

A study of morbidity of temporary loop ileostomy in cases of perforation peritonitis

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Abstract

Introduction: Despite significant advances in surgery, the development of an intestinal stoma remains a common and regularly performed treatment. Stoma care has become a significant concern in our country as a result of poverty, ignorance, and the inaccessibility of stoma appliances, particularly among the poor. This study aims to determine the causes of morbidity, as well as, associated complications occurring in patients requiring diversion ileostomy in cases of perforation peritonitis, within the first eight weeks after creation.

Materials and Method: The present study was carried out in Department of General Surgery, GMC, Bhopal, after approval from IEC among 130 cases of perforation peritonitis requiring operative intervention including loop ileostomy creation. Data was collected, recorded and coded in MS Excel spreadsheet and analysed using IBM

Corp's SPSS v23. Statistical significance was kept at $p < 0.05$.

Results: 70% of the study participants who underwent loop ileostomy were < 40 years of age. Mean age for stoma-related complications was 42.3 ± 18.4 years. 77.2% females and 22.8% males had stoma-related complications. 32.3% were overweight. Statistically significant association between history of Comorbidities and development of stoma complications ($p = 0.002$) was observed. A larger proportion of participants had a past history of Tuberculosis. Tubercular perforation of ileum was the most common etiology and a significant association between pathology and complication related to stoma was observed ($p = 0.026$). 76.2% of 130 patients who had undergone loop ileostomy were operated on an emergency basis while 23.8% were routine cases. 63.2% of 99 emergency cases had stoma complications ($p = 0.002$). Significant difference was found between

nutritional status and stoma complications (p=0.0005). Most common consequence was skin irritation.

Conclusion: Post-operative education regarding stoma care, ensuring proper psychological support & emphasis on counseling and resumption of normal activity plays a vital role in reducing post-operative complications. Multidisciplinary follow up also helps in seeking out complications and associated morbidities at an earlier time associated with these procedures.

Keywords: Stoma, Complications, Ileostomy, Perforation Peritonitis, Morbidity.

Introduction:

Ileostomy, a common surgical procedure, involves creating an external passage between the distal part of the small intestine and the abdominal wall. The purpose of a temporary loop ileostomy is to provide defunctioning in potentially fatal anastomotic problems. Faecal diversion via a temporary stoma can help to lessen the symptoms of anastomotic leak as well as the number of leak-related interventions.^[1-4] Complications in ileostomy patients can be noted in more than 70% patients^[5]. Stoma-related complications might appear early or late, intermittently or steadily, and be acute or chronic. Despite significant advances in surgery, the development of an intestinal stoma remains a common and regularly performed treatment. To get successful results, it is necessary to follow meticulously sound surgical principles. Whether permanent or temporary, the thought of stoma is frightful and anxiety-provoking. It is essential to alleviate the patient's worry of living with a stoma by adequate counseling and providing literature on their ailment and prospective surgery. Stoma care has become a significant concern in our country as a result of poverty, ignorance, and the inaccessibility of stoma appliances, particularly among the poor. After the advances of stoma therapists

and better nursing care, these problems have been reduced to a greater extent and improved patients' quality of life. However, still, it's significant problem in rural India. This study aims to determine the causes of morbidity, as well as, associated complications occurring in patients requiring diversion ileostomy in cases of perforation peritonitis, within the first eight weeks after creation because this is when the majority of psychological factors, metabolic, and mechanical complications occur.

Materials and Methods

The present study was carried out in the Department of General Surgery, Gandhi Medical College, Bhopal, after approval from the Institutional Ethics Committee. A total of 130 consented patients diagnosed with perforation peritonitis requiring operative intervention including loop ileostomy creation, aged between 13 to 90 years, who presented to the department between October 2019 and September 2021 were included in the study. Patients aged less than 12; life expectancy <1 year; those underwent double barrel ileostomy, permanent ileostomy, split ileostomy, colostomy, sigmoid colostomy; with complications even after 8 weeks of ileostomy creation; and those diagnosed with malignancy on exploration or histopathological examination were excluded from the study.

