

Ileostomy complications: A broad analysis

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Abstract:

Introduction: Construction of a gastrointestinal stoma is a frequently performed surgical procedure. The rationale for a temporary loop ileostomy is to provide de-functioning in case of a potentially dangerous anastomotic complication with an obvious risk for mortality. Although formation of de-functioning loop Ileostomy is usually a straight forward procedure, there is an appreciable complication rate. Most of the complications seen after ileostomy are due to advanced pathology and relative in-experience of the residents in emergency situation.

Objectives: The main objectives of the study were to see the nature and rate of complications of ileostomy construction and to develop a strategy to prevent these complications and how to deal with them.

Main outcome measures: Morbidity and mortality of patients within 03 months of the procedure or till the reversal of ileostomy was performed.

Study design: It was a descriptive Study.

Setting: Surgical B ward, Khyber Teaching Hospital, Peshawar.

Subjects: 106 patients who underwent general surgical operations with construction of an ileostomy were included in the study.

Material & Methods: 106 patients selected by consecutive sampling were included in the study. The study was conducted from August 2016-July 2017 which included 106 patients and data was collected from the Surgical "B" unit of Khyber Teaching Hospital, Peshawar.

Results: The results obtained showed that the most common complication was high stoma output (28.30%), skin excoriation (25.48%). Other complications included stoma prolapse, stoma retraction, parastomal hernia, bleeding, parastomal fistula, electrolytes imbalance, stenosis, and parastomalverices.

Conclusion: It is concluded that Ileostomy should be properly fashioned in order to decrease the morbidity and mortality by properly trained surgeons.

Keywords: Gastrointestinal perforation, Ileostomy, stoma complications, typhoid, tuberculosis, stoma prolapse, stoma retraction, parastomal hernia

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Introduction:

Intestinal stoma or faecal diversion can be defined as the surgical creation of an opening between the bowel (small or large) and the surface of the abdominal wall.¹ The earliest stoma formation recorded was in the 13th century by Saliceto in Italy. In 1793, C. Duret a French surgeon formed colostomy for an imperforate anus in a three days old child. However, development of stoma on a regular basis did not occur till late

20th century when remarkable and ingenious improvement in the surgical creation of stoma was achieved.

Intestinal stomas are associated with a number of complications. In 1952 B. Brooke an English physician solved most of the complications of illeal stoma by creating an illeal spout that was everted upon itself and matured by immediate mucocutaneous suturing and by this opened a

new era in stoma construction.^{2,3} R.B. Turnbull of USA proposed deliberate stoma alone as a new discipline in 1961.^{4,5}



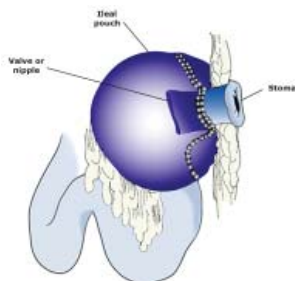
Photo D
End Stoma

End ileostomy (Brooke ileostomy): For many years, the standard management for patients requiring panproctocolectomy for inflammatory bowel disease or familial adenomatous polyposis was creation of an end ileostomy using Brooke's technique (i.e., eversion of the bowel to expose the mucosa followed by mucocutaneous suturing to create an end stoma).



Loop Ileostomy: Loop ileostomy is frequently used to provide temporary faecal diversion following sphincter-saving ileoanal pouch procedures for patients with ulcerative colitis or familial polyposis.

Continent ileal reservoir: The continent illeal reservoir, originally performed by Nils Kock, involves creation of an internal reservoir fashioned from detubularized ileum and rendered continent by intussuscepting the segment of ileum connecting the reservoir to the abdominal stoma.⁶



The ileal pouch is formed from a loop of ileum, folded on itself as a U, and sutured along with antimesenteric borders. The limbs are then incised, exposing the mucosa, and the nipple valve is fashioned. The pouch is closed and positioned as shown underneath the abdominal wall. Note that the stoma is flush with the skin.⁷

Complications: Complications related to ileostomy stoma may occur early or late, intermittently or progressively and may be acute or chronic in nature.

