

A Study on Indications, Complications and Management in An Intestinal Stoma Patient

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ABSTRACT

Background: Intestinal stoma formation is a crucial surgical procedure for managing various gastrointestinal conditions, including malignancies, perforations, and trauma. While life-saving, stomas are associated with a range of complications that can impact the quality of life and recovery of patients. This study aims to investigate the indications, complications, and management strategies associated with intestinal stomas in an Indian healthcare setting.

Objective: To evaluate the indications for stoma formation, common complications, and the outcomes of various management strategies in patients undergoing ileostomy or colostomy procedures.

Methods: A prospective observational study was conducted at a tertiary care teaching hospital in Karad, India, over 18 months. Data were collected from preoperative assessments to postoperative follow-up, with patients enrolled based on specific inclusion criteria. The sample size consisted of 38 patients, who were followed for 24 weeks. The study focused on demographic data, indications for surgery, early and late complications, and stoma reversal outcomes.

Results: The study found that most participants were aged 40–49 years, with colonic adenocarcinoma being the leading indication for stoma formation. Common early complications included skin excoriation (17.9%) and high-output stoma (11.4%). Ileostomies showed significantly higher complication rates than colostomies. Stoma reversal was performed in 39.4% of patients within 24 weeks. Other complications included peristomal wound infections (14.9%) and prolapse (2.6%).

Conclusion: This study highlights the importance of early identification and management of complications in patients undergoing stoma formation. Personalized perioperative care, especially for high-risk stoma types like ileostomies, can significantly improve outcomes and reduce the occurrence of complications.

KEYWORDS: Intestinal Stoma, Ileostomy, Colostomy, Complications, Stoma Reversal

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INTRODUCTION

The formation of an intestinal stoma is a widely recognized surgical procedure, essential in the management of several gastrointestinal pathologies. An intestinal stoma is a surgically created opening on the anterior abdominal wall through which intestinal contents are diverted, often due to conditions such as intestinal perforations, malignancies, trauma, or obstruction [1]. This life-saving procedure may be temporary or permanent, depending on the underlying indication and the condition of the patient [2].

Stomas are typically formed in both emergency and elective surgical scenarios. Common types of stomas include loop ileostomy, end ileostomy, loop colostomy, and end colostomy. Among these, loop ileostomy has emerged as the most frequently employed type, especially in emergencies, due to its technical ease and reduced risk of complications like prolapse and stenosis [3]. A study from Chennai reported that 80% of the cases involved ileostomies, with loop ileostomy being the most prevalent type at 60% [3]. Despite its importance, stoma formation is associated with a high incidence of complications that can significantly affect patients' quality of life and recovery. Complications can be early or late, with early issues including ischemia, necrosis, and skin irritation, and late complications such as prolapse, hernia, stenosis, and psychological distress [2]. Peristomal skin irritation is among the most common, often resulting from enzyme-rich effluent causing chemical dermatitis, affecting up to 52% of patients in some cohorts [4].

In a comprehensive Indian study from Stanley Medical College, skin excoriations were observed in over half of the patients, followed by laparotomy wound infections in 8.5% of cases. These complications were more prevalent in emergency settings, where preoperative optimization may not always be feasible [3]. The complexity increases in patients with comorbidities or in resource-constrained settings, such as in Pakistan, where colostomies were frequently performed for abdominal trauma and tuberculosis, and non-functioning stomas and excoriation were common complications [5].

A tertiary care study in Bhopal demonstrated that 97% of stoma procedures were conducted in emergencies, highlighting the acute nature of most cases. Enteric perforation and Koch's abdomen were the leading indications [1]. Similarly, studies in Peshawar revealed that ileostomies were performed in 65% of cases, with complications such as skin excoriation, oedema, and prolapse requiring both conservative and surgical interventions [6].

Effective management of these complications begins with meticulous surgical planning, appropriate site selection, and post-operative care. A study emphasized that complications are often preventable with good preoperative preparation and postoperative support, including patient education and stoma care training [7]. Skin complications can be mitigated by using barrier creams and correctly sized stoma appliances, while prolapse and retraction may sometimes require revision surgery [8].

