

Comprehending the Complications of Intestinal Stomas

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Abstract:

Background: Intestinal stoma is a very commonly performed procedure with a high rate of complications. This results in a high rate of morbidity and psychological distress for the patients. This study was undertaken to study the various types of complications in different types of intestinal stomas and their management.

Materials and Methods Complications were studied in 100 patients undergoing stoma formation at Government General Hospital, Guntur, from January 2019 to December 2020. Both elective and emergency procedures were included in the study. Data was collected by following up the patient postoperatively either by phone or in person.

Results: Various types of complications in various stoma types were studied. Complication rates in emergency and elective stoma formation was studied.

Conclusion: Stoma formation is associated with a high rate of complications. Loop ileostomy is associated with the highest rate of complications. Complications were more during emergency settings. Local sepsis was the most common complication. Parastomal hernia was a common and a difficult complication to treat. Stomal prolapse and stomal necrosis were the other complications encountered.

Key Words: Intestinal stomas, complications, management.

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I. Introduction

A stoma formation is a lifesaving procedure, but the emotional as well the functional impairment that a patient undergoing a stoma construction goes through, particularly in the early postoperative stages, is remarkable. The burden of stoma related morbidity for patients is significant in the immediate and late postoperative period. The rate of complications following stoma creation is not insignificant, and care must be taken to adhere to sound surgical technique during this part of the operation. Complications associated with stomas can be minor, requiring only local care and enterostomal therapy (ET)—or can be devastating, leading to multiple reoperations and significant morbidity.^{1,2,3} There are also financial implications for patients as well as healthcare services. Thus, any recommendations and inputs in the management of stoma peri-operatively or postoperatively, or modifications in surgical technique, which seem to have merit, are useful for surgeons. When complications occur and accumulate, however minor, the degree of social restrictions on a patient leads to severe detriment to QOL and even social isolation.⁴ Given that 40 to 50% of “temporary” abdominal stomas ultimately remain permanent and unreversed, it is imperative to remain vigilant of potential pitfalls during the creation and care of the stoma.^{5,6}

II. Material And Methods

This prospective observational study was carried out on patients admitted in Department of General Surgery at Government General Hospital, Guntur, Andhra Pradesh from January 2019 to December 2020. A total of 100 patients (both male and females) of age ≥ 18 years were followed in this study.

Study Design: Prospective observational study

Study Location: This was a tertiary care teaching hospital based study done in Department of General Surgery, at Government General Hospital, Guntur, Andhra Pradesh.

Study Duration: January 2019 to December 2020

Sample size: 100 patients.

Aims and objectives: To study the rates of complications among various intestinal stomas, constructed in elective and emergency settings, and the ways they can be managed.

This could give an insight to appropriate stoma for a specific indication, how to reduce complications associated with stomas and how they can be managed effectively when they occur.

Inclusion criteria:

Patients aged above 18 years, of either sex undergoing stoma construction in both elective and emergency settings in the Department of General Surgery , Government General Hospital, Guntur.

Exclusion criteria:

1. Patients less than 18 years of age.
2. Patients undergoing a urinary stoma construction
3. Patients undergoing stoma construction for a gynaecological condition.
4. Patient who refused to give informed consent.

Procedure methodology

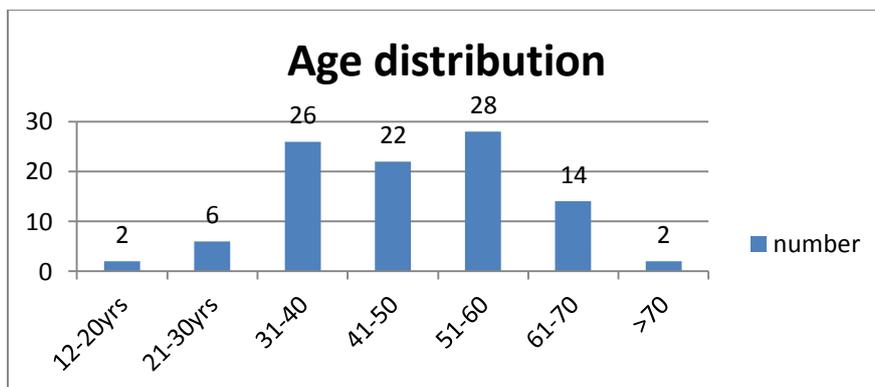
All cases undergoing soma construction in elective and emergency surgeries in various units of surgical department at our hospital were included in the study. Information regarding indication of surgery, procedure performed, date of admission, duration of stay in hospital, post operative complications, and the management of those complications was maintained.

