

A Prospective Study of Intestinal Stoma Surgery in Tribal Region of Rajasthan at M.B. Hospital, Udaipur

Krishna Gopal Sharma¹, Bheru Singh Hariyawat², Alokik Bharaduvaj³,
Jamil Mohammad⁴

¹Associate Professor, Department of General Surgery, RNT Medical College, Udaipur

²Associate Professor, Department of General Surgery, RNT Medical College, Udaipur

³Resident, Department of General Surgery, RNT Medical College, Udaipur

⁴Associate Professor, Department of Biochemistry, RNT Medical College, Udaipur

Received: 25-07-2022 / Revised: 25-08-2022 / Accepted: 15-09-2022

Corresponding author: Dr. Jamil Mohammad

Conflict of interest: Nil

Abstract

There are many indications for which stomas (both ileostomy and colostomy) are constructed. The aim of study to analyze the indication of various intestinal stomas, complications encountered during and after the creation of stoma and their management and to review the outcome. This study carried out for prospective evaluation of the patients admitted in various general surgery wards of Maharana Bhupal Government Hospital attached to RNT Medical College, Udaipur which caters tribal population of Rajasthan. The study was conducted on all patients who were operated in this institution only for creation of an intestinal stoma either as an emergency or as an elective procedure were included in the study. Total 115 cases from July 2019 to May 2022 were included in the study. In conclusion stoma constructions were high in adult and old age group, mostly surgery done as an emergency procedure compared to elective procedure. The main cause for surgery were diversion for obstruction /perforation and perforation in trauma patients. The most common stoma constructed was loop ileostomy followed by end ileostomy with mucus fistula. There is high incidence of peristomal skin excoriations complication. The complication better managed with proper preoperative planning with effective stoma care in post operative period.

Keyword: stoma, ileostomy, jejunostomy, colostomy, Obstipation, perforation.

This is an Open Access article that uses a fund-ing 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

An intestinal stoma is an artificial opening made in the colon or small intestine to divert feces and flatus outside abdomen where they can be collected in external appliance. A colostomy is a connection of the intestine or colon to the skin of the abdominal wall. An ileostomy involves exteriorization of the ileum on the abdominal skin. In rare instances, the

proximal small bowel also exteriorized as a jejunostomy. Stomas are classified temporary stoma or permanent stoma on the basis of need. Multiple factors play a role in construction of stoma rather than primary resection anastomosis. They are blood loss, peritonitis, co-morbidities of the patient, contamination, and other injuries associated with bowel injuries.

After construction of stoma, it produces multiple complications. Multiple Factors are responsible for different type of complications. They are patient's presentation, timing of surgery, preoperative education, location of stoma, ileostomy Vs colostomy, co-morbidities and quality of life (QoL). Most of the stoma complications are minor, can be managed with proper care, but major complications require intervention by means of surgery which produces high morbidity and mortality.

There are many indications which require stomas (both ileostomy and colostomy) constructed. Some for example being decompressing colostomy-constructed most often for distal obstructing lesions causing massive dilatation of the proximal colon without ischaemic necrosis. Diverting colostomy providing diversion of intestinal contents because the distal segment of the bowel has been completely resected as a part of abdomino-perineal resection done for carcinoma of rectum, due to known or suspected perforation or obstruction of the distal bowel.

A laparotomy incision usually preferable for construction of stoma, because it allow place for stoma construction on the either side of abdomen. Minimally invasive surgery like single-port laparoscopic surgery for stoma, creation is possible. It can be used for construction of ileostomies as well as colostomies, end, or loop stomas. Patients should be marked prior to surgery. Abdominal landmark used for stoma construction are called ostomy triangle. They are anterosuperior iliac spine, pubic tubercle, and umbilicus. Stoma site should be marked 5 cm away from bony prominences.

Individuals with stoma usually experience psychological problems such as depression, anxiety, changes in body image, low self-esteem, sexual problems, denial, loneliness, hopelessness, and stigmatisation. Although the purpose of stoma creation is to improve the quality of

life, inappropriate stoma site, improper management of the stoma, and stoma complications can lead to diminished QoL, social isolation, and increased medical interventions and costs. Therefore, healthcare professionals involved in stoma creation and/or care should have the fundamental and updated knowledge of the management and complications of stomas. [1,2] This is why any suggestions in the management of stoma, or change in surgical technique which seem to have merit, thereby decreasing the difficulty in adjustment to a colostomy, are well received by the patients and surgeons, and hence strong need for study regarding the various stomas, the complications associated with it and their management.

