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Original Research Article

Early Postoperative Outcomes of Temporary Intestinal Stoma Reversal Surgery

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Abstract: *Temporary intestinal stoma closure is standard but can carry notable short-term morbidity. Early postoperative complications directly affect recovery, hospital stay, and costs. Robust local data can guide perioperative optimization.* ***Objective:*** *To determine the frequency of early postoperative outcomes after temporary intestinal stoma reversal surgery.* ***Methodology:*** *Three hundred ninety-six patients aged 20 to 60 years of either gender scheduled for temporary stoma reversal were enrolled for this study. Patients with diabetes or gastrointestinal carcinomas were omitted. A single experienced surgeon performed all reversal procedures. Patients were assessed within seven days postoperatively for complications such as surgical site infection, wound, small bowel obstruction, and anastomotic leak.* ***Results:*** *The mean age of the patients in this study was 41.60 ± 11.86 years, with male patients 225 (56.8%). The indications for the initial stoma were enteric perforation 215 (54.3%), trauma 131 (33.1%), and abdominal TB 50 (12.6%). The postop complications were surgical site infection 97 (24.5%), wound dehiscence 29 (7.3%), small bowel obstruction 27 (6.8%), and anastomotic leak 13 (3.3%).* ***Conclusion:*** *Early postoperative outcomes after temporary intestinal stoma reversal surgery were surgical site infection (24.5%), wound dehiscence (7.3%), small bowel obstruction (6.8%), and anastomotic leak (3.3%).*

Keywords: Stoma Reversal, Postoperative Complications, Surgical Site Infection, Anastomotic Leak, Intestinal Stoma

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Introduction

A temporary diverting ileostomy is often created to safeguard low colorectal or ileorectal anastomoses. While they do not eliminate anastomotic leaks, they can reduce related morbidity, including sepsis, impaired neorectal function, and cancer recurrence. Loop ileostomies are more common than loop colostomies because of their reduced bulkiness, decreased risk of prolapse, and fewer complications during reversal (1-3). Loop ileostomy closure has been associated with a morbidity incidence of 17.3% as well as a mortality rate of 0.4%. The most common difficulties related to ileostomy closure are wound infection, affecting 5% of cases, and small bowel obstruction, occurring in 7.2% of instances (4).

Smoking is another risk factor for wound infection. A temporary colostomy is indicated for instances of perforations of the left colon. Nearly 20,000 new gastrointestinal stomas are created every year, with one in five formed in emergencies (5). Emergency stoma recipients exhibit increased incidences of stoma-associated complications, which include skin excoriation, stomal herniae, and stoma retraction. Recent research indicates that more than 75% of these individuals will experience complications (6). Patients with a stoma created in an elective setting endure a diminished quality of life (7). Resulting in the regaining of intestinal normality as a critical consideration for these individuals (8). The probability of stoma reversal following emergency formation is still ambiguous, with variations in studies attributed to variables involving stoma type as well as the geographical location of medical professionals. Early reversal of ileostomy has been proven to be safe, possibly decreasing the chance of surgical-related complications for patients. There is significant variance in the implementation of this method in clinical practice for stoma patients. Evidence indicates that the time for reversal for emergency stoma cases is typically longer compared to elective patients (9, 10).

This study aims to assess the outcomes in patients following intestinal stoma reversal. Ileostomy is prevalent in our population, mainly due to the significant incidence of intestinal tuberculosis and enteric fever-related perforations. The outcomes of ileostomy reversal differ across various populations. Furthermore, the absence of emergency healthcare facilities in resource-limited settings typically results in poorer outcomes following complications from reversal procedures. This study aims to elucidate the current burden associated with the outcomes of intestinal stoma reversal. This study's results will be disseminated to local surgeons to inform them of the situation and to formulate future recommendations for its management.

Methodology

This descriptive case series was conducted in the department of surgery from 24 July 2024 to 24 January 2025 at Lady Reading Hospital, Peshawar, following ethical approval from the hospital. A sample of 396 patients was calculated for the study, based on a previous frequency of 4.3% of anastomotic leaks in stoma reversal, with a 2% margin of error and a 95% confidence interval. Consecutive non-probability sampling was used.

Our study included patients of both genders aged 20 to 60 years who were scheduled for temporary intestinal stoma reversal. Patients with a documented history of diabetes mellitus or those with a known Diagnosis of GI tract carcinoma were omitted.