III. Result

Data regarding various types of stomas constructed, their indications and complications, if any were collected and summarized:

Table no 1 Shows age distributions of patients studied. It was found that out of 100 patients admitted, majority of the patients were in the age group of 51 years to 60 years (28%).

Table no 1: Shows age distribution of patients admitted



Age group of patients	Number of patients
12-20 yrs	2
21-30 yrs	6
31-40 yrs	26
41-50 yrs	22
51-60 yrs	28
61-70 yrs	14
>70 yrs	2

Table no 2: shows gender distribution of patients who underwent stoma construction. Out of 100 admitted patients 73 were males and 27 were females

Table no2: Gender distribution of patients

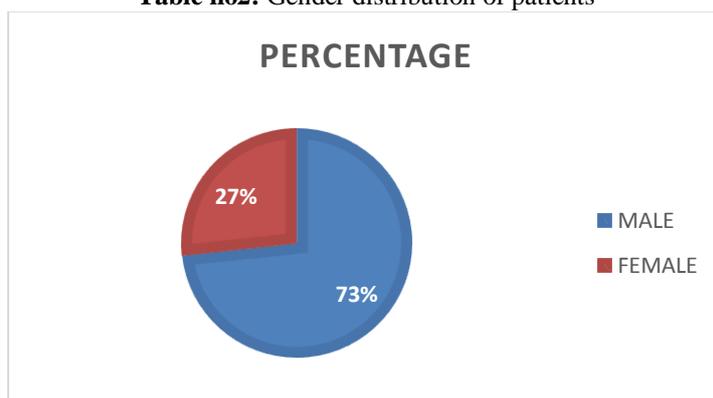


Table no3 Out of 100 patients, 48 underwent stoma construction as an elective procedure, whereas 52 patients underwent stoma construction as an emergency procedure.

Table no3

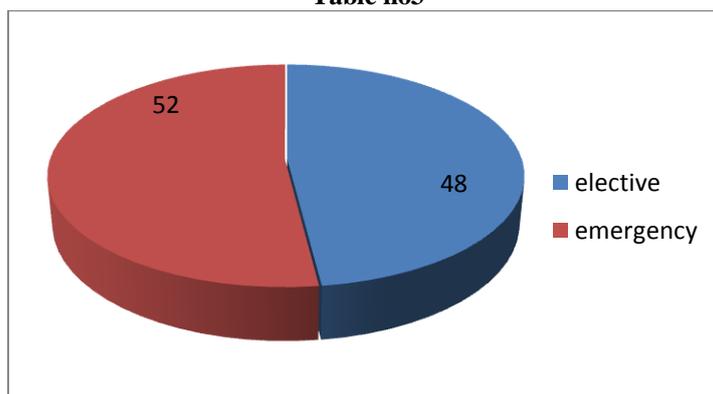


Table no4 shows the various indications for which patients had a stoma sited. The most common indication was for malignancy (24%), followed by non traumatic bowel perforation (20%)

Indication for stoma	Number of patients
Non traumatic perforation of intestine	20
Malignancy	24
Abdominal trauma	12
Enterocutaneous fistula	08
Intestinal obstruction	18
Bowel gangrene and others	18

