Original Research Article

A study on stomas in emergency laparotomies

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Abstract

Background: Stoma is a surgically made intestinal opening on the anterior abdominal wall. Its common forms include colostomy and ileostomy. Shock, marked blood loss, significant fecal contamination, associated injuries, time till presentation and multiplicity of injury are widely accepted factors favoring stoma formation than primary repair which leads to significant mortality and morbidity owing to friable tissue that cannot hold a suture.

Aims and objectives: To study the various etiologies for stomas in emergency laparotomies, to assess the postoperative morbidity and mortality and its relation to cause and type of stoma done.

Materials and methods: This observational study was done in Madras medical college and Rajiv Gandhi Government Hospital from 2013-2016. Method of sampling was non-random, purposive. Those patients who had undergone emergency stomas were included in this study. Informed written consent was taken from the patients or their guardian willing to participate in the study. A detailed history was taken from the study group to establish a proper diagnosis. Thorough physical examination was done in each case. Data collection sheets were filled in by the investigator himself. The operation procedure and related preoperative factors were observed directly and recorded in the data collection sheet instantly. After completing the collection of data it was compiled in a systematic way and analyzed.

Results: The common procedures performed included primary closure of a perforation in case of small isolated perforations with not much contamination. Resection followed by either anastomosis or stomas was done in most of the patients with malignant obstruction or nonviable or ischemic bowel. Even in those patients who had anastomosis, a covering stoma was placed as the healing process in these patients may be impaired.

Conclusion: Abdomen injuries due to blunt and penetrating trauma and acute bowel pathologies leading to peritonitis such as bowel perforations are the leading. More the lag period from the onset of symptoms/trauma to the theatre, more is the incidence of stoma as anastomotic leakage is more common in this group. Postoperative patient education and counseling are of utmost importance as there is no hope for prior sensitization in emergency settings. Adequate hydration, electrolyte correction, nutrition management, and psychological support teams play a crucial role in bringing a significant number of patients for reversal.

Key words

Stomas, Laparotomies, Acute Intestinal Obstruction, Carcinoma Colon.

Introduction

Stoma is a surgically made intestinal opening on the anterior abdominal wall. Its common forms include colostomy and ileostomy. History of Stomas dates back to 1710 when Littre of Paris made first ventral colostomy for imperforate anus [1]. After World War I a mortality rate of 60% due to primary repair of colonic injuries dropped to 30% in World War II due to the introduction of colostomy. Ileostomy gained popularity for a ruptured appendix and appendicular abscess [2]. Shock, marked blood loss, significant fecal contamination, associated injuries, time till presentation and multiplicity of injury are widely accepted factors favoring stoma formation than primary repair which leads to significant mortality and morbidity owing to friable tissue that cannot hold a suture [3]. The number of abdominal stomas made each year is declining in UK and West where indications for fecal diversion include inflammatory bowel disease, familial adenomatosis polyposis, colorectal cancer, non-gastrointestinal obstructing tumors, pelvic sepsis, trauma, diverticulitis, fistula, ischemic bowel disease, radiation enteritis, pseudomembranous enterocolitis, fecal incontinence, and paraplegia but in developing countries it is still a common occurring for infective etiologies [4]. Stoma actually serves the purpose of decompression, lavage, diversion, and exteriorization in the set of odds and can be temporary or permanent [5]. Major indications of ileostomy include diffuse bowel pathology that precludes primary anastomosis like gross peritonitis, intestinal obstruction, radiation enteritis, ischemia, and inflammatory bowel diseases and rectal causes. A colostomy is made in a colonic obstruction (primarily due to cancer of distal colon/rectum), perforation with peritonitis, recto-vaginal fistulas, and perianal sepsis [6]. Stoma formation causes social, domestic and many physiological upsets. But after the indulgence of stoma therapist and better nursing care and better stoma appliances alleviated these problems to a greater extent and improved the quality of the patient's life. Stoma has various complications like bleeding, retraction, prolapsed, parastomal hernia, and stenosis [7]. Bleeding is one of the most common complications which usually occur from the margins of the stoma or from the cutting muscles. Retraction of the stoma is the putting back of intestine into the abdomen. Prolapsed is protrusion of the gut from the stoma mouth [8]. Parastomal hernia is the outward herniation of the portion of intestine from the side of the stoma. Stenosis is one of the rare and late complications in which lumen of the stoma become narrow due to fibrosis or tightening of the skin [9]. A troublesome can bring about social, domestic and psychological upsets. Some studies have shown that a patient's attitude and lifestyle was not impaired, although others have suggested difficulties in as many as 45% of cases. The use of mechanical sutures, the dedication, and skill of nursing staff and stoma therapies and improvement in colostomy appliances have helped to improve the quality of life of patients with a stoma [10].

