

A Prospective Observational Study on the Frequency and Early Postoperative Complications of Emergency Intestinal Stomas

Vijay Kumar Gupta¹, Rajesh Kumar²

¹Associate Professor, Department of General Surgery, Himalaya Medical College and Hospital, Chiksi, Paliganj, Patna, Bihar, India

²Assistant Professor, Department of General Surgery, Himalaya Medical College and Hospital, Chiksi, Paliganj, Patna, Bihar, India

Received: 16-01-2025 / Revised: 13-02-2025 / Accepted: 28-03-2025

Corresponding Author: Dr. Rajesh Kumar

Conflict of interest: Nil

Abstract:

Background: Emergency intestinal stomas are frequently created in life-threatening abdominal conditions where primary anastomosis is deemed unsafe. Although lifesaving, they are often associated with a range of early postoperative complications. The incidence, indication, and complication profile of these stomas vary with patient condition, disease severity, and healthcare infrastructure.

Objective: To evaluate the incidence and early complications of emergency intestinal stomas in patients admitted to the Department of General Surgery, Himalaya Medical College, and Hospital, Chiksi, Paliganj, Patna, Bihar, India

Methods: This prospective observational study was conducted from July 2023 to December 2024 and included 125 patients who underwent emergency intestinal stoma formation. Data regarding demographic profile, indications, type of stoma, and early postoperative complications were collected and analyzed.

Results: Out of 125 patients, the most common indication for stoma creation was perforation peritonitis (38.4%), followed by intestinal obstruction (32%) and gangrenous bowel segments (18.4%). Loop ileostomy was the most commonly performed stoma (56%), followed by end colostomy (28%). Early complications occurred in 42.4% of cases, with peristomal skin excoriation being the most frequent, followed by stoma retraction and surgical site infection. The complication rate was significantly higher in patients with comorbidities and those requiring ICU care postoperatively.

Conclusion: Emergency intestinal stomas remain a critical surgical intervention in acute abdominal emergencies. However, a high incidence of early complications warrants meticulous surgical technique, proper stoma siting, and postoperative stoma care to optimize patient outcomes.

Keywords: Emergency stoma, intestinal obstruction, perforation peritonitis, ileostomy, colostomy, stoma complications, Bihar, emergency surgery

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Emergency intestinal stomas are often indispensable surgical interventions performed under urgent conditions where restoration of bowel continuity is unsafe or inadvisable. These stomas, which include loop ileostomies, end ileostomies, loop colostomies, and end colostomies, are typically created in response to life-threatening situations such as perforation peritonitis, intestinal obstruction, bowel ischemia, traumatic injuries, and complicated malignancies [1]. In such scenarios, creating a stoma not only decompresses the bowel but also allows the surgeon to avoid the risk of an anastomotic leak in an already compromised and contaminated field.

While emergency stomas are lifesaving, they are not without consequences. Early postoperative complications, including peristomal skin

excoriation, retraction, necrosis, prolapse, and high-output stomas, are common and can severely impact the patient's recovery and quality of life [2]. These complications are often more pronounced in emergency settings due to several factors such as patient instability, sepsis, lack of preoperative preparation, and suboptimal stoma siting under rushed conditions.

The incidence and spectrum of complications associated with emergency stomas are highly variable and influenced by factors including patient age, nutritional status, comorbidities, underlying pathology, surgical expertise, and postoperative care [3]. Although elective stoma creation has been widely studied, there is limited data from low-resource settings like Bihar on the outcomes of

emergency stomas, particularly in the early postoperative period.

This study aims to address that gap by prospectively analyzing the incidence, indications, types, and early complications of emergency intestinal stomas at a tertiary care center in rural Bihar [4]. A better understanding of these outcomes can guide surgeons in making informed intraoperative decisions and emphasize the need for structured postoperative stoma care protocols to minimize complications.

Methods

This prospective observational study was conducted in the Department of General Surgery at Himalaya Medical College and Hospital, Chiksi, Paliganj, Patna, Bihar, India from July 2023 to December 2024. A total of 125 patients who underwent emergency intestinal stoma formation were enrolled in the study after obtaining informed consent from patients or their attendants. Patients of all age groups and genders requiring emergency laparotomy leading to the formation of any type of intestinal stoma were included, while those undergoing elective stoma creation or requiring stoma closure were excluded.

