and surgical site infection, prolapse and skin changes were the most frequent complications. Older age, higher BMI and underlying diagnosis showed significant associations with complications. Although the creation of intestinal stoma is often a lifesaving intervention, improper construction of the stoma may complicate or delay definitive surgical management and, in severe cases, result in fatal outcomes.¹¹

One local study showed that common post ileostomy complications include surgical site infection (occurred in 8% of patients who had undergone ileostomy procedure), wound dehiscence (6%), small bowel obstruction (5%), and anastomotic leak (1%).¹² In another study conducted locally the frequency of ileostomy complications were skin excoriation 19.4%, wound infection 13%, non-functioning stoma 11.9%, prolapsed and stenosis 6%, retraction 4.7%, high output fistula 3.5%, parastomal hernia 2.3% and hemorrhage 1.1%.¹³

Postoperative infections represent a frequent early complication, with an incidence approaching 30%.¹⁴ Stoma prolapse is observed in approximately 3% of ileostomies and may occur in up to 10% of colostomies.¹⁵ Stomal prolapse has been associated

Patients Undergoing Temporary Ileostomy

Table-IV: Association of Complications with Respect to Age, Gender, BMI and Diagnosis (n=295)

Parameter		SSI			Skin changes			Retraction			Prolapse			Bleeding		
		Yes (n=45) n (%)	No (n=250) n (%)	p value	Yes (n=33) n (%)	No (n=262) n (%)	p value	Yes (n=24) n (%)	No (n=271) n (%)	p value	Yes (n=37) n (%)	No (n=258) n (%)	p value	Yes (n=19) n (%)	No (n=276) n (%)	p value
Age (years)	13-45	08 (8.70%)	84 (91.30%)	0.035	07 (7.61%)	85 (92.39%)	0.189	12 (13.04%)	80 (86.96%)	0.038	13 (14.13%)	79 (85.87%)	0.579	05 (5.43%)	87 (94.57%)	0.636
	46-80	37 (18.23%)	166(81.77%)		26 (12.81%)	177 (87.19%)		12 (5.91%)	191 (94.09%)		24 (11.82%)	179 (88.18%)		14 (6.90%)	189 (93.10%)	
Gender	Male	29 (15.59%)	157(84.41%)	0.833	19 (10.22%)	167 (89.78%)	0.489	16 (8.60%)	170 (91.40%)	0.702	25 (13.44%)	161 (86.56%)	0.543	10 (5.38%)	176 (94.62%)	0.331
	Female	16 (14.68%)	93 (85.32%)		14 (12.84%)	95 (87.16%)		08 (7.34%)	101 (92.66%)		12 (11.01%)	97 (88.99%)		09 (8.26%)	100 (91.74%)	
BMI (kg/m2)	≤25	12 (10.26%)	95 (89.74%)	0.145	14 (11.97%)	93 (88.03%)	0.731	01 (0.85%)	106 (99.15%)	0.0002	16 (13.68%)	91 (86.32%)	0.634	07 (5.98%)	100 (94.02%)	0.957
	>25	33 (18.54%)	155(81.46%)		19 (10.67%)	169 (89.33%)		23 (12.92%)	165 (87.08%)		21 (11.80%)	167 (88.20%)		12 (6.74%)	176 (93.26%)	
Diagnosis	Typhoid perforation	10 (7.81%)	118(92.19%)	0.024	17 (13.28%)	111 (86.72%)	0.138	07 (5.79%)	121 (94.21%)	0.476	20 (15.62%)	108 (84.38%)	0.022	08 (6.25%)	120 (93.75%)	0.724
	Tuberculous intestine	20 (20.62%)	77 (79.38%)		13 (13.40%)	84 (86.60%)		09 (9.28%)	88 (90.72%)		04 (4.12%)	93 (95.88%)		05 (5.15%)	92 (94.85%)	
	Appendiceal perforation	01 (16.67%)	05 (83.33%)		01 (16.67%)	05 (83.33%)		01 (16.67%)	05 (83.33%)		01 (16.67%)	05 (83.33%)		01 (16.67%)	05 (83.33%)	
	Colonic perforation	02 (40.00%)	03 (60.00%)		01 (20.00%)	04 (80.00%)		00 (0.00%)	05 (100.00%)		00 (0.00%)	05 (100.00%)		00 (0.00%)	05 (100.00%)	
	Intestinal obstruction	12 (20.33%)	47 (79.67%)		01 (1.69%)	58 (98.31%)		07 (11.86%)	52 (88.14%)		12 (20.33%)	47 (79.67%)		05 (8.47%)	54 (91.53%)	

*SSI= Surgical site infection, BMI = Body mass index

with several risk factors, including obesity, elevated intra-abdominal pressure, and suboptimal surgical technique.¹⁶ Stenosis, reported in 2–15% of cases, may arise at any stage of the postoperative course.¹⁷ Risk factors for the development of strictures and stenosis include ischemia, necrosis, retraction, or fistula formation. These features are frequently observed in patients with Crohn's disease.

In a separate study evaluating ileostomy-related complications, surgical complications were reported in 46% of cases, with stoma retraction in 25%, peristomal sepsis in 12.5%, and parastomal hernia in 8.1%.¹⁸ D'Ambrosio *et al.* highlighted that peristomal skin complications (PSCs) remain a significant clinical concern among individuals with stomas, with the most prevalent manifestations including erythema, papular eruptions, epidermal erosions, ulcerative lesions, and vesiculation.¹⁸ Reported prevalence rates of PSCs vary widely in the literature, ranging from 36.3% to 73.4%.

Duarte *et al.* reported that stoma retraction is usually associated with 11% to 24%, stoma obstruction in 6% to 26%, stoma prolapse in 3% whereas parastomal hernia in 1.3% to 6.7% of all ileostomies.¹⁹ Latif A *et al.* found that skin excoriation (25.3%) and retraction (6.7%) were notable complications.²⁰ Infectious processes and bowel perforations were the predominant indications, leading to ileostomy formation in 30.8% of cases and requiring exteriorization of the affected segment. Psychosocial morbidity, including depression, social isolation, and marital breakdown, affected 16.0% of patients. Three mortalities due to septicemia occurred, all linked to delayed presentation.

Focused perioperative protocols may help reduce early stoma-related morbidity. Timely recognition and prompt management of complications is essential to optimize postoperative outcomes. A coordinated, multidisciplinary approach incorporating preoperative education, structured postoperative follow-up and dedicated stoma care is vital to optimizing outcomes and preserving patient quality of life.

LIMITATIONS OF STUDY

Our study had certain limitations, including its restriction to two military centers, which may limit generalizability, and a relatively short follow-up period capped at three months or stoma reversal.

CONCLUSION

Ileostomy, while often essential, is associated with notable postoperative morbidity. In this study, the most common temporary ileostomy complications were SSI (15%), stoma prolapse (12.5%), and peristomal skin changes (11%).

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

SA & HS: Data acquisition, data analysis, critical review, approval of the final version to be published.

SS & SA: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

ARR & MS: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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