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Intestinal Stomas - Complications, Prevention and Management: Our Experience in Tertiary Hospital

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ABSTRACT

INTRODUCTION: A stoma is defined as an opening into a hollow viscus either natural or surgically created which connects a portion of body cavity to the external environment^[1]. Ileostomy or colostomy creation is a crucial part of numerous surgical procedures carried out for a variety of gastrointestinal problems. Despite the frequent occurrence of intestinal stomas, stoma-related problems are still frequent and are associated with high morbidity and expense.

OBJECTIVE: The objective if this article is to understand these frequent issues, go into depth about how to prevent or avoid them, and provide management advice.

METHOD: Prospective

RESULTS: Peristomal skin complications and parastomal hernia were the most common complications. End colostomy had the highest incidence of morbidity, followed by loop colostomy and loop ileostomy.

CONCLUSIONS: Ileostomy and colostomy forms are frequently done procedures, but sadly they are linked to high morbidity and stoma-related complication rates that range from 21 to 70%. It has been demonstrated that preoperative entero-stomal therapy consultation and stoma site labelling by either an entero-stomal therapist or skilled surgeon lessen postoperative problems. In addition, it is crucial to pay close attention to the technical aspects of stoma production. In order to definitively address concerns concerning the optimal trephine size, the use of prophylactic mesh, and other aspects of stoma creation, additional randomized trials are required. Clinical wound ostomy nurse specialists are extremely helpful following surgery, and the use of standardized protocols has further helped to reduce the frequency of common problems and readmissions for dehydration.

KEYWORDS: Peristomal, Complications, Skin, Hernia, Obstruction

INTRODUCTION:

Stoma is defined as an opening into a hollow viscus either natural or surgically created which connects a portion of body cavity to the external environment^[1]. Ileostomy or colostomy creation is a crucial part of numerous surgical procedures carried out for a variety of gastrointestinal problems. Despite the frequent occurrence of intestinal stomas, stoma-related problems are still frequent and are associated with high morbidity and expense. This article will go through some of the most common stoma formation issues, including ischemia, mucocutaneous separation, laceration or trauma, stenosis, prolapse, retraction, parastomal hernia, peristomal skin complications, obstruction , bleeding, and excessive ostomy output-related dehydration.

Peristomal skin complications and parastomal hernia were the most common complications. End colostomy had the highest incidence of morbidity, followed by loop colostomy and loop ileostomy. This article will discuss these frequent issues, go into depth about how to prevent or avoid them, and provide management advice.

In the management of a number of benign and malignant medical conditions, including to inflammatory bowel disease, gastrointestinal malignancy, gastrointestinal obstruction or perforation including anastomotic leak, trauma, severe perineal wounds requiring diversion, end-stage incontinence, and others, temporary or permanent ileostomy or colostomy creation is used. No matter the type of stoma, with proper construction methods, stoma care, and psychosocial adaptation, ostomies should at the very least limit and frequently improve the patient's quality of life.^[2] Regarding the complication profile and subsequent care techniques, the precise type of stoma and its anatomic location inside the gastrointestinal tract and on the abdominal wall can have an impact. Stoma-related complications can range from minimal, which can be efficiently treated with local entero-stomal therapy, to severe, requiring reoperation and burdening the patient's emotional and physical health as well as the healthcare system.^[3] Stomal problems are estimated to occur anywhere from 21 to 70% of the time. Although there is a lifetime risk of complications, they are most common in the first five years following stoma development.^[1,4,5] In terms of timing, complications can be categorised into three groups: those that happen right away after surgery (early in the postoperative course) and are typically of a technical nature, those that happen within a month of surgery (late in the postoperative course) and are frequently observed in the context of permanent stomas. End ostomies, whether ileostomies or colostomies, generally have lower rates of problems than loop ostomies, with loop colostomies in particular having the highest rates.^[6] Additionally, preoperative stoma site labelling by entero-stomal therapists or skilled surgeons has been demonstrated to lower the incidence of postoperative problems independent of the indication or ostomy type.^[1,7] Suboptimal stoma site position is well acknowledged as a major risk factor for the emergence of several of the most prevalent postoperative stoma-related problems.

Technical Points of Interest:

This emphasises how crucial it is to prepare ahead and pay close attention to technical details while creating a high-quality stoma in order to reduce the likelihood of issues associated to stomas. When possible, selecting a suitable stoma site should be done before surgery. The patient should be evaluated for marking when supine, sitting, and standing in order to detect problems with body habitus. The predicted stoma site should, whenever feasible, be away from skin creases, planned incisions, old incisions, and bony prominences. An adequate appliance seal is aided by a 2-inch flat surrounding area of healthy skin. When possible, stoma sites should be located at the top of a fat mound. Multiple sites should be marked in obese patients, those with complex anatomy (previous scars), and especially when surgical plans are uncertain.^[3] While the construction of a sufficiently long, well-vascularized, tension-free, and widely patent stoma can be simple, the surgeon must be ready for more difficult situations, such as emergency surgery and the obese patient with a thick abdominal wall or foreshortened thickening mesentery.^[8] Although it is outside the scope of this paper to go into great length about the value of preoperative planning, patient education regarding the psychosocial stressors of having an ostomy, and other technical components of the optimal stoma construction, their significance cannot be understated.

