

## A Clinical Study of Ileostomy Complications

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### Abstract

Our study included 100 patients who underwent surgery for various indications and stoma construction. The aims and objectives of the study are to study the various complications occurred after the construction of ileostomy and to study the ways in which these complications can be minimized and managed in a better way. Stoma education before the procedure will help to prevent complications due to stoma. A preoperative visit with the stoma therapist is essential. A good operative technique and proper site selection avoid complications to the best extent. The complications were better managed with proper preoperative planning with effective stoma care in postoperative period.

**Keywords:** End Ileostomy, Loop Ileostomy, End ileostomy with mucous fistula.

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### Introduction

An ileostomy is an intestinal stoma (from the Greek word for "mouth"), in which the ileum is attached to the abdominal wall surgically. This is done so the digestive waste then exits the body through this opening to which an appliance is attached to collect the intestinal succus. There are essentially two types of ileostomies: end ileostomy (Brooke's ileostomy) and loop ileostomy [1]. Ileostomies are classified temporary stoma or permanent stoma based on the need. After construction of stoma, it produces multiple complications. Most of the stoma complications are minor, can be managed with proper care, but major complications require intervention by means of surgery which produce high morbidity and mortality.

Stoma patients may have malabsorption due to loss of absorptive surface. When an ileostomy is accompanied by resection of the terminal ileum, abnormalities of bile acid reabsorption, malabsorption of vitamin B12, fat malabsorption can occur [6]. Chronic oliguria can occur in ileostomies, because normal stools contain 100 ml of water, whereas ileostomies patients lose 500 to 600 ml of water per day [5]. They have lower urinary Na<sup>+</sup>/K<sup>+</sup> ratios because of compensatory renal conservation.

### Review of Literature

**History of Ileostomy:** Mother Nature was the very first to provide surgeons with the idea of creating a stoma after the observation that fistulas developed spontaneously following bowel perforation. The initial attempts of creating an ileostomy were far from being fruitful, various techniques were tried. From J.M.T Finney's flush-loop ileostomy in 1889 for the treatment of small bowel obstruction in association with an appendiceal abscess, to John Young Brown (1865–1919) creating an ileostomy in the distal segment of a midline laparotomy incision using a catheter sewn in place. None of these techniques resulted in a favorable outcome due to severe skin irritation and mortality rates associated with ileostomy creation were as high as 32% in 1932.

At that time, ileostomies were still considered a procedure of last resort. First recorded Ileostomy in 1879 by Wilhelm Baum, a German Surgeon from Danzig created an ileostomy in a patient with malignant tumor and patient died 9 weeks later. Successful recovery after ileostomy was reported by Maydi from Vienna in 1883. The combination of a protruding stoma and a secure appliance made ileostomy construction a realistic alternative for

patients whose inflammatory bowel disease could not be controlled with medical therapy [2].

Brown reported 10 patients with ileostomy at lower part of incision for laparotomy. After his report ileostomy became used by everyone in 1913. He described Stoma 2-3 inches away from abdominal wall can be emptied without complications [3]. Brooke made very important advancement in ileostomy. In 1952, in his article, he described "Management of Ileostomy and its Complications". He described most important step "evaginate the ileal end at the time of operation and suture the mucosa to the skin; no complications have occurred from this" - Bryan Brooke (1952), [4].

**Operative Technique:** A flat skin surface is preferred. Stoma should be seen by patient when bend, sit, stand. Previous scars, bony prominences, waist, beltline, inguinal crease, should be avoided if possible. A laparotomy incision is 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 either end or loop stomas. The mesentery should be cleared from the terminal 5 to 6 cm of the ileum. The ileal gutter may be closed to prevent small bowel obstruction secondary to small bowel rotating around the ileostomy. Ileal pouting is accomplished by tripartite sutures containing dermis, the seromuscular layer of the bowel at the fascial level, and full thickness bites of the cut edge of the ileum. The loop stoma should protrude adequately, with its functional end occupying approximately 80% of the trephine circumference. The loop of ileum can also be secured to the stoma site with a novel 'suture bridge' technique [7, 8].

#### Complications of Ileostomies and Their Management

**Ischemia:** Necrosis of a stoma is due to impaired blood supply to the stoma mucosa. This usually is evident within 24 hours after surgery. Partial necrosis is more common compared to whole circumference necrosis. The incidence ranges from 2 to 20%. More serious complete or deep necrosis can occur in 0.37 to 3% of cases [9]. It can also occur in people with poor systemic circulation or a thick abdominal wall. Blood supply to the stomal edge should be confirmed before it fixed to abdominal surface.

The stoma needs to be viable above fascia level to prevent peritonitis. Interventions for a necrotic stoma include documenting the mucosa color and assessing the depth of the necrosis. Urgent intervention is needed when there is necrosis of ileostomy.

