

Original Article**Clinical profile of patients with intestinal stoma and exteriorization of bowel anastomosis**Sameer G Parikh¹, Prashant N Mukadam¹, Vinod S Kansara¹¹Department of General Surgery, Smt. S.C.L. Municipal General Hospital-Saraspur&Smt. NHL Municipal Medical College, Ellisbridge, Ahmedabad, Gujarat, India

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ABSTRACT**Background:** The age-old life saving procedures of intestinal stoma and exteriorization requires continuous scrutiny in the term of indications, success and failure to give benefit to patient.**Aim:** To assess relevance and validity of this technique in present era of advanced surgical techniques.**Methodology:** The study is carried out on indoor patients of a municipal general hospital of Ahmedabad. 25 patients were observed and data were collected in the prescribed proforma consisting details of patient's history, clinical findings, pathological/radiological investigations, conservative management techniques, operative findings, post operative course & complications, and outcome.**Results:** Observation and analysis of the data of present series was interesting and important aspects were compared with standard series commonest indication was severe intra-abdominal sepsis and commonest site was right iliac fossa. Morbidity was significantly high as compared to other abdominal procedures.**Conclusion:** Even in the modern era, intestinal stoma and exteriorization remains an important tool of saving life of the patients from the lethal disease which they had. The success rate of the procedure to achieve its goal –that is to save life of patient, is 88%.**Key Words:** Intestinal stoma, Exteriorization**INTRODUCTION**

Intestinal stoma has helped human being by making them survive from grave-lethal disorders & helping them to live disease-free life. It has significantly tested surgeon's skill & endurance in giving post operative care also. Surgeon requires highest qualities of communication skill to organize counseling and making stoma effectively functioning with proper stoma care. Then only the goal of successful treatment and satisfactory management is achieved.

The research and hospital setup of the study is located in area where lower socio economic class of population lives. Poor public hygiene, passing stool on open space, non availability of toilets & urinals, poor sanitation, lack of clean potable water, mixing of drainage flow to water pipes, specially due to rain water seepage increase abdominal infections. Frequent habit of consuming alcohol and tobacco adds poor immunity for severe abdominal infections in the form of bacterial – Myco or non-mycobacterial peritonitis, amoebiasis & helminthiasis & bowel malignancy, which in turn leads to major surgical

intervention forcing the surgeon to utilize stoma or exteriorization as life saving procedure.

It is significant, in present era also-to study indications, preoperative predictors of the patients outcome, operative techniques & post operative course - to elaborate conclusions- regarding utility and justification of the techniques. This is a humble effort on our side, in a fast changing field of creation and management of intestinal stoma.

Stoma means [1] an opening of the intestinal or urinary tract onto the abdominal wall, constructed surgically or appearing inadvertently. A colostomy is connection of the colon to the skin of the abdominal wall. An ileostomy is an opening constructed between the small intestine and the abdominal wall, usually by using distal ileum, but sometimes more proximal small intestine. Exteriorization of bowel anastomosis means – Anastomotic segment of the bowel is brought to the exterior part of anterior abdominal wall, when healing of the anastomosis is in the jeopardy. And surgeon wants to prevent collection of the leaked fluid in the peritoneal cavity, done usually from the same incision.

Stomas are classified into different types:[1]

Type by anatomic location: (a) Ileostomy (b) Colostomy

Type by function: (a) Decompressing – is most often constructed for distal obstructing lesions causing dilation of proximal bowel. (b) Diverting – is constructed to provide diversion of intestinal content

Type by Duration: (a) Temporary (b) Permanent

Different Location of stoma on anterior abdominal wall are: (a) right iliac fossa (b) right hypochondriac (c) left iliac fossa (d) left hypochondriac (e) midline-epigastrium

Stoma was introduced in surgical practice more than 200 years ago as a simple and safe procedure [2].