We obtained consent from all the patients. All stoma reversal procedures were performed by a single experienced general surgeon with a minimum of seven years of experience. Patients were assessed for early postoperative complications within 7 days. Complications were a surgical site infection, which was diagnosed based on pain at the surgical site, clinical examination findings of redness, and microbiological confirmation from wound culture. Wound dehiscence was identified as the failure of the surgical wound to heal, resulting in a disruption of all tissue layers observed through the presence of serosanguinous discharge upon clinical examination. The Diagnosis of small bowel obstruction was based on the abdominal pain, bloating, and constipation. Anastomotic leak was diagnosed with abdominal pain, pulse rate exceeding 100 beats

per minute, fever greater than 99.5°F, and apparent leak on gastrografin contrast studies.

Analysis was performed with SPSS 21. Age, BMI, and duration of surgery were assessed using mean and SD. Demographics, which were categorical along with indication for surgery and postoperative outcomes, were assessed using frequency and percentages. Chi-Square test was used for the assessment of the association of post-op outcomes with various variables. P-value if ≤ 0.05 was significant.

Results

The average age of the patients was 41.60 ± 11.859 years. Their mean duration of ileostomy was 4.62 ± 1.757 days, and their average Body Mass Index (BMI) was 25.31 ± 1.91 kg/m².

Our cohort consisted of 225 (56.8%) male and 171 (43.2%) female patients. The majority of patients, 336 (84.8%), were non-smokers. Regarding the indication for surgery, enteric perforation was the most common reason in 215 cases (54.3%). This was followed by trauma in 131 cases (33.1%) and abdominal tuberculosis in 50 cases (12.6%) (Table 1).

The analysis of early postoperative outcomes revealed that surgical site infection was the most frequently observed outcome, which occurred in 97 cases (24.5%). Wound dehiscence was documented in 29 cases (7.3%). Small bowel obstruction was reported in 27 patients (6.8%). Anastomotic leak was less common, occurring in 13 cases (3.3%) (Table 2). Table 3 presents the stratification of postop outcomes with various demographic and clinical variables.

Table 1: Demographic and clinical profile of the patients

Demographic and clinical profile		**n**	**%**
Gender	Male	225	56.8%
	Female	171	43.2%
Socioeconomic status	Low	94	23.7%
	Middle	217	54.8%
	High	85	21.5%
Education status	Literate	184	46.5%
	Illiterate	212	53.5%
Residence area	Rural	191	48.2%
	Urban	205	51.8%
Smoking status	Yes	60	15.2%
	No	336	84.8%
Indication for surgery	Enteric perforation	215	54.3%
	Trauma	131	33.1%
	TB Abdomen	50	12.6%

Table 2: Early postop outcomes

Early postop outcomes		**n**	**%**
Surgical site infection	Yes	97	24.5%
	No	299	75.5%
Wound dehiscence	Yes	29	7.3%
	No	367	92.7%
Small bowel obstruction	Yes	27	6.8%
	No	369	93.2%
Anastomotic leak	Yes	13	3.3%
	No	383	96.7%

Table 3: Stratification of early postop outcomes with various demographic and clinical variables

		Surgical site infection		**Wound dehiscence**		**Small bowel obstruction**		**Anastomotic leak**	
		Yes	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
		%	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Age groups (Years)	20 to 35	30.9	33.8	51.7	31.6	18.5	34.1	46.2	32.6
	36 to 50	39.2	37.8	24.1	39.2	51.9	37.1	30.8	38.4
	> 50	29.9	28.4	24.1	29.2	29.6	28.7	23.1	29.0
P value		P > 0.05		P > 0.05		P > 0.05		P > 0.05	
BMI (Kg/m^2)	18.5 to 25	45.4	67.9	58.6	62.7	74.1	61.5	46.2	62.9
	> 25	54.6	32.1	41.4	37.3	25.9	38.5	53.8	37.1
P value		P < 0.05		P > 0.05		P > 0.05		P > 0.05	
Duration of ileostomy (Days)	2 to 5	62.9	64.9	62.1	64.6	59.3	64.8	69.2	64.2
	> 5	37.1	35.1	37.9	35.4	40.7	35.2	30.8	35.8
P value		P > 0.05		P > 0.05		P > 0.05		P > 0.05	
Gender	Male	51.5	58.5	69.0	55.9	59.3	56.6	61.5	56.7
	Female	48.5	41.5	31.0	44.1	40.7	43.4	38.5	43.3
P value		P > 0.05		P > 0.05		P > 0.05		P > 0.05	
SES	Low	16.5	26.1	24.1	23.7	11.1	24.7	15.4	24.0