This study was conducted with the aim to analyze the indication of various intestinal stomas, to identify the complications encountered during and after the creation of stoma and their management and to review the ultimate outcome of creating an intestinal stoma.

Materials & Methods:

The study was carried out for prospective evaluation of the patients admitted in various general surgery wards of Maharana Bhupal Government Hospital attached to RNT Medical College, Udaipur which caters tribal population of Rajasthan. The study duration was from July 2019 to May 2022. The study was conducted on 115 cases. All patients who were operated in this institution only for creation of an intestinal stoma either as an emergency or as an elective procedure were included in the study. Exclusion criteria were patients operated elsewhere and referred to MB hospital, whose detailed hospital records are not available, Pediatric patients (<12 years) of intestinal obstruction and anorectal malformations and Patients undergoing urinary stoma formation and stoma formation due to gynecological indications. Creation of a particular stoma was according to the indication in a particular case. Before

closure, radiographic examination was done (barium enema/ loopogram), mechanical bowel preparation using PEG/LAC and closure was carried out under antibiotic cover.

Results:

Out of 115 patients who were included in the study, maximum numbers of patients

were in age group 31-45 (33.91%). The youngest patient in study was 15 years old and the eldest was 79 years old and 78 patients were male and 37 were female. M: F ratio was 2.1:1. The percentage of emergency surgeries was 84.35 % while elective was 15.65%.

Table 1: Patients of intestinal stoma according to presenting symptoms (n=115)

Symptoms	Frequency	%
Pain abdomen	111	96.52
Distension	88	76.52
Vomiting	69	60
Obstipation + Constipation	39	33.91
Trauma	32	27.82
Fever	18	15.65
Lump	7	6.08
Bleeding per rectum	5	4.34

In our study majority of patient presented with Pain abdomen followed by Distension, vomiting and obstipation. (Table-1)

Table 2: Radiological investigations in patients of intestinal stoma (n=115)

Radiological investigations	Radiological findings	No. of patients	%
X-ray FPA in standing position including diaphragm (n=115)	Gas under right side diaphragm	62	53.91
	X-ray air fluid level /dilated bowel loop	53	46.09
USG (n=115)	Ascites / free fluid	61	53.04
	Sluggish peristalsis with fluid fill bowel + obstruction	47	40.87
	Heterogenous mass / growth	7	6.09
CT scan (n=53)	Pneumoperitoneum	41	77.36
	Heterogenous Lump/ growth	7	13.21
	Volvulus	5	9.43

In our study radiological investigations X-ray FPA air fluid level/dilated bowel loop /gas under diaphragm present in 100% patients followed by ascites/ free fluid (53.04%) and 40.87% in sluggish peristalsis with fluid fill bowel + obstruction in USG , Pneumoperitoneum 77.36% lump in CT. (Table-2)

Table 3: Primary Indication for intestinal stoma construction (n=115)

Indications	No. of patients	Percentage
Perforation peritonitis	46	40.00
Trauma	32	27.83
Intestinal Obstruction	26	22.61
Lump / Rectal mass	7	6.08
Anastomotic leak	3	2.61
Enterocutaneous fistula	1	0.87

The frequently encountered indication of intestinal stoma formation was perforation peritonitis in 40.00% followed by trauma in 27.83% and intestinal obstruction 22.61%. (Table-3)

Table 4: Secondary Indication for intestinal stoma construction (n=115)

Indications	No. of patients	Percentage
Ileal perforation	39	33.91
Other hollow viscus perforation	23	20
Gangrenous bowel segment	21	18.26
Abdominal tuberculosis	13	11.30
Carcinoma	7	6.09
Perianal injury / laceration	5	4.35
Ileal stricture	3	2.61
Anastomic leak	3	2.61
Enterocutaneous fistula	1	0.87

The frequency of secondary indication for intestinal stoma formation is ileal perforation (33.91%) followed by other hollow viscus perforation 20%. (Table-4)

Table 5: Patients according to intestinal stoma type (n=115)

Type of intestinal stomas	No. of patients	%
Ileostomy	85	73.91
Colostomy	21	18.26
Jejunostomy	9	7.83

In our study ileostomy were constructed in 73.91% while colostomy in 18.26 % followed by Jejunostomy in 7.83%. (Table-5)

Table 6: Complications of intestinal stoma (Procedure related)