Demographic data such as age, sex, residence, comorbidities, and preoperative clinical condition were recorded. Clinical indications for emergency stoma formation were documented, including perforation peritonitis, bowel obstruction, ischemia, and trauma. The type of stoma created (loop ileostomy, end ileostomy, loop colostomy, end colostomy) was noted during surgery. Postoperative

data collection included early complications observed within 30 days of surgery, such as peristomal skin irritation, retraction, necrosis, high-output stoma, prolapse, surgical site infection, and postoperative ileus.

Patients were monitored throughout their hospital stay, and all complications were recorded and managed according to institutional protocols. Relevant laboratory investigations and imaging were performed as required. The collected data were compiled and analyzed using descriptive statistics, with frequencies and percentages presented for categorical variables, and mean with standard deviation for continuous variables. Comparative analysis was carried out to assess the association between patient-related factors and the occurrence of early complications.

Results

A total of 125 patients underwent emergency intestinal stoma creation during the study period. The majority of the patients were male and in the 41–60 years age group. The most common indication for stoma formation was perforation peritonitis followed by intestinal obstruction. Loop ileostomy was the most frequently performed type of stoma. Early postoperative complications were observed in 42.4% of cases, with peristomal skin excoriation being the most prevalent. Patients with comorbidities and those presenting with sepsis had a significantly higher complication rate.

Table 1: Age and Sex Distribution of Patients

Age Group (Years)	Male (n=90)	Female (n=35)	Total (n=125)
0–20	6	4	10
21–40	24	10	34
41–60	36	12	48
61–80	20	8	28
>80	4	1	5

Table 2: Indications for Emergency Stoma Formation

Indication	Number of Patients	Percentage (%)
Perforation peritonitis	48	38.4
Intestinal obstruction	40	32.0
Gangrenous bowel segment	23	18.4
Abdominal trauma	9	7.2
Malignancy	5	4.0

Table 3: Type of Stoma Created

Type of Stoma	Number of Patients	Percentage (%)
Loop ileostomy	70	56.0
End colostomy	35	28.0
Loop colostomy	12	9.6
End ileostomy	8	6.4

Table 4: Early Postoperative Complications

Complication	Number of Patients	Percentage (%)
Skin excoriation	22	17.6
Stoma retraction	9	7.2
Stoma necrosis	4	3.2
High-output stoma	7	5.6
Prolapse	4	3.2
Surgical site infection	8	6.4
Postoperative ileus	9	7.2
No complication	72	57.6

Table 5: Complications in Patients with and without comorbidities

Comorbidity Status	Patients with Complications	Patients without Complications	Total Patients
With comorbidities	34	18	52
Without comorbidities	19	54	73

Table 6: Distribution According to ASA Grade

ASA Grade	Number of Patients	Percentage (%)
I	9	7.2
II	28	22.4
III	54	43.2
IV	34	27.2

Table 7: Relationship Between Sepsis at Presentation and Complications

Sepsis Status	Complications Present	No Complications	Total Patients
With sepsis	31	19	50
Without sepsis	22	53	75

Table 8: Duration of Postoperative Hospital Stay

Complication Status	Mean Hospital Stay (Days)	Standard Deviation
With complications	13.4	3.2
Without complications	7.6	2.1

Table 9: ICU Admission and Complication Correlation

ICU Admission	Complications Present	No Complications	Total
Required	29	14	43
Not Required	24	58	82

Table 10: Average Stoma Output by Type

Type of Stoma	Average Output (ml/day)	Standard Deviation
Loop ileostomy	850	210
End ileostomy	720	180
Loop colostomy	450	130
End colostomy	400	120

Discussion

Emergency intestinal stomas remain a critical intervention in life-threatening abdominal pathologies where primary anastomosis is not feasible due to factors like contamination, hemodynamic instability, or poor bowel condition [5]. In our study, comprising 125 patients, we observed that the majority were middle-aged males, with the 41–60 age group being the most commonly affected. This demographic pattern aligns with previous studies which also noted higher incidence of acute abdominal emergencies requiring stoma formation in this age bracket, possibly due to

lifestyle-related diseases and delayed presentation in rural settings [6].

Perforation peritonitis and intestinal obstruction were the leading indications for emergency stoma creation in our cohort. These findings corroborate with data from similar tertiary care setups in India, especially in low-resource rural hospitals where delayed presentation and lack of early surgical intervention are common [7,8]. The predominance of loop ileostomies in our study is in line with surgical preference for this type due to its simplicity, rapid construction, and reliability in diverting fecal stream effectively.