The most common complication is peri-stomal skin breakdown; other common complications include parastomal hernia formation, stomal stenosis, retraction, bleeding, and prolapse.⁹

Parastomal skin breakdown: Parastomal skin irritation most commonly occurs as a result of mechanical trauma, exposure to damaging effluent, or an allergic reaction to a pouching product. Other potential problems include peristomal fungal infections and peristomal pyoderma gangrenosum, an uncommon ulcerative condition that is sometimes seen in patients with inflammatory bowel disease.

Mechanical trauma: Mechanical trauma typically presents as patchy areas of irritated, denuded skin, which results from repeated removal of adhesive products or overly aggressive cleansing techniques.

Parastomal hernia formation: Parastomal hernia formation is a fairly common complication, especially among colostomy patients. To date, the etiologic factors remain obscure.⁸

Stomal stenosis: Stomal stenosis refers to a narrowing of the stoma sufficient to interfere with normal function. Stenosis can occur at the skin or the fascia level.

Stomal retraction: Stomal retraction can occur immediately post-operatively when abdominal obesity precludes a tension-free anastomosis between the stoma and the skin, early postoperatively as a result of mucocutaneous separation, or late postoperatively as a result of weight

Table-1: Age-wise distribution of patients (106)

Age in years	Total patients	%age
15-24	10	9.44
25-34	39	36.80
35-44	31	29.25
45-54	17	16
55-64	9	8.50
Total	106	100

Mean: 33.5 years, Median: 32.83 years, Standard deviation: 10.20 years

Table-2: Complications of Ileostomy

Complications	Number	%
Stoma Prolapse	3	2.83
Stoma Retraction	5	4.71
Parastomal hernia	5	4.71
Parastomal Fistula	2	1.89
Electrolyte imbalance	12	11.33
Skin excoriation	27	25.48
High Stoma Output	30	28.30
Stenosis	2	1.89
Heamorrhage	2	1.89
Parastomal Verises	1	0.95
Death	2	1.89



gain.¹⁰

Significant stomal bleeding: Minor bleeding can occur with overly vigorous stomal cleansing. Major bleeding from the stoma itself (as opposed to a gastrointestinal bleed) is uncommon.

Peristomal varices: Peristomal varices are most frequently seen in patients who underwent colectomy for ulcerative colitis in the setting of primary sclerosing cholangitis.¹¹

Stomal prolapse: Stomal prolapse can occur in patients with elevated intra-abdominal pressure, especially if there was inadequate fixation of the bowel to the internal abdominal wall.¹²

Material and Methods:

Setting: This study was carried out in Surgical D unit of Khyber Teaching Hospital of Peshawar.

Duration of study: One year (from 01- 07- 2016 to 30- 6- 2017).

Sample size: 106 cases.

Sample techniques: Convenience i.e. 106 consecutive cases were selected for the study.

Study design: Descriptive study.

Sample selection: All patients were assessed for sample collection according to the following criteria.

Inclusion criteria: All patients who underwent temporary loop ileostomy, both sexes, age more than 15 years

Exclusion criteria: All patients with wound infection, post-operative ileus, Proximal bowel obstruction, on total parenteral nutrition.

Data collection procedure: A total of 106 patients were included in the study with random sex and age distribution. All patients with indications for ileostomy were admitted to the surgical unit from emergency and outpatient department who fulfill the admission criteria, after taking informed consent from them and a detailed history, complete physical examination was performed. Pre-operative routine investigations were done on each patient

All patients were followed up at 1 month interval and patients with complications (parastomal hernia formation, stomal stenosis, retraction, parastomal fistula, skin excoriation, bleeding, stomalverices and prolapse) were followed for 3 months or till the ostomy was closed at minimum interval of 4 weeks.

All this information was entered into a proforma specially designed for this purpose and attached at the end of this protocol.

Statistical analysis: All the study variables like age, sex, duration of illness, symptoms and signs,

investigations, perforation-operation interval, operative findings, operative procedures performed, post-operative hospital stay and postoperative morbidity were analyzed for descriptive analysis. Mean, median and standard deviation; where applicable was computed by using SPSS version 11 for interpreting the results/measuring the characteristics of the primary data.