Type of intestinal stoma	No. of patients	Percentage
Loop ileostomy (n=68)	16	23.53
End ileostomy (n=5)	1	20
Double barrel ileostomy (n=12)	3	25
Loop colostomy (n=16)	5	31,25
End colostomy (n=3)	1	33.33
Double barrel colostomy (n=2)	1	50
Jejunostomy (n=9)	3	33.33

Table 7: Various complications associated with intestinal stoma (n=115)

COMPLICATIONS	NUMBER	PERCENTAGE
Skin excoriation	21	18.26
SSI	4	3.48
Enterocutaneous fistula	1	0.87
Stomal obstruction	1	0.87
Stoma necrosis	1	0.87
Stoma prolapse	1	0.87
Stoma retraction	1	0.87

Most common complication reported is skin excoriation (18.26%) followed by SSI (3.48%). (Table-7)

Table 8: Stay in hospital for intestinal stoma cases (n=115)

Hospital stay (days)	Ileostomy (n=85)		Colostomy (n=21)		Jejunostomy (n=9)	
	No.	%	No.	%	No.	%
1-10	49	57.65	16	76.19	8	88.89
11-20	32	37.65	3	14.29	1	1.11
21-30	3	3.53	1	4.76	0	0
31-40	1	1.17	1	4.76	0	0

Most of the ileostomy and colostomy cases are stay between 1-10 days. (Table-8)

Discussion:

Stomas construction remains an effective option to treat a variety of gastrointestinal and abdominal conditions. Abbas et al 2009 [3] The earliest stomas were actually unintentional ones, enterocutaneous fistulas resulting from penetrating abdominal injuries or complications of intestinal diseases such as incarcerated hernias. Kaider-Persion et al 2005 [4] Despite a great number of such surgeries done, complications are almost inevitable. Also as stated by Vonk klaasswn SM et al 2016 [5], decrease in quality of life is observed in 32-76% cases. There are numerous factors suggested to predispose to stoma complications like high body mass index, inflammatory bowel diseases, use of steroids and immunosuppressant drugs, diabetes mellitus, old age, emergency surgery, surgical technique and surgeons' experience. Arumugam et al 2003 [6]

Age:

Most of the patient's age group between 31-45 years there are likely undergoes loop ileostomy. More than 60 years of age there are likely undergoes double barrel ileostomy. In similar study Pandiaraja J et al 2021 [7] Of 100 patients, the majority of the patients belonged to 26-35 years and 46-55 years ($n = 25$)

Sex:

In this study, 67.83% (78) were male patients and 32.17% (37) were female patients. It indicates that male patients underwent more stoma construction

compares to female population. A similar study by Qamar et al, 2007 [8] in which 73 were male and 27 were female cases and similar study by Akram and Rajput et al 2011 [9] in which 76% cases were males and 23% cases were females. In study by Kilic E et al 2017 [10], it was found those females are more prone (63%) to self-esteem, marital issue and body image rather than men.

Timing of surgery (elective/emergency)

Out of 115 patients 97 (84.35%) patients underwent stoma construction as an emergency procedure compared to 18 (15.65%) patients underwent stoma construction as an elective procedure. Our finding is similar to Ahmed Z et al 2013 [11] study where 97 % ($n=100$) were emergency and rest elective. In their study most common type of stoma made was loop ileostomy (68 patients) followed by sigmoidcolostomy (11%) and transverse loop colostomy (9%).

Primary complaint and duration of complaint

All of the patients presented with complaints of abdominal pain both in emergency setting as well as elective setting (96.52%) followed by Distension in 76.52 % and vomiting in 60 %. For 115 patients durations of complaints range from less than 5 days to more than 30 days. But most of the patients presented with complaints durations less than 7 days (51.30%). Similar in a study by Laal et al (2009) [12] in which abdominal pain in 100% cases and vomiting in 43.9% cases. Another similar study by Shabana Jamal et al (2011) [13] in which pain abdomen in 100% cases, vomiting was in 71% cases,

abdominal distension in 81.5% cases and abdominal mass in 7.6 % cases. Recent study by Tsujinaka S et al 2020 [14] also aligns with 83% cases presenting with distention and 59% with vomiting.

Clinical Findings

In our study most common sign on perabdomen examination was Soft Distended which was present in 41.74 % (48) patients. Guarding and rigidity are present in 31.30 % (36) and 10.43% (12) patients respectively. This is similar to study by Ambe PC et al 2018 [15] where 67% cases had findings of soft distention and 42% presented with guarding.