Aims of the study are,

Intestinal stoma is an infrequent but not rare companion of the surgeon who performs gastrointestinal surgery. The aims of the study are to analyze the data obtained from patients who has undergone intestinal stoma / exteriorization in form of (1) study of basic etiology, (2) study of indications leading to stoma/exteriorization, (3) to study different sites of intestinal stoma & its impact on complication, (4) to assess nutritional aspect in patients of stoma and its influence on outcome, and (5) to learn about overall progress of the patient.

The study and conclusions are important in the sense of assessing various aspects of this age-old procedure in context of present time.

METHODOLOGY

25 patients of intestinal stoma/bowel exteriorization admitted in one of the municipal general hospitals of Ahmedabad city, India, were studied during period of two years, i.e. from April 2014 to March 2016. All cases were studied according to general proforma which included clinical details about symptoms, signs, laboratory & radiological investigations, surgery details, complications, postoperative observation & follow up to stoma closure procedure.

All the patients received - standard care for preoperative anaesthesia risk assessment [3], necessary systemic antibiotics[3], preoperative bowel preparation[4] and haemodynamic and nutritional support.

Adequate counseling and training of the patients for the stoma care[5] is essential in the preoperative duration. Resident doctors who remain in the ward and have good rapport with the patients are the best

person to do this. Emergency situations restrict these efforts.

Principles of Exteriorization of bowel anastomosis

During laparotomy, the disease involving segment of bowel was resected. Then, the decision was taken to continue the procedure either by anastomose the bowel ends and keep anastomosis in situ and closed the abdomen, or to perform stoma, or the two ends of the bowel were anastomosed and brought out via a midline main wound with expectation of healing. The exteriorized segment was immediately covered with a saline dressing. Bowel anastomosis [6] is usually done in two layers, an inner layer of haemostatic -full thickness continuous sutures, and outer layer of interrupted seromuscular sutures. In our series the patients in whom exteriorization was attempted-large bowel anastomosis was done using single layer -full thickness continuous haemostatic technique.

Principles of stoma creation: A circular disk is excised of the diameter 2 cm, which allowed two fingers to pass through, in anterior abdominal wall & well vascularised, tension free segment of bowel was delivered through the rectus abdominis. Bowel was opened & secured to skin with evenly spaced non-absorbable sutures [7].

Creation of ileostomy: Elevated the ileostoma opening 2-3 cm from skin to ensure the effluent passes directly into a stoma bag with minimal contact with skin and ileum is everted on itself to form a spout. Ileostomy effluent is liquid, frequently at alkaline pH, excoriates & digests skin [8].

Creation of colostomy: Colostomies were sutured flush with skin and allowed to pout slightly to prevent retraction after weight gain. Colostomy effluent is -formed faeces, discharged intermittently, not directly corrosive to skin and usually falls directly into stoma bag[8].

Stoma appliances: Pouching systems usually consist of a collection pouch plastic bag, known as a one- piece system or, in some instances involves a mounting plate, commonly called a flange, wafer or a base plate, and a collection pouch that is attached mechanically or with an adhesive in an airtight seal, known as a two-piece system [9].

RESULTS

In current study, majority of the patients (36%) were belonged to age group of 36-50 years, followed by

28% in 51-65 years, 24% in 21-35 years while 8% were more than 66 years and 4% were less than 20 years of age. 72% patients were male whereas female patients were 28%. The ratio of male to female is almost 7:3. It is comparable to study conducted at Bhopal-M.P, India [10].

Table 1: Basic etiological factors among study participants

Etiological factors	Frequency	Percentage
Infective- peritonitis	11	44
Malignancy	5	20
Iatrogenic-surgical trauma	3	12
Intestinal obstruction	3	12
Abdominal trauma	2	8
Others	1	4

Infective peritonitis – due to Bowel perforation was the commonest cause (44%) which leads to intestinal stoma.