**Mucocutaneous Separation:** Mucocutaneous separation results when the suture line at the junction of the stoma and skin separates. The incidence ranges from 4.0 to 26 %. This can occur when there is an oversized skin opening of the stoma, excessive tension on the suture line, insufficient suturing at skin level, or inappropriate sutures, or with patients who have compromised tissue healing, which may include those with diabetes, those taking high-dose steroids, those with malnutrition, or those receiving radiation therapy. Stoma necrosis can also cause a mucocutaneous separation as the necrotic tissue detaches from the skin. The separation may be partial or circumferential.

The defect can be irrigated gently and then packed with an absorptive wound dressing if it is more than 1 cm in depth. Absorptive wound dressings, such as a hydro fiber or calcium alginate, would absorb drainage, prevent excessive soiling of the wound by stool, and promote healing of the separation. If the separation is shallow, the base can be filled with a skin barrier powder to absorb moisture. Once the separation is packed, the skin barrier of the pouching system is placed over the stoma to provide protection from the effluent.

**Stenosis:** Stoma stenosis is described as a narrowing of the lumen of the ostomy in the skin or fascia level. The lumen contracts due to scar formation. Stoma stenosis can occur as a result of insufficient skin excision at the stoma site, excessive scarring due to stoma necrosis, peristomal abscess, or mucocutaneous separation. Significant stenosis can affect the normal stoma function, resulting in discomfort when stool passes through the stoma. Digital examination of the stenosed stoma reveals tightness in the skin or fascia opening. Simple dilatation is sufficient for mild stenosis. Moderate to severe degree of stomal stenosis need some kind of surgical intervention.

**Prolapse:** Prolapse is progressive elongation of the ileostomy through the skin opening. The incidence ranges from 2 to 22%. Loop ileostomies has less complications compared to loop colostomies and ranges from less than 2% for loop ileostomy, while loop colostomies ranges from 16 to 19% [10]. Prolapse can occur with each of the following scenarios:

- (a) The ileostomy has not been placed through the rectus muscle of the abdomen,
- (b) Large opening in the abdominal wall at the time of surgery,
- (c) Insufficient suturing to the abdominal wall,
- (d) Weak abdominal musculature,
- (e) Distended bowel or increased intra-abdominal pressure, possibly due to distention or crying in

infants. In severe prolapse, there will be obstruction due to traction on the mesentery. There may also be evidence of tiny ulcerations on the ileostomy mucosa. Stoma ischemia requires immediate surgical attention. A prolapse can be managed conservatively if the stoma color and function remain normal. The prolapse may be manually reduced with the patient lying flat. Continuous pressure is applied to the distal portion of the stoma, or an ice pack applied directly to the stoma to decrease the edema and aid in reducing the stoma. The pouching system should be flexible, with sufficient length to accommodate the prolapsed stoma. The skin opening in the appliance should fit the stoma when it is at its largest diameter, usually with the person standing. Surgery may be necessary to resect the prolapse and revise the stoma.

**Retraction:** Two types of retraction can occur with an ostomy: Stoma retraction or peristomal skin retraction. Stoma retraction incidences ranges from 1.4% to 9% [10]. Retraction is more in ileostomy compared to colostomy. The patient may have a stoma that protrudes 1 to 2 cm or may have a flush stoma, but the skin retracts around the stoma. The retraction may be preceded by stoma necrosis or mucocutaneous separation. Retraction is due to tension on the bowel, obesity, edema, distention, stoma length and short mesentery. The goal for management of stoma retraction is to maintain an adequate appliance seal to prevent effluent from causing skin irritation. This may require the use of a convex appliance, possibly with additional skin barrier rings to increase convexity, depending on the degree of retraction. Surgical intervention may be necessary if problems persist.

**Parastomal Hernia:** Parastomal hernia is a common complication after colostomy formation. Causes of formation of parastomal hernia include Obesity, Increased intra-abdominal pressure, and dilated bowel loops in pre-operative status, Emergency stoma construction. Prevention of parastomal hernia can be done by making an incision which admits only two fingers, use of prosthetic mesh and stoma construction through rectus abdominis muscle. Clinical presentation is most of the times asymptomatic, or may present as bulging near stoma site, difficulty in applying stoma bag, Intestinal obstruction/strangulation or Parastomal evisceration. Management includes stoma relocation, retromuscular dissection, posterior component separation, and retro muscular mesh placement. Complications are highest recurrence rate, increased morbidity, intra-abdominal mesh leads to adhesion and obstruction. Management of parastomal hernia is very difficult. But there is evidence that use of mesh will prevent complications associated with parastomal hernia [11].

**Fistula:** An enterocutaneous fistula is an abnormal communication between the stoma and the surrounding skin. It appears as an opening on the peristomal skin or at the mucocutaneous junction of a matured stoma. Stool may be evident at the fistula site and through the stoma. Fistulas may occur when a suture was placed through the mucosa of the stoma at the time of surgery, but most commonly are due to recurrence of Crohn disease, poor healing, and mechanical trauma from the appliance being used. Although some superficial enterocutaneous fistulas will heal spontaneously, surgical intervention may be needed to resolve the fistula [12]. If surgical intervention is delayed or not indicated due to other medical problems, a pouching system that can accommodate both the stoma and the fistula should be considered. A convex appliance may provide a better seal for the skin.