Radiological Investigation

In our study radiological investigations X-ray FPA air fluid level/ dilated bowel loop /gas under diaphragm present in 100% patients followed by ascites/ free fluid (53.04 %) for USG, and 40.87% in sluggish peristalsis with fluid fill bowel + obstruction in USG, 13.21% mass in CT. Similar in a study by Laal et al (2009) [12] X -ray flat plate abdomen was positive in 80% cases. Recent study by Kreh B et al 2019 [16] aligns with X-ray findings in 78.4%, USG and CT findings in 52.6 % and 36.6 %.

Type of stoma:

Out of 115 patients the most common type of stoma constructed are ileostomies (73.91%). Among ileostomy, loop ileostomy are most common (80%), followed by double barrel ileostomy (14.12%). In colostomy most common i loop colostomy (76.19%), followed by End colostomy (14.29%). Our finding are similar to Pandiaraja J et al 2021 [17], Shah JN et al 2009 [17], Ghazi et al 2007 [18] and Safirullah et al 2003. [19]

Indication for stoma construction

In our study the most common Primary indications for stoma construction are Perforation peritonitis (40%) followed by Trauma (27.83%) and Intestinal Obstruction (22.61%). Our findings are

different from PORTER JA et al [20] and AKEEL M. A. AL-FAHAM et al [21] who find most common cause as malignant tumors. AKRAM RAJPUT et al [9] found Enteric fever as most common cause.

Complications of stoma:

Out of 115 patient's 30 (20.00%) patients developed complications. The most common complication observed in stoma construction was skin excoriations in 21 (70%) patients, followed by Surgical site infection in 4 (13.33%) similar to study by Pearl (2003) [22], Duschesne 1999 [23] and Harris 2001 [24] who reported complications in 26%, 25% and 25% cases respectively. The degree of irritation ranges from mild peristomal dermatitis to full thickness skin necrosis to ulceration. The study by B Mahjoubi et al [25] 2005 who reported complications in 70% patients. Loop ileostomy is considered generally easier to manage and have lesser rate of complications (in its construction and closure). Wexner SD et al 2004 [26] reported a complication rate of 41% associated with loop ileostomy construction, with 6% requiring surgical intervention. Colostomy associated with high parastomal hernia and other stomal complication, compared to peristomal skin related complications are high in ileostomy. Apart from these peristomal complications, the systemic complications like electrolyte disturbances and gaping of the main wound have been reported in much higher incidence in ileostomy in our study. Katia et al 2004 [27] reported higher overall complication rate with ileostomy.

Duration of hospital stay:

Most of the colostomy cases stay between 1-10 days are (76.19%) and 11-20 days are 14.29% while ileostomy cases 1-10 days are 57.65%, 11-20 days are 37.65%. A study by Ahmad QA et al [28] where hospital stay ranges from 10- 60 days with median being 28 days. Forsmo HM et al

2016 [29] where median age decreased from 9 days to 6 days on following ERAS pathway. However, a longer duration of hospital stay is not necessarily a drawback, particularly since in view of the fact that there is a death of preoperative counseling by a professional stoma therapist in the local setting, the exaggerated stay in hospital could be utilized for preparing the patient for stoma. [30]

Conclusions:

In conclusion the study showed stoma construction high in adult and old age group, mostly done as an emergency procedure compared to elective procedure. Mostly done for diversion for obstruction/perforation and perforation in trauma patients. Most common stoma constructed was loop ileostomy followed by end ileostomy with mucus fistula. There is high incidence of peristomal skin excoriations complication related to loop ileostomy. The complication better managed with proper preoperative planning with effective stoma care in post operative period.

References:

1. Salvadalena G et al. WOCN Society and ASCRS Position Statement on Preoperative Stoma Site Marking for Patients Undergoing Colostomy or Ileostomy Surgery. *J Wound Ostomy Continence Nurs.* 2015 May-Jun; 42 (3): 249-52.
2. Husain SG et al. Late stomal complications. *Clin Colon Rectal Surg.* 2008 Feb; 21(1): 31-40.
3. Abbas MA, Tejirian T. Laparoscopic stoma formation. *JLS* 2009; 12: 159-161.
4. Kaider-Person O, Person B, Wexner SD. Complications of construction and closure of temporary loop ileostomy. *J Am Coll Surg* 2005; 201:759-73.
5. Vonk-Klaassen SM, de Vocht HM, den Ouden ME, Eddes EH, Schuurmans MJ. Ostomy-related problems and their impact on quality of life of colorectal cancer ostomates: a systematic review. *Qual Life Res.* 2016; 25:125–133.
6. Arumugam PJ, Bevan L, Macdonald L, Watkins AJ, Morgan AR, Beynon J et al. A prospective audit of stomas – analysis of risk factors and complications and their management. *Colorectal Dis* 2003; 5:49-52.
7. Pandiaraja J, Chakkarapani R, Arumugam S. A study on patterns, indications, and complications of an enteric stoma. *J Family Med Prim Care.* 2021 Sep;10(9):3277-3282. PMID: 34760744.
8. Qamar SD. Same admission colostomy closure (SACC). A new approach to rectal wounds: a prospective study *Ann Surg* 2007 Sep; 289(3): 279-97.
9. Rajput A, Samad A, Khanjada TW. *Med J* 2011; 32:159-162.
10. Kiliç E et al. [The effect of permanent ostomy on body image, self-esteem, marital adjustment, and sexual functioning]. *Turk Psikiyatri Derg.* 2007 Winter;18(4):302-10. Turkish. PMID: 18066721.
11. Ahmad Z, Sharma A, Saxena P, Choudhary A, Ahmed M. A clinical study of intestinal stomas: Its indications and complications. *Int J Res Med Sci.* 2013;1:536
12. Laal M. Caecostomy in the management of acute left colonic obstruction. *Acta Chir Beig* 2009; 105 (8): 212-215.
13. Shabana J, Singh K, Kohli JS. Choice of surgical procedure in typhoid perforation: experience in 42 cases. *J Indian Med Assoc* 2011; 100:289.
14. Tsujinaka S et al. Current Management of Intestinal Stomas and Their Complications. *J Anus Rectum Colon.* 2020 Jan 30; 4(1):25-33.
15. Ambe PC et al. Intestinal Ostomy. *Dtsch Arztebl Int.* 2018;115(11):182-187.
16. Krebs B, Ivanecz A, Potrc S, Horvat M. Factors affecting the morbidity and mortality of diverting stoma closure:

- retrospective cohort analysis of twelve-year period. *Radiol Oncol*. PMID: 31553701; PMID: PMC6765168.
17. Jay N S, Subedi N, Maharjan S. Stoma Reversal, a hospital based study of 32 cases. *Internet journal of surgery* 2009;22(1).
 18. Ghazi GM. Colostomy indications: Management and complications. *J Indian Med Assoc* 2007; 256:56.
 19. Safirullah, Mumtaz N, Jan MA, Ahmed S. Complications of intestinal stomas. *J Postgrad Med Inst* 2005; 19 (4):407-11.
 20. Porter JA, Salvati EP, Rubin RJ, Eisenstat TE. Complications of colostomies. *Dis Colon Rectum*. 1989 Apr;32(4):299–303.
 21. Sheikh MA, Akhtar J, Ahmed S. Complications / problems of colostomy in infants and children. *J Coll Physicians Surg--Pak JCPSP*. 2006 Aug;16(8):509–13.
 22. Pearl RK. The origins and evaluation of colostomy. 2003; 22:142-54.
 23. Duschesne MR. Management of the ileostomy. *AMJ Surg* 1999 Nov; 617-24.
 24. Harris GJ. Dermatological complications in colostomy and ileostomy patients. *Surgery* 2001 Mar; 29(2):129-33.
 25. Mahjoubi B, Moghimi A, Mirzaei R, Bijari A. Evaluation of the end colostomy complications and the risk factors influencing them in Iranian patients. *Colorectal Dis* 2005; 7:582-587.
 26. Wexner SD, Taramaw DA. Loop ileostomy is a safe option for temporary fecal diversion. *Dis Colon Rectum* 2004; 36:349-354.
 27. Katia Allison, Corman. Morbidity of colostomy closure. *Am J Surg* 1997; 132:304-6.
 28. Ahmad QA, Saeed MK, Muneera MJ, Ahmed MS, Khalid K. Indications and complications of intestinal stomas-a tertiary care hospital experience. *Biomedica*. 2010 Jul;26(2):144-7.
 29. Forsmo HM, Pfeffer F, Rasdal A, Sintonen H, Körner H, Erichsen C. Pre- and postoperative stoma education and guidance within an enhanced recovery after surgery (ERAS) programme reduces length of hospital stay in colorectal surgery. *Int J Surg*. 2016 Dec;36(Pt A):121-126.PMID: 27780772.
 30. Diane S., Baldé A. K., Camara F., & Diane M. H. Problématique du traitement de limbo-conjonctivite et endémique des tropiques. *Journal of Medical Research and Health Sciences*, 2022;5(9): 2244–2249.