In terms of demographics, middle-aged and older adults constitute the majority of stoma patients. A study from Government Stanley Medical College showed the highest incidence among those aged 26–55 years, with stomas being more common in males [3]. These trends are echoed in other Indian settings, emphasizing the burden on the productive age group and the socio-economic implications of stoma-related morbidities [9].

Notably, studies from both Indian and international contexts converge on one central theme: while intestinal stomas are crucial surgical interventions, their success hinges on early identification and timely management of complications. Conservative strategies can resolve most early issues, while surgical correction is reserved for more severe or persistent cases [10].

This study aims to investigate the prevailing indications, associated complications, and best practices in the management of intestinal stomas, particularly in the Indian healthcare context. Understanding these facets can contribute to improving surgical outcomes, reducing morbidity, and enhancing the quality of life for stoma patients.

METHODOLOGY

1. Study Design

This was a prospective observational study aimed at evaluating the indications, complications, and management of patients undergoing intestinal stoma formation. Data were collected from preoperative assessment through postoperative follow-up without any intervention. All patients received standard care, and their clinical progress was documented to understand stoma-related outcomes in a real-world hospital setting.

2. Study Setting

The study was conducted at a tertiary care teaching hospital in Karad, India. The hospital provided emergency and elective gastrointestinal surgeries, supported by ICU, HDU, and a dedicated stoma care outpatient clinic. A multidisciplinary team ensured comprehensive care, facilitating accurate and consistent data collection across various stages of treatment.

3. Study Duration

The study spanned 18 months, from May 2023 to December 2024. Patients were enrolled during the first 12 months and followed for six months postoperatively. Follow-up evaluations were done at 4, 8, 12, 18, and 24 weeks to monitor early and late complications and management outcomes.

4. Participants – Inclusion and Exclusion Criteria

Eligible participants were adults aged 20–60 years who underwent ileostomy or colostomy for gastrointestinal conditions. Excluded were patients with urinary stomas, pregnant women, those outside the age range, or those unwilling to consent. This ensured a focused study population and reduced confounding variables.

5. Study Sampling

Non-probability convenience sampling was used. All eligible and consenting patients requiring stoma formation during the recruitment period were included. This approach allowed for practical enrollment and reflected a real-world patient population, capturing diverse clinical presentations without selective bias.

6. Study Sample Size

Based on an estimated 80% complication rate, a 10% margin of error, and 95% confidence level, a minimum sample size of 38 was calculated. This allowed for meaningful statistical analysis and accounted for potential dropouts during the follow-up period.

7. Study Groups

Patients were categorized postoperatively into ileostomy and colostomy groups. They were further stratified by the underlying pathology—benign or malignant. This grouping enabled comparison of complication rates, outcomes, and specific management strategies between different stoma types and indications.

8. Study Parameters

Collected data included age, gender, surgical indication, stoma type and location, perioperative details, and complications such as skin excoriation, prolapse, or hernia. Management methods, duration of hospital stay, and reversal success were also tracked to evaluate overall outcomes.

9. Study Procedure

Eligible patients were consented and assessed preoperatively. Standard surgical techniques were used for stoma creation.

Postoperative care involved regular monitoring, stoma education, and documentation of complications. Follow-up visits were scheduled to track healing, symptom development, and interventions.

10. Study Data Collection

Data were gathered using medical records, operative notes, patient interviews, and follow-up forms. In-hospital events and outpatient outcomes were recorded in standardized case sheets. Stoma function, skin integrity, and quality-of-life aspects were routinely monitored and entered into a secure database.

11. Data Analysis

Data were analyzed using SPSS v22.0. Descriptive statistics summarized baseline variables. Chi-square and t-tests were used for group comparisons, with significance set at $p < 0.05$. Multivariate analysis was performed to identify factors associated with increased complications or prolonged recovery.

12. Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee. Written informed consent was taken from all participants. Confidentiality was maintained using coded identifiers. Participation was voluntary, with no impact on care. Adverse events were reported as per ethical guidelines.