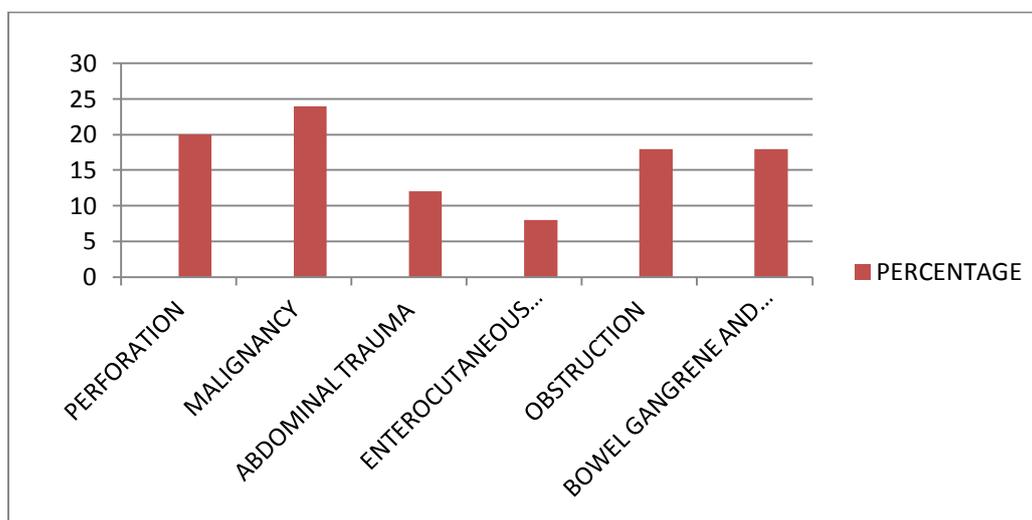


Table no 5: Types of stoma constructed The most common stoma constructed was loop ileostomy (46 out of 100), followed by end colostomy (26 out of 50). 52 patients underwent ileostomy while 48 patients underwent colostomy. Three patients underwent end ileostomy, while 26 patients underwent end colostomy either as a part of Hartmann's procedure or with an abdomino-perineal resection of anal canal carcinoma

Procedure	Number of patients
Colostomy	48
Loop colostomy	22
End colostomy	26
Ileostomy	52
Loop ileostomy	46
End ileostomy	06

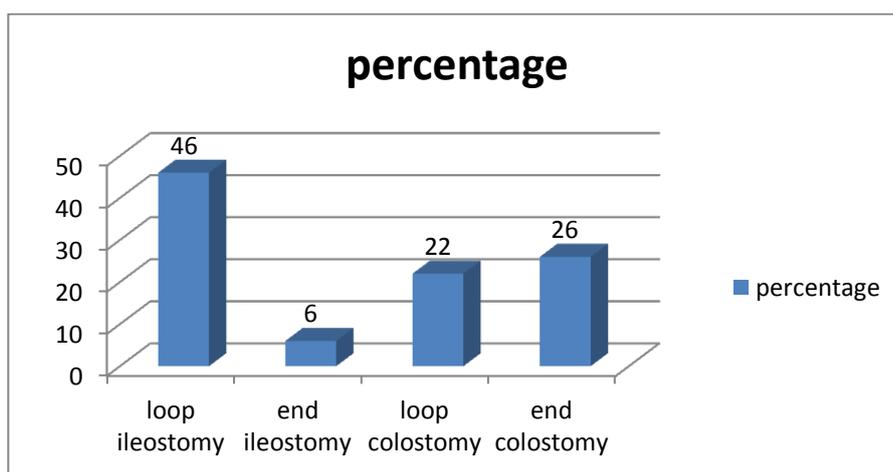


Table no 6 : Incidence of various complications encountered. Complications were encountered in 42 of the patients, with the most common being local sepsis in the form of skin excoriation. Mucosal prolapse was seen in 8 patients. Stomal necrosis, retraction and parastomal hernia were seen in 4 patients each.