**Peristomal Skin Complications:** The onset of peristomal skin complications occurred mostly during 3<sup>rd</sup> week to 5<sup>th</sup> week. The most common skin conditions were irritation (Irritant or contact dermatitis) and infection. Peristomal skin complications ranges from 18 to 55% [13]. This may be due to poor stoma construction causing effluent to be in contact with the skin or from poor technique in appliance care. Skin damage correlates with the area that is exposed to the irritant. The skin shows erythema and swelling. It may progress to denudation, ulceration, bleeding, and weeping because of the loss of epidermis. The appropriate pouching system provides a secure, predictable wear time and protects the peristomal skin from effluent. Topical steroids may be used short term to reduce the inflammation and pain. The Skin barrier powder can be applied to the skin to absorb moisture and provide a dry surface.

**Mechanical Injury:** Damage to the peristomal skin may result from mechanical injury, such as trauma, shear, or pressure. Common causes include abrasive cleansing techniques and traumatic tape removal that results in epidermal stripping, shearing of the skin as the appliance moves on the skin, or continued friction or pressure from inappropriately fitting equipment. Mechanical injury can be prevented by educating the patient in appropriate appliance removal, which is gently pushing the skin away from the appliance instead of pulling on the skin. Adhesive removers may be necessary if the skin is thin or sensitive, but it is important to wash the adhesive remover off the skin before applying another appliance to prevent contact dermatitis.

#### Materials and Methods

This is a prospective study conducted on 100 patients admitted under Department of General Surgery, S.C.B. Medical College and Hospital,

Cuttack, Odisha over a period of 2 years i.e. between Nov 2023 to Oct 2025.

**Inclusion Criteria:**

1. All patients male and female between the ages of 10 to 80 years undergoing ileostomy.
2. All elective and emergency cases undergoing ileostomy.

**Exclusion Criteria:**

1. Patients undergoing colostomies.
2. Patients undergoing urinary stoma construction.
3. Patients undergoing stoma construction as an indication for gynaecological disorders.
4. Pregnant and lactating females.

**Statistical Method**

Descriptive analysis has been carried out in the study. Significance was analyzed by using Chi-

square test. The statistical software used was SPSS 22.0 version and Microsoft and Excel used for generate table and graph

**Results & Discussion**

All cases underwent detailed preoperative assessment, indications for stoma construction and post-operative complications were recorded meticulously as per protocol. The findings were analysed and tabulated. Our study included 100 patients who underwent surgery for various indications and stoma construction. The maximum number of patients were in the age group of 36-45(n=23) followed by 26-35(n=19). In this study, 73 were male patients and 27 were female patients. 84 patients underwent stoma construction as an emergency procedure compared to 16 patients who underwent stoma construction as an elective procedure.

**Table 1: Causes for ileostomy**

Primary causes		Secondary causes	
Adhesive intestinal obstruction	17%	Caecal perforation	13%
Hollow viscus perforation	33%	Colonic perforation	9%
Obstructed hernia	9%	Ileal perforation	25%
Abdominal trauma	7%	Meckel's perforation	1%
G.I. malignancy	33%	Intestinal obstruction	44%
Entero-cutaneous fistula	1%	Sigmoid perforation	8%

**Table 2: Comparing most common primary cause for stoma creation across different study**

Different study	Causes	Complication
Akeel M.A. AL-Faham et al	Malignancy (64%), Congenital (15%)	
Syed Asad Ali et al	Enteric fever (81.33%), Tuberculosis (9.43%)	
Akram Rajput et al	Enteric fever (66%), Iatrogenic (10.70%)	Skin excoriation (21.40%), Poor sitting stoma (7.10%)
Ambreen Muneer et al		Skin excoriation (17.64%), Wound infection (5.80%)
Present study		Skin excoriation (45%), Wound infection (9%)

Most of the patients presented with complaints of abdominal pain both in emergency setting as well as elective setting (54%). The 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 5 days (39%). The most common primary indication for stoma construction was Hollow Viscus Perforation (35%) followed by GI Malignancy (17%). The most common secondary causes were intestinal obstruction (44%) followed by ileal perforation either infective or traumatic (25%). The most common type of stoma constructed was loop ileostomy (50%) followed by end ileostomy (37%). The most common complication observed in stoma construction were skin excoriations (45%), followed by laparotomy wound infection (9%). Most of the complications occur within a week,

mostly on 4-7 days (56%). Two patients developed mortality due to stoma related complications.

**Conclusion**

Most of the patient undergoes stoma as an emergency procedure rather than elective procedure. Duration of hospital stay approximately 16-20 days, even prolonged when complications occur. The most common indications for stoma construction were hollow viscus perforation followed by GI Malignancies. The most common type of stoma constructed was loop ileostomy followed by end ileostomy. The most common complication observed in stoma construction were skin excoriations, followed by laparotomy wound infection.

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 or perforation in malignancy and perforation in trauma patients. Most common stoma constructed was loop ileostomy followed by end ileostomy. There is high incidence of peristomal complication related to that. The complications were better managed with proper preoperative planning with effective stoma care in post-operative period.

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