A detailed history of each patient was recorded and complete physical examination done. All the necessary blood and radiological investigations were carried out. Pre-operative counseling, psychological preparation and marking for adequate stoma was done by the operating resident surgeon. Participants were constantly monitored for complications for the first 7 days after surgery, then every 2 weeks until the eighth week (i.e., at 4th, 6th, and 8th week after surgery). On an outpatient basis, the incidence, nature, and rate of complications were

monitored and handled optimally, and if there was any indication for complications, patients were readmitted. The body mass index (BMI) was measured at the time of admission or within two days of surgery and then on a weekly basis after that.

Statistical Analysis: Data was collected, recorded and coded in MS Excel spreadsheet. For data analysis, IBM

Result

Table 1: Association between stoma complications and various parameters

Parameters	Stoma Complications			P-value
	Present	Absent	Total	
Age (in years)				
<=20	8 (14.0%)	18 (24.7%)	26 (20.00%)	0.026
21-30	12 (21.1%)	25 (34.2%)	37 (28.50%)	
31-40	11 (19.3%)	17 (23.3%)	28 (21.50%)	
41-50	06 (10.5%)	06 (8.2%)	12 (9.20%)	
51-60	10 (17.5%)	05 (6.8%)	15 (11.50%)	
61-70	05 (8.8%)	02 (2.7%)	07 (5.40%)	
71-80	04 (7.0%)	00 (0.0%)	04 (3.10%)	
>=80	01 (1.8%)	00 (0.0%)	01 (0.8%)	
Mean ± SD	42.3±18.4	31.2±12.5	-	
Gender				
Male	13 (22.8%)	19 (26.0%)	32 (24.6%)	0.672
Female	44 (77.2%)	54 (74.0%)	98 (75.4%)	
BMI				
Underweight (<18.5)	3 (5.3%)	4 (5.5%)	7 (5.4%)	0.985
Normal (18.5-22.9)	36 (63.2%)	45 (61.6%)	81 (62.3%)	
Overweight (>23)	18 (31.6%)	24 (32.9%)	42 (32.3%)	
Co-morbidities				
Yes	41 (71.9%)	37 (50.7%)	78 (60%)	0.002
No	16 (28.1%)	36 (49.3%)	52 (40%)	
Type of case				
Emergency	36 (63.2%)	63 (86.3%)	99 (76.2%)	0.002
Routine	21 (36.8%)	10 (13.7%)	31 (23.8%)	
Pathologies				
Typhoid ileal perforation	04 (7.00%)	22 (30.1%)	26 (20%)	0.026
Ileocaecal Tuberculosis	12 (21.1%)	06 (8.2%)	18 (13.8%)	

Tubercular ileal perforation	17 (29.8%)	23 (31.5%)	40 (30.8%)	
Ileal Stricture	09 (15.8%)	06 (8.2%)	15 (11.5%)	
Ileocaecal mass	05 (8.8%)	08 (11.0%)	13 (10%)	
Tubercular caecal perforation	02 (3.5%)	03 (4.1%)	05 (3.8%)	
Blunt trauma abdomen	07 (12.3%)	04 (5.5%)	11 (8.5%)	
Colonic perforation	01 (1.8%)	01 (1.4%)	2 (1.5%)	
Infection				
None	41 (71.9%)	57 (78.1%)	98 (75.4%)	0.137
Wound Infection	10 (17.5%)	15 (20.5%)	25 (19.2%)	
Septicaemia	02 (3.5%)	00 (0.0%)	02 (1.5%)	
Wound infection+Septicaemia	04 (7.0%)	01 (1.4%)	05 (3.8%)	
Chest complications				
Present	34 (59.6%)	69 (94.5%)	103 (79.2%)	0.51
Absent	23 (40.4%)	04 (5.5%)	27 (20.8%)	
Nutrition				
Normal	15 (26.3%)	60 (82.2%)	75 (57.7%)	0.0005
Low weight (LW)	00 (0.0%)	04 (5.5%)	04 (3.1%)	
Low albumin (LA)	18 (31.6%)	09 (12.3%)	27 (20.8%)	
LW+LA	24 (42.1%)	00 (0.0%)	24 (18.5%)	
Other surgical complications				
None	42 (73.7%)	73 (100%)	115 (88.5%)	0.0005
Surgical site infection (SSI)	12 (21.1%)	00 (0.0%)	12 (9.2%)	
Abdominal dehiscence (AD)	02 (3.5%)	00 (0.0%)	02 (1.5%)	
SSI+AD	01 (1.8%)	00 (0.0%)	01 (0.8%)	
Total	57	73	130	