Table no 6

Complication	Number of patients
Local sepsis	22
Retraction	4
Parastomal hernia	4
Mucosal prolapse	8
Stomal necrosis	4

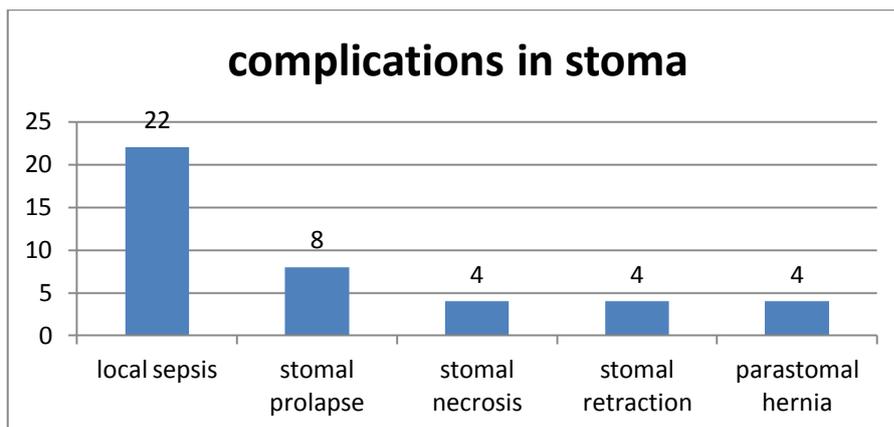


Table 7 : The incidence of complications in each type of stoma were documented separately and tabulated as below. Loop ileostomy contributed to 60 percent of all complications encountered.

Type of stoma	Number of complications encountered	Percentage of total complications
Loop colostomy	10	25
End colostomy	04	10
Loop ileostomy	24	60
End ileostomy	04	10

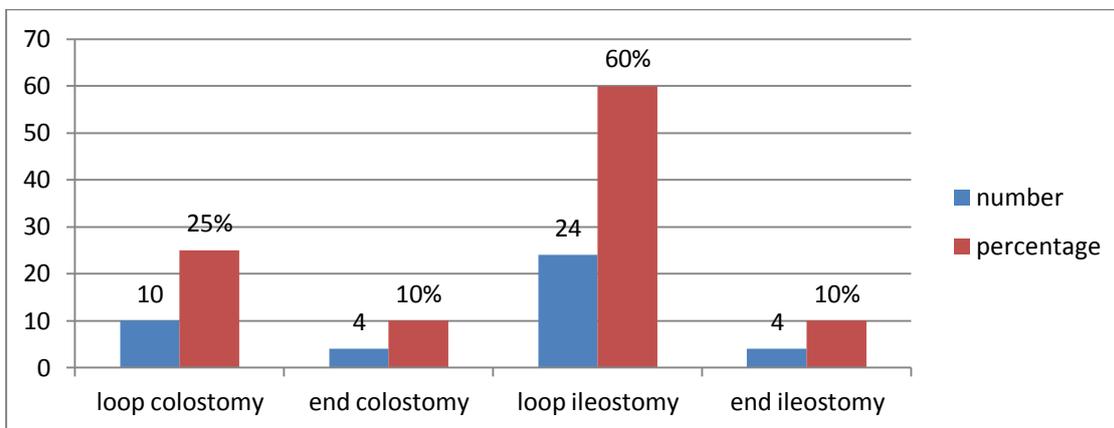


Table 8 : complications in elective versus emergency procedures: Complications were more frequent when the patients underwent stoma construction under emergency settings (n=28 out of 52, 53.84%) as compared to those undergoing stoma formation as an elective procedure (n=14 out of 48, 29.16%).