Materials and methods

This observational study was done in Madras Medical College and Rajiv Gandhi Government Hospital from 2013-2016. Method of sampling was non-random, purposive. Those patients who had undergone emergency stomas were included in this study. Informed written consent was taken from the patients or their guardian willing to participate in the study. A detailed history was taken from the study group to establish a proper diagnosis. Thorough physical examination was done in each case. Data collection sheets were filled in by the investigator himself. The operation procedure and related preoperative factors were observed directly and recorded in the data collection sheet instantly. After completing the collection of data it was compiled in a systematic way and analyzed.

Statistical analysis: Data analysis was done both manually and by using a computer. Calculated data were arranged in a systemic manner, presented in various table and figures and statistical analysis was made to evaluate the objectives of this study with the help of Statistical Package for Social Science (SPSS).

Results

Sixty patients fulfilling the inclusion criteria from the Surgery Department of Madras Medical College and Rajiv Gandhi Government General Hospital were selected. All cases were evaluated clinically. Only essential investigations necessary for diagnosis and preoperative assessment were carried out before operations. All patients underwent surgery as warranted in their case. The patients of both sexes and different ages were included in the study.

Table - 1: Age and sex distribution of patients.

Age in years	Male	Female	Total
18 - 29	9	4	13
30 - 39	10	6	16
40 - 49	17	10	27
50 - 59	15	4	19
Total	51	24	75

Table - 2: Prevalence of comorbid factors inpatient group.

Co-Morbid Factor	Number	%
Diabetes Mellitus	9	12
Hypertension	3	4
DM & HTN	2	2.67
TB / BA	5	6.67
CAD	2	2.67
CKD	1	1.33
No Comorbidity	53	70.67
Total	**75**	**100**

Table - 3: Diagnosis of patients who underwent emergency stomas.

Diagnosis	Numbers	%
Acute Intestinal Obstruction	8	10.67
Appendicular Pathology	2	2.67
Blunt Injury Abdomen	10	13.33
Penetrating Injury Abdomen	6	8
Carcinoma Colon	8	10.67
Small Bowel Perforation	22	29
Large Bowel Perforation	5	6.67
Sigmoid Volvulus	3	4
Obstructed Hernia	7	9.33
SMA Thrombosis	4	4.33
Total	**75**	**100**

Table - 4: Intraoperative findings in the patient group.

Intraoperative findings	Numbers	%
Obstruction	33	44
Perforation	42	56
Site		
Small Bowel	44	58.67
Large Bowel	31	41.33

Age of 75 patients ranged from 18-60 years. The patients were nearly equally distributed among all the age groups with slightly more preponderance in people over 40 years of age. The male to female ratio was ~2: 1. So, it can be assumed that males are the predominantly involved group (**Table – 1**).

On analyzing the comorbid factors, as expected, Diabetes Mellitus was the predominant comorbid factor, seen in 9 patients (13.3%), with systemic

hypertension seen in three patients (5%). Other factors like CKD, CAD etc. were seen in another eight patients (**Table – 2**).

Table - 5: Distribution of procedure underwent by patients in the study.

Procedure	**Numbers**	**%**
Primary Closure with Loop Ileostomy	8	10.67
Resection and Anastomosis with Covering Stoma	21	28
End Ileostomy	10	13.33
Double Barrel Ileostomy	16	21.33
End Colostomy	15	20
Double Barrel Colostomy	5	6.67

Table - 6: Prevalence of morbidity among the patient group.

Morbidity	**Numbers**	**%**
Acute Kidney Injury	3	4
Anastomotic Leak	3	4
Basal Atelectasis	5	6.67
Pulmonary Embolism	2	2.67
Dyselectrolytemia	12	16
Wound Dehiscence	8	10.67
Wound Infection	5	6.67
Deep venous thrombosis	2	2.67
No Morbidity	35	46.67
Total	**75**	**100**

On the evaluation of patients, eight patients presented with acute intestinal obstruction while sixteen people presented with trauma either blunt or penetrating. Small bowel perforation was the predominant reason for performing stomas in this study with more than thirty percent of the patients undergoing stomas for the same. Obstructed hernia, Sigmoid Volvulus, Carcinoma Colon and SMA thrombosis with bowel gangrene being the other common indications for stomas in our study (**Table – 3**).