In our study only 5 patients were admitted with malignancy, as malignancy patients are usually referred to specialized institute. 3 patients were admitted with intestinal obstruction and conservative treatment given to them---but not responded to it and we had to go for operative exploration. Another 3 patients having surgical trauma – surgery for ectopic pregnancy, dilation & curettage and incisional hernia had lead us to stoma formation. 1 patient having mesenteric vascular ischemia –gangrene of small bowel loops was present, which require urgent exploration and stoma formation.

16 patients (64%) were operated on emergency basis & 9 patients (36%) were operated on elective-planned basis.

Stoma: The commonest site of stoma in our study was ileum (48%). Next common sites were transverse colon (32%), jejunum, descending colon, ascending colon, sigmoid, caecum.

Table 2: Site of stoma on anterior abdominal wall

Stoma / exteriorization site	Frequency
Right iliac fossa	10(40)
Right hypochondriac	4(16)
Left hypochondriac	4(16)
Left iliac fossa	4(16)
Midline –main wound	3(12)

Figures in the parenthesis shows percentages

Ileostomy was done in 10 patients, colostomy done in 14 patients and both ileo-colostomy done in 1 patient.

Out of 10 ileostomy patients, 8 patients (80%) were having age below 40 years. Of the 14 colostomy patients, 11 patients (78.57%) were having age above 40 years, and 1 patient having ileo-colostomy, the age was 17 years.

Table3: Age group of stoma patients

Age group (in years)	Procedure		
	Ileostomy	Colostomy	Both
< 20	-	-	1
21-35	3	3	-
36-50	4	5	-
51-65	2	5	-
66-80	1	1	-
TOTAL	10	14	1

The United ostomy association (UOA) from U.S.A and Canada review that the peak incidence for ileostomy construction was seen in persons 20 -40 years of age owing to ulcerative colitis, and incidence for colostomy construction was seen in patients 60-80 years of age because of colorectal cancer[1]. Most common type of stoma made was loop colostomy(24%), double barrel ileostomy (24%), double barrel colostomy(20%), loop ileostomy (16%), Hartman-end colostomy(12%), and double barrel ileo-colostomy(4%).

Stoma output: Ileostomy patients have initially output average 1.3-1.5 liters per day of liquid effluent, but after 7-10 days it was reduced between 500 ml and 800 ml of thick liquid content because of adaption. And Colostomy patients have output average 400-500ml per day of thick semisolid to solid content [11].

Table4: Frequent complications

Complications	No of pts. (%)
Fluid & electrolyte imbalance	10(40)
Skin excoriation-maceration	4 (16)
Shock- septicemia	3 (12)
Psychological	3 (12)
Laparotomy wound infection	3 (12)
Leakage from exteriorized site	2 (8)
Peritonitis leading re-exploration	1 (4)
Retraction of stoma	1 (4)

Figures in the parenthesis shows percentages

In our study, 10 patients had associated medical disorders that have affected the outcome, duration of stoma closure and lead to fluid electrolyte imbalance, nutritional impairment and they influence the management protocol as total gut irrigation and

aggressive total parental nutrition cannot be given to these patients.

Preoperatively all the patients in this study were given treatment of i.v fluid ,injected antibiotics ,Ryle's tube, urinary catheterization, and postoperatively blood transfusion, lipid emulsion, amino acid infusion, inj. of multivitamins and enteral nutrition by oral support .

Post operative follow up laboratory & radiological investigations done - in form of blood investigations, Chest X ray, and USG abdomen to rule out post operative septicemia, post operative intra abdominal& pulmonary complications.

Present study showed that out of 25 patients, 3patients were expired (12%). Of which, 2 pts had pre-operative malignancy & 1 patient was infective with Koch & alcoholic liver disease with malnutrition. One patient died due to septicemia and rests two were died due to post operative hypotension – leading to cardiac and respiratory failure. One patient shifted to higher centre in gastro-surgical department.