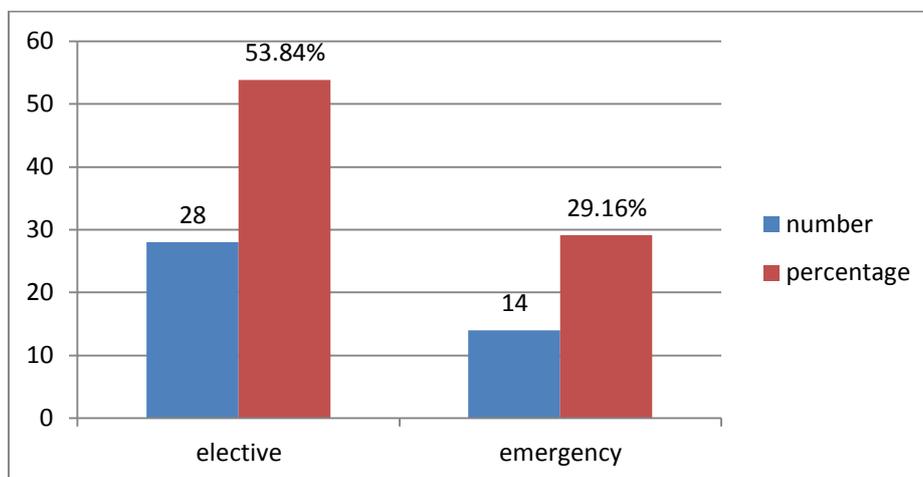
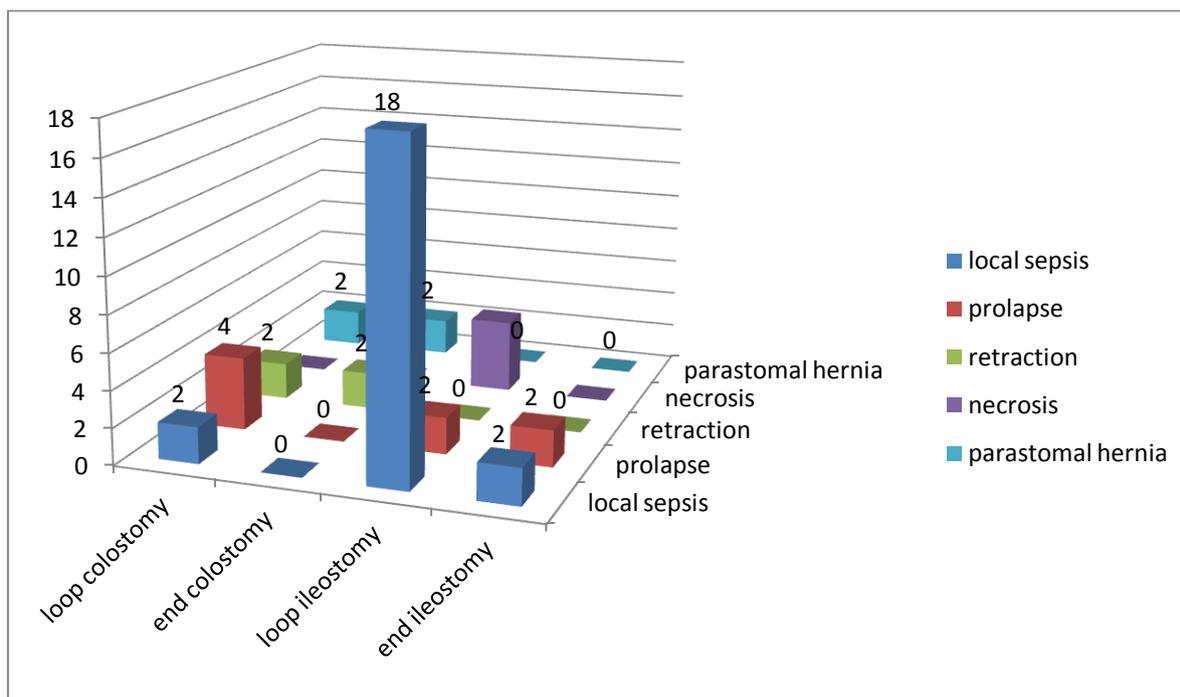


Table 9 : specific complications in each stoma type : Complications were seen more in loop colostomies and loop ileostomies as compared to other stoma types. Loop colostomy seemed to have more complications as compared to end colostomy. The most common stoma associated complication was local sepsis, followed by mucosal prolapse.