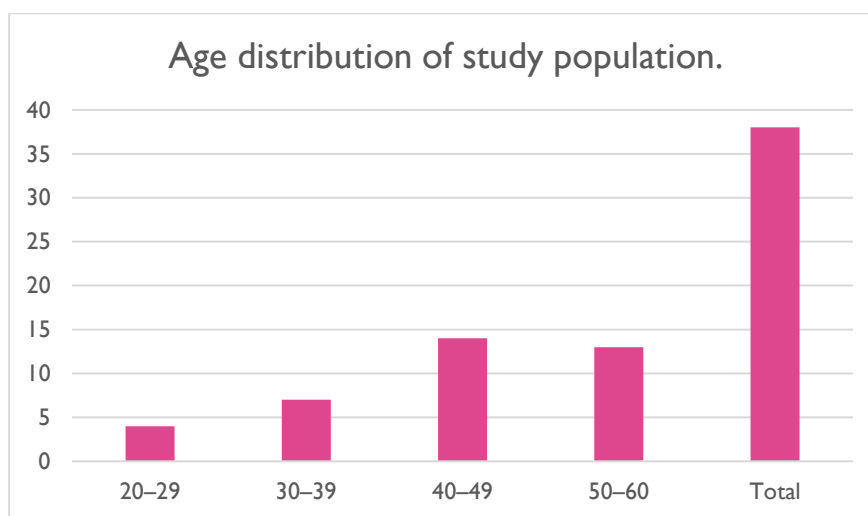
RESULTS

1. Age Distribution of Study Participants

Most participants were aged 40–49 years, followed by 50–60 years, indicating that middle-aged and older adults are more commonly affected by conditions requiring stoma formation (Table 1).

Table 1: Age Distribution of Study Participants (n = 38)

Age Group (Years)	Frequency (n)	Percentage (%)
20–29	4	10.4
30–39	7	17.9
40–49	14	37.3
50–60	13	34.3
Total	38	100.0
Mean ± SD	45.3 ± 9.2	–



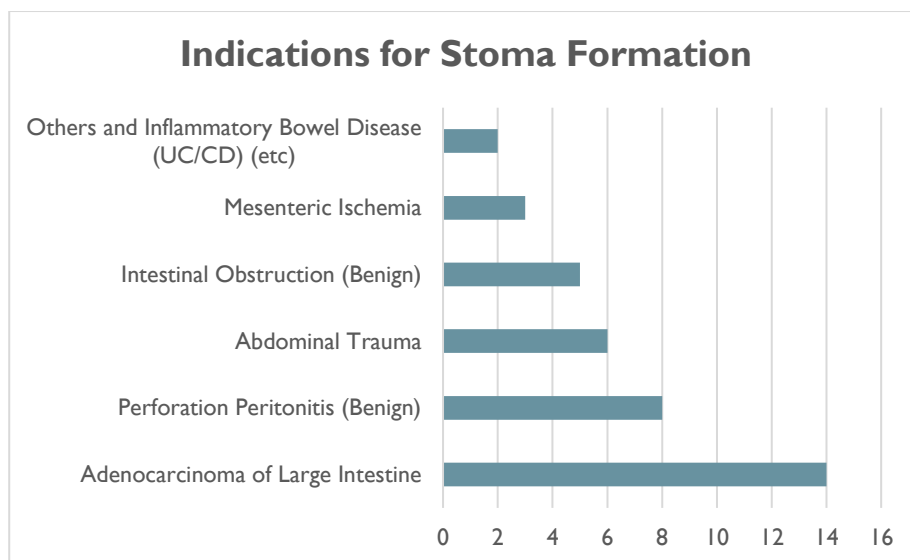
Graph 1: Age Distribution of Study Participants

2. Indications for Stoma Formation

Colonic adenocarcinoma was the leading indication for stoma, followed by benign causes like perforation and trauma, showing the broad utility of stoma formation across conditions (Table 2).

Table 2: Indications for Stoma Formation (n = 38)

Indication	Frequency (n)	Percentage (%)
Adenocarcinoma of Large Intestine	14	37.3
Perforation Peritonitis (Benign)	8	22.4
Abdominal Trauma	6	14.9
Intestinal Obstruction (Benign)	5	11.9
Mesenteric Ischemia	3	9.0
Others and Inflammatory Bowel Disease (UC/CD) (etc)	2	4.5