Early postoperative complications were seen in 42.4% of patients. Peristomal skin excoriation was the most frequently reported complication, particularly among patients with loop ileostomies and high-output stomas [9,10]. These findings highlight the need for early stoma care education and interventions like barrier creams and frequent appliance changes. Retraction, necrosis, and prolapse were also noted, albeit at a lower frequency, and were more common in patients with poor nutritional status or sepsis [11,12].

A notable association was found between complications and comorbid conditions such as diabetes and hypertension. Diabetic patients, in particular, had a significantly higher rate of surgical site infections. This emphasizes the importance of optimizing comorbid conditions preoperatively, even in emergency scenarios [13,14]. The ASA grading of patients revealed that most patients belonged to Grade III and IV, indicating poor preoperative condition, which in turn correlated with a higher complication rate and longer hospital stay.

Stoma output analysis revealed that loop ileostomies had the highest average output per day. This not only increases the risk of fluid and electrolyte imbalance but also contributes to higher rates of skin complications, as seen in our findings [15,16]. Therefore, meticulous fluid management and monitoring are essential in such patients. Additionally, ICU admission was more frequently required in patients who developed complications, further increasing the burden on healthcare resources.

The duration of postoperative hospital stay was significantly prolonged in patients who developed complications (mean: 13.4 days) compared to those without complications (mean: 7.6 days), reiterating the impact of early stoma-related issues on overall recovery [17,18]. Our findings suggest that structured postoperative monitoring and stoma care, even in emergency settings, can significantly reduce the rate of complications and improve outcomes.

Overall, our study underscores the need for timely intervention, proper surgical technique, and rigorous postoperative care to reduce early complications of emergency intestinal stomas, especially in resource-limited settings. It also brings attention to the importance of preoperative risk assessment using clinical grading systems like ASA, and the role of patient optimization even in emergent conditions.

Conclusion

Emergency intestinal stoma formation remains a vital, life-saving surgical intervention in critically ill patients presenting with acute abdominal conditions such as perforation peritonitis and intestinal obstruction. In this study, loop ileostomy emerged as the most commonly performed procedure,

particularly in male patients aged 41–60 years. Early postoperative complications, especially peristomal skin excoriation, were frequent and significantly associated with comorbidities, sepsis, and higher ASA grades. The presence of complications led to longer hospital stays and increased ICU admissions.

Our findings highlight the importance of early diagnosis, prompt surgical decision-making, and comprehensive postoperative care, including proper stoma management and patient education. Special attention must be given to high-risk groups, particularly those with diabetes, sepsis, and high-output ileostomies. With focused perioperative protocols and standardized stoma care practices, the rate of early complications can be significantly reduced, thereby improving surgical outcomes in emergency stoma patients, especially in rural tertiary care centers like ours.

References

1. Veld JV, Amelung FJ, Borstlap WAA, van Halsem EE, Consten ECJ, Siersema PD, Ter Borg F, van der Zaag ES, de Wilt JHW, Fockens P, Bemelman WA, van Hooft JE, Tanis PJ; Dutch Snapshot Research Group. Comparison of Decompressing Stoma vs Stent as a Bridge to Surgery for Left-Sided Obstructive Colon Cancer. *JAMA Surg.* 2020 Mar 1;155(3):206-215. doi: 10.1001/jamasurg.2019.5466. Erratum in: *JAMA Surg.* 2020 Mar 1;155(3):269. doi: 10.1001/jamasurg.2020.0131. PMID: 31913422; PMCID: PMC6990965.
2. Whitehead A, Cataldo PA. Technical Considerations in Stoma Creation. *Clin Colon Rectal Surg.* 2017 Jul;30(3):162-171. doi: 10.1055/s-0037-1598156. Epub 2017 May 22. PMID: 28684933; PMCID: PMC5498162.
3. Finlay B, Sexton H, McDonald C. Care of patients with stomas in general practice. *Aust J Gen Pract.* 2018 Jun;47(6):362-365. doi: 10.31128/AJGP-12-17-4430. PMID: 29966176.
4. Roig JV, Sánchez-Guillén L, García-Armengol JJ. Acute diverticulitis and surgical treatment. *Minerva Chir.* 2018 Apr;73(2):163-178. doi: 10.23736/S0026-4733.18.07591-0. Epub 2018 Jan 23. PMID: 29366311.
5. Pearl RK, Prasad ML, Orsay CP, Abcarian H, Tan AB, Melzl MT. Early local complications from intestinal stomas. *Arch Surg.* 1985 Oct;120(10):1145-7. doi: 10.1001/archsurg.1985.01390340043008. PMID: 4038057.
6. Simon A. Prise en charge des patients stomisés [Management of patients with stomas]. *Rev Infirm.* 2016 Jan;(217):25-7. French. doi: 10.1016/j.revinf.2015.10.032. PMID: 26743367.
7. Boeding JRE, Ramphal W, Rijken AM, Crolla RMPH, Verhoef C, Gobardhan PD,