Table 2: Association between complications and pre-op Comorbidities

Weeks	Parameters	Comorbity (Pre-op)			P-value
		Present	Absent	Total	
Skin Irritation (Peristomal Dermatitis)					
Week 1	Present	18 (23.7%)	9 (16.7%)	27 (20.8%)	0.331
	Absent	58 (76.3%)	45 (83.3%)	103 (79.2%)	
Week 2	Present	16 (21.1%)	14 (25.9%)	30 (23.1%)	0.516
	Absent	60 (78.9%)	40 (74.1%)	100 (76.9%)	
Week 4	Present	11 (14.5%)	9 (16.7%)	20 (15.4%)	0.733
	Absent	65 (85.5%)	45 (83.3%)	110 (84.6%)	
Week 6	Present	13 (17.1%)	12 (22.2%)	25 (19.2%)	0.466
	Absent	63 (82.9%)	42 (77.8%)	105 (80.8%)	
Week 8	Present	22 (28.9%)	12 (22.2%)	34 (26.2%)	0.390

	Absent	54 (71.1%)	42 (77.8%)	96 (73.8%)	
Prolapse					
Week 4	Present	1 (1.3%)	0 (0.0%)	1 (0.8%)	1.000
	Absent	75 (98.7%)	54 (100%)	129 (99.2%)	
Week 6	Present	1 (1.3%)	0 (0.0%)	1 (0.8%)	1.000
	Absent	75 (98.7%)	54 (100%)	129 (99.2%)	
Week 8	Present	1 (1.3%)	0 (0.0%)	1 (0.8%)	1.000
	Absent	75 (98.7%)	54 (100%)	129 (99.2%)	
Necrosis					
Week 1	Present	4 (5.3%)	1 (1.9%)	5 (3.8%)	0.402
	Absent	72 (94.7%)	53 (98.1%)	125 (96.2%)	
Total		76 (100%)	54 (100%)	130 (100%)	-

Discussion

In the present study, more than half of the patients (70%) who underwent loop ileostomy belonged to the most active group i.e. <40 years. The mean age for stoma-related complications was 42.3±18.4 years. Similar age distribution was reported by **A. Hassan A et al**^[6](mean=42.5 years) and **Akram Rajput et al**^[7](mean=36±12.58 years). 32 of the participants were male out of which 13 (40.6%) male had stoma-related complications; whereas 98 patients were females, out of which only 44 (44.9%) females had stoma-related complications. Complications related to stoma were present in 18 of 42 overweight patients. **Kwiatt M et al**^[8]observed that high BMI did not have any effect on outcome. **Beck SJ**^[9]observed obese patients have higher rate of wound infection, wound dehiscence and anastomotic leak; and also suffer a higher rate of stoma-related complications **Arumugam PJ et al**^[10]found that obesity presented independent risks for complications. However, we did not find a significant association between BMI and stoma-related complications (p=0.985). We observed a statistically significant association between history of comorbidities (diabetes mellitus, abdominal TB, hypertension, typhoid etc.) and