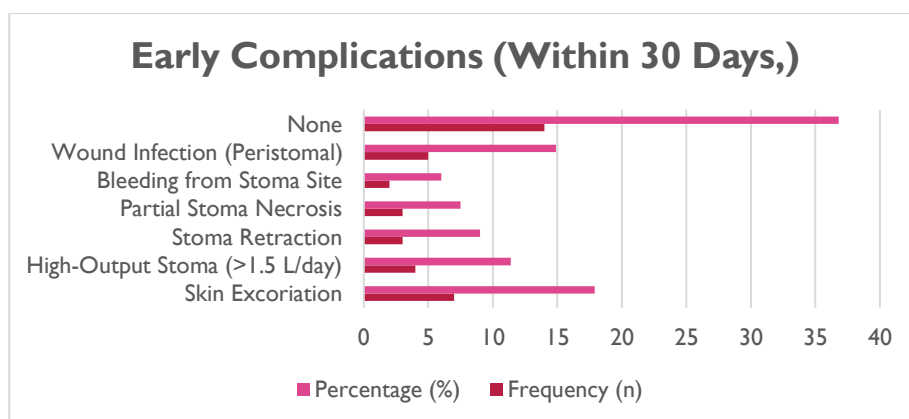
Graph 2: Indications for Stoma Formation

3. Early Complications (Within 30 Days)

Skin excoriation and high-output stoma were the most frequent early complications, while over one-third experienced no early issues, highlighting the benefit of proper perioperative care (Table 3).

Table 3: Early Complications (Within 30 Days, n = 38)

Complication	Frequency (n)	Percentage (%)
Skin Excoriation	7	17.9
High-Output Stoma (>1.5 L/day)	4	11.4
Stoma Retraction	3	9.0
Partial Stoma Necrosis	3	7.5
Bleeding from Stoma Site	2	6.0
Wound Infection (Peristomal)	5	14.9
None	14	36.8



Graph 3: Early Complications (Within 30 Days, n = 38)

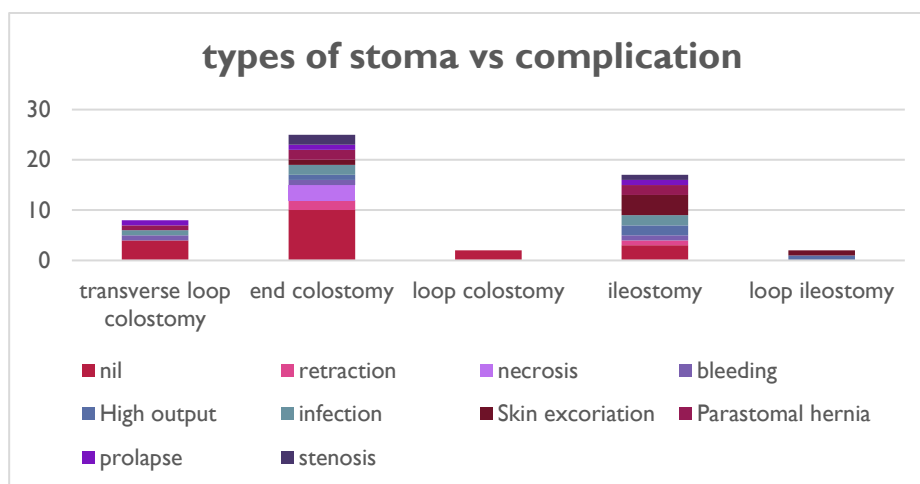
4. Types of Stoma vs Complications

Ileostomies had higher complication rates than colostomies, a statistically significant finding supporting careful monitoring of ileostomy patients (p = 0.030) (Table 4).

Table 4: Types of Stoma vs Complication

Complications	Transverse Loop Colostomy	End Colostomy	Loop Colostomy	Ileostomy	Loop Ileostomy
Nil	4	10	2	3	0
Retraction	0	2	0	1	0
Necrosis	0	3	0	0	0
Bleeding	1	1	0	1	0
High Output	0	1	0	2	1
Infection	1	2	0	2	0

Skin Excoriation	0	1	0	4	1
Parastomal Hernia	1	2	0	2	0
Prolapse	1	1	0	1	0
Stenosis	0	2	0	1	0