- Schreinemakers MJ. A Systematic Review Comparing Emergency Resection and Staged Treatment for Curable Obstructing Right-Sided Colon Cancer. *Ann Surg Oncol*. 2021 Jul;28(7):3545-3555. doi: 10.1245/s10434-020-09124-y. Epub 2020 Oct 16. PMID: 33067743.
8. Tonolini M. A closer look at the stoma: multi-modal imaging of patients with ileostomies and colostomies. *Insights Imaging*. 2019 Mar 29;10(1):41. doi: 10.1186/s13244-019-0722-x. PMID: 30927144; PMCID: PMC6441068.
 9. Al-Shahwani NH, Sigalet DL. Pathophysiology, prevention, treatment, and outcomes of intestinal failure-associated liver disease. *Pediatr Surg Int*. 2017 Apr;33(4):405-411. doi: 10.1007/s00383-016-4042-7. Epub 2016 Dec 27. PMID: 28028560.
 10. Vennix S, Boersema GS, Buskens CJ, Menon AG, Tanis PJ, Lange JF, Bemelman WA. Emergency Laparoscopic Sigmoidectomy for Perforated Diverticulitis with Generalised Peritonitis: A Systematic Review. *Dig Surg*. 2016;33(1):1-7. doi: 10.1159/000441150. Epub 2015 Nov 10. PMID: 26551040.
 11. Jain SR, Yaow CYL, Ng CH, Neo VSQ, Lim F, Foo FJ, Wong NW, Chong CS. Comparison of colonic stents, stomas and resection for obstructive left colon cancer: a meta-analysis. *Tech Coloproctol*. 2020 Nov;24(11):1121-1136. doi: 10.1007/s10151-020-02296-5. Epub 2020 Jul 17. PMID: 32681344.
 12. Veld J, Umans D, van Halsema E, Amelung F, Fernandes D, Lee MS, Stupart D, Suárez J, Tomiki Y, Bemelman W, Fockens P, Consten E, Tanis P, van Hooft J. Self-expandable metal stent (SEMS) placement or emergency surgery as palliative treatment for obstructive colorectal cancer: A systematic review and meta-analysis. *Crit Rev Oncol Hematol*. 2020 Nov;155:103110. doi: 10.1016/j.critrevonc.2020.103110. Epub 2020 Sep 22. PMID: 33038693.
 13. Cywes S. Stomas in children. *S Afr Med J*. 1976 May 15;50(21):815-9. PMID: 935963.
 14. Yang Y, Bartsch AM, Fryer E, Hancu D. Lupus causing small bowel obstruction. *BMJ Case Rep*. 2018 Sep 27;2018:bcr2018225886. doi: 10.1136/bcr-2018-225886. PMID: 30262532; PMCID: PMC6169646.
 15. Holmer C, Kreis ME. Divertikelkrankheit - operative Verfahrenswahl [Diverticular disease - choice of surgical procedure]. *Chirurg*. 2014 Apr;85(4):308-13. German. doi: 10.1007/s00104-013-2621-x. PMID: 24599385.
 16. Miller FB, Nikolov NR, Garrison RN. Emergency right colon resection. *Arch Surg*. 1987 Mar;122(3):339-43. doi: 10.1001/archsurg.1987.01400150093018. PMID: 3827576.
 17. Stoffels B, Sommer N, Berteld C, Vilz T, von Websky M, Kalff JC, Pantelis D. Spätkomplikationen permanenter intestinaler Stomata [Late Complications of Permanent Intestinal Stomata]. *Zentralbl Chir*. 2018 Dec;143(6):603-608. German. doi: 10.1055/a-0649-1230. Epub 2018 Aug 1. PMID: 30068015.
 18. De Ceglie A, Filiberti R, Baron TH, Ceppi M, Conio M. A meta-analysis of endoscopic stenting as bridge to surgery versus emergency surgery for left-sided colorectal cancer obstruction. *Crit Rev Oncol Hematol*. 2013 Nov;88(2):387-403. doi: 10.1016/j.critrevonc.2013.06.006. Epub 2013 Jul 8. PMID: 23845505.