Complications	Loop colostomy (n=22)	End colostomy (n=26)	Loop Ileostomy (n=46)	End ileostomy (n=6)
Local sepsis	2(9.09%)	0	18(39.13%)	2(50%)
Retraction	2(9.09%)	2(50%)	0	0
Parastoma hernia	2(9.09%)	2(50%)	0	0
Mucosal prolapse	4(18.18%)	0	2	2(50%)
Necrosis	0	0	4	0

The above results can be summarised as follows

A total of 100 patients were included in the study who underwent stoma formation at this hospital from December 20018 to May 2020. The study includes both emergency and elective stoma formation.

- A total of 48 patients underwent colostomy formation, of which 22 were loop colostomy, and 26 were end colostomy.
- A total of 52 patients underwent ileostomy formation, of which 6 were end ileostomy, and 46 were loop ileostomy.

The most common indication for stoma formation was colorectal malignancy (n=24) followed by non-traumatic perforation (n=20)

Complications were seen in 42 of the patients undergoing stoma formation.

- local skin complications were seen in 22 patients
- Retraction was seen in 4 patients.
- Parastomal hernia in 4 patients.
- Mucosal prolapse in 8 patients
- Necrosis was seen in 4 patients.

IV. Discussion

Ileostomy or colostomy formation is an important component of many surgical procedures done for a wide range of disorders of the gastrointestinal tract. Despite the frequency with which intestinal stomas are created, stoma-related complications remain common and are associated with significant morbidity

The high prevalence of complications identified in this study is comparable with those reported by others. The reported incidence of stomal complications ranges from 2.9 to 81.1%. While the risk of developing a complication remains lifelong, the incidence is highest in the first five years after stoma formation.⁷ The incidence of complications in this study was 42 percent

In general, end ostomies, either ileostomies or colostomies, are associated with lower complications rates than loop ostomies, and loop colostomies, in particular, are associated with the highest complication rates.⁸ Few studies⁹ showed the highest complication rate with loop ileostomy. In this study also, loop ostomies had a higher complication rate, with loop ileostomy(60%) having the highest complication rate followed by loop colostomy(25%)

Peristomal skin irritation was the most frequent complication across all studies, followed by parastomal hernia or stomal prolapse. In this study, peristomal skin irritation/ local sepsis was the most common complication (55%), followed by mucosal prolapse (20%). Parastomal hernia accounted for 10% of complications. Stomal retraction and stomal necrosis accounted for 10% of complications each

PERISTOMAL SKIN COMPLICATIONS/LOCAL SEPSIS

Peristomal skin complications in aggregate occur with a reported incidence of up to 43%, and they are more commonly seen in patients with ileostomies.¹⁰ Peristomal skin complications in aggregate occur with a reported incidence of up to 43%, and they are more commonly seen in patients with ileostomies.¹⁰

In this study, they were reported with the highest incidence in loop ileostomies, followed by end ileostomies. They were managed with conservative measures such as the utilization of skin barrier rings to improve the appliance seal, topical therapy to protect the skin and promote healing, as well as utilization of convex appliances to enhance stomal protrusion and improve the seal.