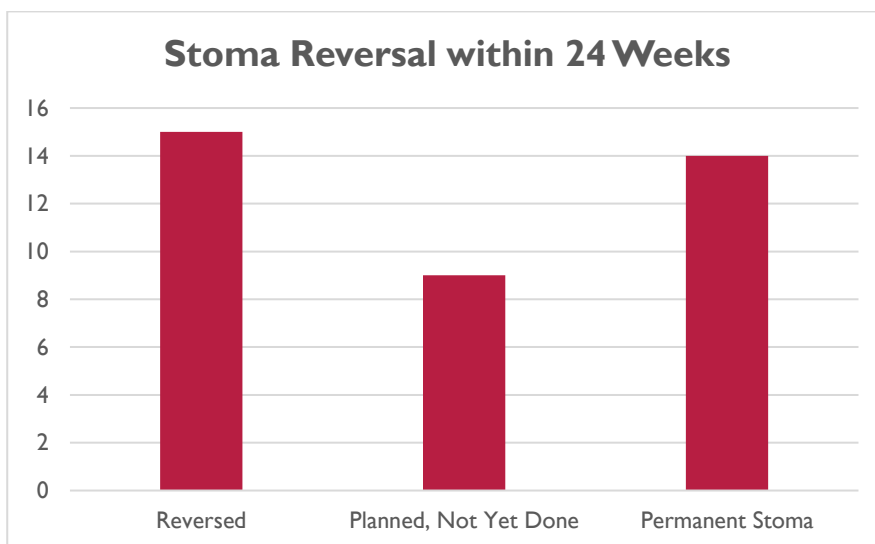
Graph 4: Types of Stoma vs Complication

5. Stoma Reversal within 24 Weeks

About 39% of patients had their stomas reversed within 24 weeks, while 36.8% retained permanent stomas, influenced by disease severity and comorbidities (Table 5).

Table 5: Stoma Reversal within 24 Weeks (n = 38)

Reversal Status	Frequency (n)	Percentage (%)
Reversed	15	39.4
Planned, Not Yet Done	9	25.3
Permanent Stoma	14	36.8



Graph 5: Stoma Reversal within 24 Weeks

DISCUSSION

This prospective observational study investigated the demographic trends, indications, complications, and management outcomes in patients undergoing intestinal stoma formation. Several of our findings are in agreement with previously published literature. In our study, the predominant age group was 40–49 years (37.3%), followed by 50–60 years (34.3%), with a mean age of 45.3 years. These findings align with observations made by Pandiarajan (2015), who also reported a high incidence among individuals aged 26–55 years [3]. This pattern suggests that stoma formation is more common among middle-aged adults, particularly due to malignant and emergency abdominal conditions.

Colonic adenocarcinoma emerged as the leading indication for stoma formation in our cohort (37.3%), followed by benign causes

such as perforation peritonitis (22.4%) and abdominal trauma (14.9%). Similar trends were reported by Ahmad et al. (2013) and Ullah et al. (2011), where malignancies and emergency surgical conditions were the most common causes [1, 6]. In contrast, studies conducted in resource-limited settings such as Pakistan often identified abdominal trauma as a more frequent indication (Alam et al., 2022), likely due to differences in healthcare access and referral patterns [5].

Regarding complications, early postoperative issues were notable, with skin excoriation (17.9%), high-output stoma (11.4%), and peristomal wound infections (14.9%) being the most common. These findings are consistent with those of Nordgren (1995) and Cataldo (1999), who highlighted that peristomal skin problems and fluid imbalances, especially in ileostomy patients, are among the most prevalent early complications [7, 2]. Our data further revealed that ileostomies had significantly higher complication rates compared to colostomies ($p = 0.030$), echoing the results of Thamilselvam (2019), who reported similar trends [8].

Stoma reversal was performed in 39.4% of patients within 24 weeks, while 36.8% retained permanent stomas. This closely mirrors the findings of Rajashekara Babu et al. (2024), who observed similar outcomes in cases where malignancy and comorbidities precluded reversal [4].

Overall, our results reaffirm existing evidence while emphasizing the need for personalized perioperative care, especially for high-risk stoma types like ileostomy.

CONCLUSION

This study underscores the critical role of early intervention and tailored care in managing intestinal stomas. The findings reveal that while ileostomies are associated with higher complication rates, careful perioperative management can mitigate many early and late complications. Stoma reversal remains a key objective for many patients, particularly when the underlying condition allows. These results emphasize the need for continuous monitoring, patient education, and surgical optimization to enhance patient outcomes and improve quality of life post-surgery.

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