Results:

The study was carried out on a total of 106 patients. The results obtained are given below:

Age wise distribution of patients: The age of the patients ranged between 15 and 64 years. In our study the mean age was 33.5 years; median age was 32.83 years with 10.2 years standard deviation. Most were in the range of 25 and 44 years. 20% were below 25 years, 8% were 45-54 years and 4% were in 55-64-year range (table no. 1).

Sex wise distribution of the patients: Out of 106 patients' 76 (71.52%) patients were males and 30 (28.74%) patients were females figure 1.

Symptoms and signs of the patients: Pain abdomen was present in 50 patients with an average duration of 3 days (1-5 days). Vomiting was present in 27(25.48%) of patients and constipation in 12(11.33%) while 13(26%) patients presented with a complaint of diarrhea. On examination, abdominal tenderness and other signs of peritonitis were present in nearly all the 54 patients with enteric fever and in nearly half of those with tuberculosis and pulse rate more than 90/min (tachycardia) in nearly 94% patients.

Investigations done in patients: In those patients suspected to have typhoid fever Widal's test was found to be of significant titers in 39(36.79%) patients and blood culture was positive in 21(19.82%) patients. 17(16%) patients were having leucopenia while 33(31.13%) patients showed leukocytosis. Hemoglobin was 9-11g/dl in 6 (5.67%), 12-14 g/dl in 21(19.80%) and above 15g/dl in 23(21.69%) patients. Blood urea was raised in 13(12.26%) patients; serum potassium was low in 9(8.49%) patients and hyponatremia in 11(16.2%) patients. Stool

culture was positive for salmonella typhi in 17(16%) patients while peritoneal fluid culture was positive in 13(12.2%) patients. X-ray abdomen (erect and supine) and X-ray chest showed fluid-gas levels and free gas under diaphragm in 43 (40.57%) patients.

Biopsy taken from the ulcer margin showed cells of chronic inflammation in all cases.

Operative findings in the patients with typhoid: On opening the cavity small gut contents were found in almost all cases, while frank pus was present in 19(35.1%) patients. Single perforation was found in 43(79.6%) patients while 7(12.96%) patients more than one perforations. In 23(42.59%) cases perforation size was 5-8mm while it was 9 mm-1.5 cm in 25(46.29%) cases and more than 1.5 cm in 2(3.70%) patients. Perforation/perforations were found to be within 20-40 cm in 7(12.97%) cases, 41-60 cm in 43 (79.62%) cases. All perforations were seen on the antimesenteric border with hyperemic or congested gut wall and Peyer's patches.

Post-operative hospital stay of the patients: 26(24.52%) patients stayed for 7 days, 38(35.84%) patients for 9 days, 27(25.47%) patients for 10 days and 15(14.1%) patients stayed for 11 days in the hospital postoperatively. They improved rapidly and were sent home after a mean stay of 9.18 days in the hospital.

Post-operative morbidity and complications: 5 patients (4.71%) stoma retraction, 5(4.71%) patients had parastomal hernia, electrolytes imbalance was noted in 12(11.3%) of the patients and skin excoriation was present in 27(25.48%) patients. Similarly, high stoma output was present in 30(28.30) patients and 2 patients (1.89%) had stomal stenosis and hemorrhage in 2(1.89%) patients. Only one patient had parastomalverices. All these patients were improved on conservative management except 3 patients (2.82%), two with ileostomy retraction and one with stomal stenosis who underwent surgical intervention during their hospital stay. (table no.2).

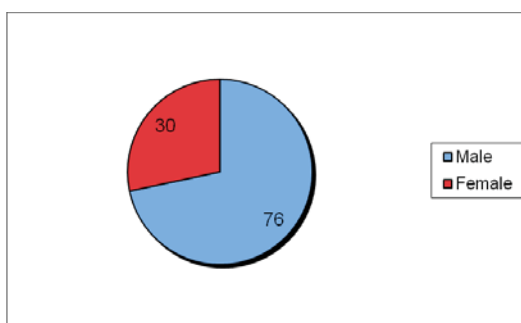


Figure 1: Sex wise distribution of patients (106)

Discussion:

A loop ileostomy is an opening of the intestinal tract into the abdominal wall and is used as a temporary measure for fecal diversion. The first surgical stoma was created 200 years ago.