Proceeding to intraoperative findings, thirty-three patients had features of intestinal obstruction, due to either strictures, malignancy, volvulus or bowel adhesions. Forty patients presented with perforation. There were multiple perforations in nine patients. Small bowel involvement was seen in forty-four patients while large bowel was involved in thirty-one patients (**Table – 4**).

Regarding the procedures performed, eight patients (10%) had primary closure of their ileal perforations, with twenty-one patients having resection of the obstructed or perforated segment of ileum with anastomosis of the cut ends and a covering stoma. Another ten patients had resection with end ileostomy while sixteen patients had resections with proximal ileostomy and distal mucous fistula. Fifteen patients had end colostomy and 5 patients had a proximal colostomy with distal mucous fistula (**Table – 5**).

Thirteen patients died in the postoperative period. Seven due to MODS, three due to ARDS and three due to sepsis. Most of the morbidity and mortality was seen in the miscellaneous, mainly due to the presence of SMA thrombosis in that group. Morbidity was also high in the trauma group which is explained by the presence of other associated injuries but mortality was seen in only one patient (**Table – 6**).

Discussion

Small bowel or colon may be used for this purpose. The name of the procedure reflects the segment of intestine used. For example, using colon creates a “colostomy,” and using ileum creates an “ileostomy.” Further, if the bowel is completely transected and a single portion of the intestine is brought out of the abdomen, it is termed an “end” colostomy or end ileostomy [11]. However, an intact loop of intestine can also be used. The bowel, in this case, is opened along its anti-mesenteric side while preserving the remaining bowel wall, and both proximal and distal portions of the intestine are secured to the skin creating a “loop” ileostomy or colostomy. Age of 75 patients ranged from 18-60 years [12]. The patients were nearly equally distributed among all the age groups with slightly more preponderance in people over 40 years of age. The

male to female ratio was ~2: 1. So, it can be assumed that males are the predominantly involved group. On analyzing the comorbid factors, as expected, Diabetes Mellitus was the predominant comorbid factor, seen in 9 patients (13.3%), with systemic hypertension seen in three patients (5%) [13]. Other factors like CKD, CAD etc. was seen in another eight patients. On the evaluation of patients, eight patients presented with acute intestinal obstruction while sixteen people presented with trauma either blunt or penetrating [14]. Small bowel perforation was the predominant reason for performing stomas in this study with more than thirty percent of the patients undergoing stomas for the same [15]. Obstructed hernia, Sigmoid Volvulus, Carcinoma Colon and SMA thrombosis with bowel gangrene being the other common indications for stomas in our study. An analysis of the vital parameters, when the patient presented to the emergency department, showed that as expected more than 60% of patients had tachycardia while nearly forty patients had systemic hypotension [16]. Elevated total count indicative of peritonitis was seen in twenty-seven patients (36%) while evidence of pre-renal failure, indicated by elevated urea levels was seen in more than 40% of patients. Around twenty percent of the patients had electrolyte abnormalities [17]. Proceeding to intraoperative findings, thirty-three patients had features of intestinal obstruction, due to either strictures, malignancy, volvulus or bowel adhesions [18]. Forty patients presented with perforation. There were multiple perforations in nine patients. Small bowel involvement was seen in forty-four patients while large bowel was involved in thirty-one patients [19]. With regards to the lag period between onset of symptoms and time of surgery, twenty-nine percent of the patients had surgery within 24 hours, while twenty-eight percent of patients were operated within 48 hours and fifteen percent were operated [20].

Conclusion

Abdomen injuries due to blunt and penetrating trauma and acute bowel pathologies leading to peritonitis such as bowel perforations are the leading causes needing stoma. More the lag period from the onset of symptoms/trauma to the theatre more is the incidence of stoma as anastomotic leakage is more common in this group. Postoperative patient education and counseling are of utmost importance as there is no hope for prior sensitization in emergency settings. Adequate hydration, electrolyte correction, nutrition management, and psychological support teams play a crucial role in bringing a significant number of patients for reversal.

Acknowledgments

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