Stoma closure: In delayed postoperative course, stoma closure was performed in total 20 patients. Earliest stoma closure was done on 15th postoperative day (patient of mesenteric vascular ischemia). In 14 patients stoma closure was done between 3 months- 6 months. In 3 patients stoma closure was done between 6 months- 9 months and in 2 patients stoma closure was done very late after 9 months. Whereas, remaining 5 patients in which stoma closure was not done - 3 patients died in early post operative period, 1 patient with colostomy was shifted to higher centre for advance treatment of complications and 1 patient remained with permanent end colostomy as he had distal bowel malignancy.

DISCUSSION

Indications vary from emergency procedures performed for abdominal trauma, intestinal perforation, or operative misadventure, to elective-permanent stoma creation as part of radical cancer surgery. Although, ostomy creation is frequently meant to be temporary, up to 40 to 60% will never be reversed. Many stomas are created to improve quality of life; however, complications related to the stoma often have a significant reduction in quality of life and lead to social isolation [12].

In this study of 25 patients, the commonest age of presentation for intestinal stoma formation was 36-50 years. This may be due to the common occurrence of infectious diseases at this age.

The study showed that there were higher chances of stoma formation when there was an emergency surgery due to perforation surgical trauma. This in turn may be due to late presentation of the patients wide intra-peritoneal soiling, unprepared bowel, and uncontrolled associated medical condition.

Infective –peritonitis (44%)-enteric perforation was the most common cause for stoma formation in our study. It is comparable to study conducted at Bhopal-M.P, India [10]. Most of the patient had fever for which they have taken random and inadequate treatment from unregistered practitioners and the treatment was not curative. These patients had edematous and inflamed bowel wall which would not heal, if only perforation is closed without stoma.

In affluent western countries like U.S.A and Canada, indication of ileostomy was complicated ulcerative colitis and indication of colostomy was carcinoma of rectum. This may be due to differential preponderance of these disorders based on different socioeconomic, environmental and genetic factors [1].

To save patient's life from this dreaded condition, surgeon is forced to utilize intestinal stoma or exteriorization of bowel anastomosis .

Exteriorized bowel anastomosis is a procedure which avoids the inconvenience of stoma but it has added burden of layered anastomosis to heal and perform the procedure accurately. Moreover it consumes more operative time as compare to stoma procedure alone [13].



Figure 1: Exteriorized colonic anastomosis

Complications like ischemia and leak from the exteriorized anastomosis limits its benefits to the minimum, making it cumbersome and unfriendly to the surgeon.

Exteriorization is preferred selectively for the patients in which factors which impair healing are not commanding. Exteriorization of the resected

segment is safer procedure as compared to anastomosis with closed abdomen as it allows daily visualization, early appreciation of ischemia, and leak from anastomotic site. A surgeon likes to choose Exteriorization - where stoma is socially unacceptable or the facilities and care is not easily available. In many cultures, stoma is not socially acceptable and is strongly rejected by patient and that makes elicitation of the consent for stoma very difficult. In most of the developing countries, patients cannot afford the expense of the stoma bags for long time. Consultations from the stoma-care person are also costly. In such circumstances, procedures which would spare patients from the inconvenience of stoma would be most valuable.

Commonest site of intestinal stoma is right iliac fossa (40%). This was due to high rate of enteric fever and Koch's abdomen (intestinal obstruction) in our study, which are the diseases affecting bowel usually lying in right iliac fossa.

8% patients had ileostomy positioned in left iliac fossa, the reason to select this site is to prevent sutured bowel from loading of content and to give rest to the diseased bowel.

Each type of stoma is associated with a particular spectrum of complications. But nowadays certain changes at the time of stoma creation which reduces the complications rate & improved the quality of life of the patient. Specialized surgical techniques, development and availability of improved stoma equipment, specialized nursing techniques both preoperatively & postoperatively have enhanced the care of the patient with a stoma.

The complications associated with stoma are studied in form of local and general-systemic.