Fig1: skin excoriation around a stoma

MUCOSAL PROLAPSE

While prolapse can occur with any type of ostomy, it is more common with colostomies than ileostomies, and in particular, with loop colostomies of the transverse colon, where it occurs with an incidence of 7 to 26%. It is the efferent (distal) limb, which is most often involved in the prolapse of a loop stoma.⁸

In this study, there were 8 cases of stomal prolapse, while 4 cases occurred in loop colostomy, 2 cases each occurred in loop ileostomy and end ileostomy. Various studies have failed to demonstrate a reduction in the incidence of prolapse with mesenteric or fascial fixation at the time of stoma creation.¹¹

In this study, in the cases of prolapsed mucosa in loop colostomy done, it was revised to end sigmoid colostomy. In the case of loop descending colostomy done for sigmoid growth, which prolapsed, it was revised to a loop transverse colostomy. In the remaining cases of loop ileostomy and end ileostomy presenting with prolapse, the stomas were closed, and ileo-transverse anastomosis was done.



Fig2: stomal prolapse



Fig3: mucosal prolapse

PARASTOMAL HERNIA

Parastomal hernia is usually defined as an incisional hernia that develops through the abdominal wall defect at the stoma site—which many believe as an inevitable consequence of stoma formation.¹² The incidence of clinically significant parastomal hernia with a colostomy is reported as high as 39%, with end colostomies having the highest incidence.¹³

In this study, there were 4 cases of parastomal hernia, two in loop sigmoid colostomy (done for rectal growth) and the others in end sigmoid colostomy (done for sigmoid volvulus). All were managed conservatively.

Many factors are believed to increase the rate of parastomal herniation: age, obesity, perioperative steroid use, and siting of the stoma outside the rectus muscle. The current practice supports the placement of stomas within the rectus not only to prevent herniation but also to facilitate maintenance of the appliance.¹⁴ Extraperitoneal tunneling, an alternative technique for stoma creation first described by Goligher in 1958, has been shown to be associated with a lower rate of parastomal hernia formation, particularly in patients undergoing laparoscopic abdominoperineal resection with end colostomy.¹⁵

STOMAL RETRACTION

Stomal retraction, commonly defined as a stoma that terminates > 0.5 cm below the skin surface within six weeks of formation, occurs in up to 14% of new stomas in the early postoperative period.¹⁶

In this study, there were 4 cases of stoma retraction; two occurred in an end sigmoid colostomies for sigmoid volvulus, while another two occurred in loop transverse colostomies done for rectosigmoid growth. A patient with retracted end sigmoid colostomy underwent loop transverse colostomy with closure of the sigmoid stump. The patients with retracted loop sigmoid colostomy underwent a revision of stoma.

STOMAL NECROSIS

Stomal necrosis has been reported in up to 20% of people undergoing stoma construction in the immediate postoperative period.¹⁷ Specific risk factors for stomal necrosis include emergent surgery, inadequate mobilization of the bowel, excessive mesenteric resection resulting in compromise in arterial blood supply to or venous drainage from the bowel, and constriction in the abdominal wall due to narrow openings in the fascia, abdominal wall mesh, or skin.¹⁸

In this study, 4 cases of stomal necrosis (10%) occurred, all in loop ileostomies. One of the loop ileostomies was constructed for abdominal trauma with a mesenteric tear. It was revised to an end ileostomy. Another loop ileostomy which was constructed for typhoid ileal perforation was revised.



Fig4: stomal necrosis



Fig5: stomal retraction

OTHER COMPLICATIONS

Other complications of stoma like bleeding, stenosis, intestinal obstruction, stenosis, and metabolic, fluid, and electrolyte imbalances were not encountered in this study. These complications were rare even in other studies also. The lack of reporting any occurrence in this study could be due to the small sample size ($n=100$).

EMERGENCY VERSUS ELECTIVE

Emergency surgery resulted in a higher stoma complication rate than in elective surgery and significantly higher morbidity for the patient. Our findings are consistent with those by Stothert et al. 50, who reported over 50%

morbidity and 18% mortality following emergency surgery resulting in a stoma.

V. Conclusion

Stoma construction leads to a range of complications postoperatively. Comprehensive studies on each type of stoma to study its rate of complications and the frequency of each complication in a specific type of stoma are needed to know the true risk of complications in each stoma. Good and detailed operative notes are needed to recognize specific difficulties faced during the construction of stoma and linking them to the complications resulting there-of.