development of stoma complications (p=0.002). In our study, a larger proportion of participants had a past history of Tuberculosis. **Chaudhary P et al**^[11] found that presence of comorbidities was associated with increased rate of stomal and other systemic complications. **Nastro P et al**^[12]assessed that respiratory comorbidities, smoking, diabetes, and malignancy were associated with highest risk for post-operative stomal complications. **Arumugam PJ et al**^[10] found that the presence of diabetes presented independent risks for complications. On studying the pathologies leading to formation of temporary stomas, we found that Tubercular perforation of ileum was the most common etiology and a significant association between pathology and complication related to stoma was observed (p=0.026). Similarly, **Ahmad Q et al**^[13] found that main indications of Ileostomy were intestinal tuberculosis (58%), enteric perforation (31%), and penetrating injuries (5.5%). In contrast, **Chaudhary P et al**^[11]and **Akram Rajput et al**^[7]discovered that Typhoid perforation was most common. Others included tuberculosis, trauma and intestinal obstruction with gangrenous bowel. In present study, 76.2% of 130 patients who had undergone loop ileostomy were operated on an emergency basis while

23.8% were routine cases. 63.2% of 99 emergency cases had stoma complications, while 36.8% of 31 routine cases had stoma complications. This variation was statistically significant ($p=0.002$). Similarly, **Pandiaraja J et al** ^[14] observed among 100 patients, 79 and 21 patients underwent stoma creation as an emergency procedure and elective procedure respectively. **Chaudhary P et al** ^[11] observed a higher complication rate in patients presenting with shock at emergency. **Kwiatt M et al** ^[8] and **Arumugam PJ et al** ^[10] discussed that emergency surgery presented independent risks for complications. In contrast, **Robertson I et al** ^[15] observed that both elective and emergency stomas had similar complication rates. Association of stoma-related complications with chest complications ($p=0.51$) and infection ($p=.137$) was found insignificant in the present study. However, **Nastro Pet al** ^[12] found that respiratory comorbidities were associated with the highest risk for postoperative stomal complications. A significant difference was found between nutritional status and stoma complications ($p=0.0005$) in present study, implying that patients with abnormal nutritional status had more stoma complications. Similarly, **Kim et MS al** ^[16] found that severe malnutrition level (albumin <2.8 mg/dL) was statistically significant in increasing risk of complications ($P=0.015$).

In present study, most common consequence was skin irritation. Skin excoriation as a common complication was also reported by **Pandiaraja J et al** ^[14](52.4%), **Ambe PC et al** ^[17], **Ahmad Q et al** ^[13](25%), **A. Hassan A et al** ^[6](45.25%) and **Akram Rajput et al** ^[7](21.4 %). In present study, one patient developed Prolapse every week and each one had pre-op comorbidity. But the association was not statistically significant. **Ambe PC et al** ^[17] reported that stoma prolapse is the most common

late complication, with an incidence of 8–75% In present study, there was no statistically significant association between necrosis of loop ileostomy and comorbidity. **Park JJ et al** ^[18] observed that partial necrosis was among the most prevalent early consequences. Other complications like Peristomal Abscess, Fistula, Retraction, Granulomas, Parastomal Hernia, and Ileostomy Stenosis were absent in our study population.

Conclusion

Surgery of creating a stoma and its complications postoperatively is more common in cases with perforation peritonitis. It affects patient's quality of life and its well-being while bearing a stoma. Ileostomy is frequently associated with post-operative complications. Early intervention and meticulous care and attention to advanced techniques and methods will reduce the post-operative stoma related complication. Post-operative education regarding stoma care, ensuring proper psychological support & emphasis on counselling and resumption of normal activity plays a vital role in reducing post-operative complications. Multidisciplinary follow up also helps in seeking out complications and associated morbidities at an earlier time associated with these procedures.

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