In cases of delayed presentation, marked sepsis and poor nutritional status preference is given to temporary loop ileostomies over primary closure as it protects against pelvic sepsis & fecal fistula. Tuberculosis, inflammatory bowel disease and anastomotic leak are other common indications requiring loop ileostomy.

Unlike the west, typhoid is still a common cause of ileal perforation in our country.¹³ Complication rate of loop ileostomy ranges from 5-100% probably due to varying length of follow up.¹⁴

In this study, the overall complication rate associated with loop ileostomy was 28.30% (30). Majority of these were treated conservatively with surgical intervention rate of 3.1%. The average length of hospital stay post formation in few patients was prolonged in our study due to concurrent medical problems that required prolonged hospital stay for adequate treatment and poor nutritional status prevailing in poor patients from rural areas that require proper nutritional built-up.

14 (13.20%) of the 106 patients had complications directly related to formation of loop ileostomies. Of the 14 patients 3 patients (2.83%) required surgical intervention. 3 patients (2.83%) had stomal prolapse, 5 (4.73) had stomal retraction, 2 patients (1.89%) had parastomal fistula, 12 (11.33) had electrolytes imbalance, skin excoriation was noted in 27 (25.48%) of patients,

30 (28.30%) of patients had high stoma output failure, stenosis was noted in 2 (1.89%) of the patients, hemorrhage in 2 patients, one patient (0.95%) had parastomalverices and 2 patients died during the course of their illness.

The complication rate of 28.30% is less than reported by other authors, some of whom have reported very high complication rates of 53.6%, 42.9%, 41% and 25% respectively.¹⁵ Other authors have reported similar complication rates as in this study. O' Toole et al. in a series of 102 patients reported a complication rate of 9%. Wexner et al. in a series of 83 patients reported a complication rate of 10.8%. However, Senapati et al. in a series of 310 patients showed a low complication rate of 5.7% associated with loop ileostomy.¹⁶ The surgical intervention rate (3.1%) in this study is less than that reported by Winslet et al and Gooszen et al who have reported 25% and 6% respectively.^{18,19}

However, O' Toole et al and Senapati et al. have a low incidence of surgical intervention rate of 1% and 2% respectively.¹⁷

The usual incidence of peristomal skin problem is 10-14% and probable cause may be improper location, construction of the stoma and post-operative care or maintenance.

This can be prevented using closely fitted appliances around the stoma, with the help of Karaya gum, stomahesive or other pastes.^{20,21}

Stoma prolapse is one of the late complications causes distress, looks alarming unsightly and uncomfortable, diagnosed if the stoma increases in size after maturation requiring change in appliance or surgical intervention. needs great care.²²

Another complication is incisional hernia occurring at the site of intestinal stoma on the abdominal wall. The usual causes are, too large opening in the abdominal wall and stoma site lateral to the rectus muscle. This is diagnosed by digital examination of the stoma.

Our study highlights the low incidence of morbidity that can be achieved with construction of

loop ileostomy. The level of morbidity is acceptable when compared to the subsequent morbidity associated with anastomotic breakdown and primary closure.

Conclusions:

It is of paramount importance that ileostomies are properly sited and constructed. A stoma should be formed by a surgeon, who is not only technically skilled but also understands the potential metabolic and mechanical problems associated with an ileostomy. Although being bothersome, ileostomy is still a life saving procedure.

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Role and contribution of authors:

Dr Iftikhar Mohammad Khan, collected the data, references and did initial writeup

Dr Parkha Rehman, helped in collecting the data and helped in introduction writing

Dr Zainab Rehman, collecting the references and helped in discussion writing

Dr Mahvish Javed, critically review the article and made the necessary changes

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