(A) Local: Skin excoriation-maceration, leakage from exteriorized site, stoma Ischemia, retraction, stenosis, Prolapse, Parastomal hernia, obstruction of small bowel,

(B) Systemic: fluid & electrolyte imbalance, shock- haemorrhagic & dehydration, septicemia-hypoproteinemia, Psychological

Skin maceration, peristomal skin irritation [10] developed in 4 patients [16%] in whom ileostomy had done. None of the colostomy patient presented with this complications. Patients of ileostomy face this complication due to increase fluidity of the effluent which in turn leads to spillage and presence of bile salts, bile pigments and digestive enzymes in it. Effective stoma bag application by a specially trained person as early as possible in the post operative period prevents this complications.

Laparotomy wound infection occurred in 3 patients (12%). All three patients required re-exploration and refashioning of wound & subsequently healed.

Higher rate of wound infection is manifestation of higher contamination of the wound during surgery. Proper wound irrigation during surgery, non-closure of skin of the wound and leaving it open [14], application of vacuum assisted dressing[15] are the solutions of this important cause of morbidity.



Figure 2: Vacuum Assisted Dressing on open abdominal wound with sigmoid colostomy

Leakage from exteriorized colonic anastomotic site through midline wound occurred in both patients and required refashioning and conversion into colostomy. It is the result of chance taking by a surgeon to help a patient by preventing the stoma. Diseased, fibrosed, inflamed, ischemic or adherent bowel makes this exercise futile. Usually stoma and exteriorization prevents the patients from septicemia and its consequences by allowing fecal content of bowel to the external surface of abdomen. But if this fails then patient usually faces mortality. Death rate of 12% is directly related with the septicemia not prevented by stoma or exteriorization.

Several factors affect the type and frequency of complications including surgical specialty and experience of the surgeon, emergency versus elective creation, preoperative marking of stoma site by a dedicated enterostomal nurse, and patient issues such as patient age, obesity, diabetes, and ability to care for the stoma.

Surgeon should be prepared to face all types of complications in the patients. Low level of nutrition, highly infective disorders, late and inadequate previous treatment, unfavorable local conditions, and uncontrolled alterations in serum electrolytes – leads to highest number of complications in the series. Dietary advice to ostomates: It is mandatory to give advice to the patient in the form of -to take low fibre food to reduce bulk in stool & help prevent intestinal obstruction. Patient should avoid vegetables known to results in offensive odour-; garlic, onion, cabbage, cucumber. Patients are asked to avoid-; peas, carrot, chewing gum,

beverages, smoking so that amount of flatus is reduced & patients are also asked to chew food well, increase amount of water intake, consume small quantities of meal at frequent intervals[16].

Considering the life style it was observed that majority of the patients were able to perform personal day to day activities at the time of discharge that is approx. 2 weeks postoperatively [17]. The success of colostomy and ileostomy lies with rehabilitation program in respect to resume the ability to perform household, vocational, social, and sexual activities. These are the new fields of study and care, which requires further advanced evaluation.

CONCLUSION

Even-though the modernization of techniques of surgery, innovations in suture material, antibiotics-giving rest to bowel in patients with severe peritonitis by the way of intestinal stoma is the surest method of helping the patients to survive, & reducing the mortality & morbidity. This is a study of traditional surgical principles and modern surgical techniques compiling surgical science in the benefit of the dying patient, establishing stoma surgery as a life saving procedure. The study showed that septicemia, malnutrition & fluid electrolyte imbalance were major causes of morbidity and mortality. These were because of their attachment to the basic diseases and not related to the stoma or exteriorization procedure. Higher rate of complications are acceptable in the view of ability of stoma to save lives of the patient.

DISCLOSURE STATEMENT

We the authors of this article certify that there are neither any conflicts of interest nor any funding from other organization involved in this study. We the authors completely assure and assign the copyrights of the articles to the journal in case of its publication.

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