	Middle	57.7	53.8	55.2	54.8	59.3	54.5	69.2	54.3
	High	25.8	20.1	20.7	21.5	29.6	20.9	15.4	21.7
P value		P > 0.05		P > 0.05		P > 0.05		P > 0.05	
Education status	Literate	46.4	46.5	41.4	46.9	44.4	46.6	53.8	46.2
	Illiterate	53.6	53.5	58.6	53.1	55.6	53.4	46.2	53.8
P value		P > 0.05		P > 0.05		P > 0.05		P > 0.05	
Residence area	Rural	55.7	45.8	37.9	49.0	48.1	48.2	46.2	48.3
	Urban	44.3	54.2	62.1	51.0	51.9	51.8	53.8	51.7
P value		P > 0.05		P > 0.05		P > 0.05		P > 0.05	
Smoking status	Yes	16.5	14.7	20.7	14.7	18.5	14.9	38.5	14.4
	No	83.5	85.3	79.3	85.3	81.5	85.1	61.5	85.6
P value		P > 0.05		P > 0.05		P > 0.05		P < 0.05	
Indication for surgery	Enteric perforation	59.8	52.5	48.3	54.8	59.3	53.9	38.5	54.8
	Trauma	32.0	33.4	31.0	33.2	29.6	33.3	38.5	32.9
	TB Abdomen	8.2	14.0	20.7	12.0	11.1	12.7	23.1	12.3
P value		P > 0.05		P > 0.05		P > 0.05		P > 0.05	

Discussion

The findings of this study provide a significant contribution to the understanding of early outcomes following temporary intestinal stoma reversal. Our analysis of 396 patients showed that the mean age of our cohort was 41.60 years, which is notably younger than the populations described in several studies. Van Westreenen et al. MacDonald et al. reported median ages of 63 and 49.3 years, respectively, reflecting a higher burden of colorectal cancer and inflammatory bowel disease in those settings (11,12). Our younger cohort aligns more closely with the studies by Tabassum et al. and Shaikh et al., where the mean ages were reported within the third and fourth decades of life, primarily due to the high prevalence of infective and traumatic etiologies.[12,13] This younger age profile is a critical factor in surgical risk assessment and post-operative recovery potential.

The indications for the initial stoma formation in our study further underscore the distinct clinical challenges in our region. Enteric perforation was the leading cause (54.3%), which was followed by trauma (33.1%) and abdominal tuberculosis (12.6%). Our findings are consistent with Khan et al., who reported an almost identical distribution, with enteric perforation at 44%, blunt trauma at 36%, and tuberculous abdomen at 20% (14). Tabassum et al. found typhoid perforations to be the predominant indication (52.5%) (12). MacDonald et al. found that gastrointestinal perforation and significant bowel obstruction were standard (15). This consistent pattern across multiple regional studies highlights a public health focus distinct from that of developed nations, centering on preventable infectious diseases and trauma.

When examining early postoperative complications, our observed surgical site infection (SSI) rate of 24.5% appeared to be higher than the 6.25% (superficial) documented by Tabassum et al. and 8% reported by Khan et al (12, 14). Aldardeer et al. in Egypt reported a wound infection rate of 28.5% in their series of early same-admission closures.[16] The study from Bangladesh by Talukdar et al. also reported a notably high wound infection rate of 40% (17). This suggests that while early stoma reversal is feasible, it may inherently carry an increased risk of wound complications. This is potentially due to the more immature state of tissues and the presence of a healing stoma site, which can act as a focus for contamination.

Our rates of other key complications were mainly within the ranges reported in studies. The wound dehiscence rate of 7.3% is comparable to the 6% found by Khan et al. and the 7.5% reported by Tabassum et al (14,12). Small bowel obstruction (SBO) was observed in 6.8% of our patients, which aligns well with the 5% reported by Khan et al and the 6.5% documented by van Westreenen et al (14,11). MacDonald et al. reported a much higher post-operative ileus rate of 38.4% (15). Anastomotic leak occurred in 3.3% of our patients. Van Westreenen et al. reported an anastomotic leak rate of 4.3%, Khan et al. reported 1%, and Talukdar et al. reported 6.7%.

In our study, we defined early postoperative outcomes as those occurring within seven days post-surgery. This is similar to the findings of Khan et al., as they documented the postoperative complications after seven days of surgery (14).

Conclusion

In conclusion, our study demonstrated that early postoperative outcomes after temporary intestinal stoma reversal surgery included surgical site infection (24.5%), wound dehiscence (7.3%), small bowel obstruction (6.8%), and anastomotic leak (3.3%). Stoma reversal is not only feasible but can also be performed with a safety profile for significant complications.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate
Approved by the department concerned. (IRB-998/LRH/ MTI)

Consent for publication
Approved

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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

ZB (Postgraduate Resident)
Manuscript drafting, Study Design,
Review of Literature, Data entry, Data analysis, and drafting an article.
HNU (Associate Professor)
Supervision, Conception of Study, Development of Research Methodology Design, Study Design, manuscript review, and critical input.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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