An alternative to stoma formation, where possible, should always be considered due to the psychological and social stress a stoma construction brings with it. Although stoma complication is per-se a novel risk factor for mortality, it is well acknowledged that other established prognostic factors hold stronger influence like age, the urgency of surgery, and diagnosis. However, it is striking that these very factors are out of the surgeon's control and may thus explain why improvements in surgical technique alone cannot prevent complications from occurring.

References

- [1]. Harris D A, Egbeare D, Jones S, Benjamin H, Woodward A, Foster M E. Complications and mortality following stoma formation. *Ann R Coll Surg Engl.* 2005;87(6):427–431
- [2]. Shellito P C. Complications of abdominal stoma surgery. *Dis Colon Rectum.* 1998;41(12):1562–1572.
- [3]. Shabbir J, Britton D C. Stoma complications: a literature overview. *Colorectal Dis.* 2010;12(10):958–964.
- [4]. Gooszen A W, Geelkerken R H, Hermans J, Lagaay M B, Gooszen H G. Quality of life with a temporary stoma: ileostomy vs. colostomy. *Dis Colon Rectum.* 2000;43(5):650–655.
- [5]. Vermeulen J, Gosselink M P, Busschbach J J, Lange J F. Avoiding or reversing Hartmann's procedure provides improved quality of life after perforated diverticulitis. *J Gastrointest Surg.* 2010;14(4):651–657.
- [6]. Roig J V, Cantos M, Balciscueta Z. et al. Sociedad Valenciana de Cirugía Cooperativa Group . Hartmann's operation: how often is it reversed and at what cost? A multicentre study. *Colorectal Dis.* 2011;13(12):e396–e402.
- [7]. *Ann R Coll Surg Engl.* 2018 Sep; 100(7): 501–508. The incidence of stoma related morbidity – a systematic review of randomised controlled trials
- [8]. Shabbir J, Britton D C. Stoma complications: a literature overview. *Colorectal Dis.* 2010;12(10):958–964
- [9]. *Clin Colon Rectal Surg.* 2019 May; 32(3): 176–182. ; Ostomy-related complications
- [10]. Intestinal Stomas-Postoperative Stoma Care and Peristomal Skin Complications. Steinhagen E, Colwell J, Cannon LM *Clin Colon Rectal Surg.* 2017 Jul; 30(3):184-192.
- [11]. Pathophysiology and prevention of loop stomal prolapse in the transverse colon. *Maeda K, Utsumi T, Maruta M, Sato H, Masumori K, Aoyama H Tech Coloproctol.* 2003 Jul; 7(2):108-11.
- [12]. Stoma Complications. *Krishnamurty DM, Blatnik J, Mutch M Clin Colon Rectal Surg.* 2017 Jul; 30(3):193-200
- [13]. Technical Considerations in Stoma Creation. *Whitehead A, Cataldo PA Clin Colon Rectal Surg.* 2017 Jul; 30(3):162-171.
- [14]. Ludwig K A, Milsom J W, Garcia-Ruiz A, Fazio V W. Laparoscopic techniques for fecal diversion. *Dis Colon Rectum.* 1996;39:285–288
- [15]. Etherington R J, Williams J G, Hayward M W, Hughes L E. Demonstration of para-ileostomy herniation using computed tomography. *Clin Radiol.* 1990;41(05):333–336.
- [16]. Shellito P C. Complications of abdominal stoma surgery. *Dis Colon Rectum.* 1998;41(12):1562–1572.
- [17]. Kwiatt M, Kawata M. Avoidance and management of stomal complications. *Clin Colon Rectal Surg.* 2013;26(02):112–121.
- [18]. Arumugam P J, Bevan L, Macdonald L et al. A prospective audit of stomas—analysis of risk factors and complications and their management. *Colorectal Dis.* 2003;5(01):49–52

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