ISCHEMIA

Necrosis of a stoma occurs due to impaired blood supply to the stoma mucosa. This is usually evident within 24 hours after surgery. Partial necrosis is more common as compared to the whole circumferential necrosis. The incidence ranges from 2 - 20%. More serious complete or deep necrosis can occur in about 0.37 - 3% of cases.^[9] It can also occur in people with poor systemic circulation or a thick abdominal wall. Preparation of proper bowel segment for stoma construction will prevent necrosis of stoma. Blood supply to the stoma edge should be confirmed before it fixed to abdominal surface. Because of ischemia and necrosis, chronic blood loss is common in a diversion stoma. Colour of stoma will change from purple to grey to black and surface will become dry (Figure 7 (a)). Up to 5cm of mesentery will avoid ischemic necrosis of end ileostomy.^[10] The stoma needs to be viable above fascia level to prevent peritonitis. As the nonviable tissue sloughs from the stoma, this tissue can be debrided.

Interventions for necrotic stoma include documenting the mucosa colour and assessing the depth of the necrosis. Urgent intervention is needed when there is necrosis of ileostomy. But ischemic necrosis of colonic stoma need not be revised if the necrosis is short. *Malik et al.,2018* reported stomal complications as none in loop ileostomy, 2.6% inloop colostomy, and 5.9% in end colostomy.^[11]

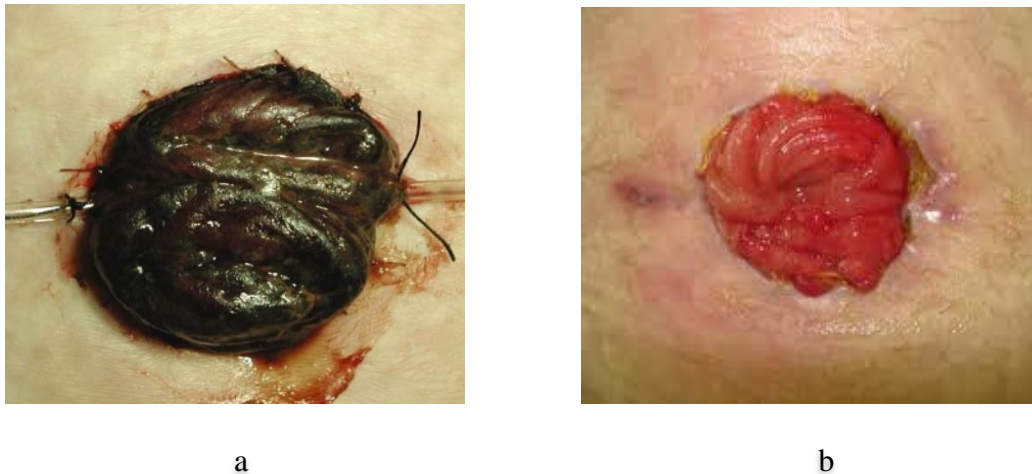


Figure 1: (a) Stoma ischemia ; (b) Muco-cutaneous separation

MUCOCUTANEOUS SEPARATION

Mucocutaneous separation results when suture line at junction of the stoma and skin separates (Figure 1 (b)). The incidence ranges from 4 to 26%.^[12] This can occur when there is oversized skin opening of the stoma, excessive tension on 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. It can also cause mucocutaneous separation as necrotic tissue detaches from skin. Separation of mucocutaneous junction arises due to indurations of mucocutaneous junction. It may be partial or circumferential. There may be discharge present in separation, usually serous or purulent in nature. Stool drainage could indicate possible fistula in separation. It should be probed gently to determine depth and access for tracts that may be present. The defect can be irrigated gently and then packed with absorptive wound dressing if it is more than 1 cm in depth. Absorptive wound dressings, such as a hydro fibre 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 separation is packed, skin barrier of the pouching system is placed over stoma and separation to provide protection from effluent. As separation heals, it may be necessary to modify appliance for improved fit on peristomal area. For prevention of mucocutaneous separation numerous modifications proposed.^[13]

LACERATION (STOMA TRAUMA)

Stoma trauma or laceration is an injury or cut on the stoma mucosa. This can occur when the appliance opening is too small or is improperly placed over the stoma, with shaving or direct injury to the stoma. Bleeding may occur at the site and there may be blood in the pouch. Management requires identification and correction of the cause.

The appliance should be altered to fit the stoma appropriately. If the stoma mucosa is bleeding significantly at the time of appliance change, direct pressure should be applied to the site until bleeding is controlled.^[14]

STENOSIS

Stoma stenosis is described as narrowing of the lumen of ostomy at the level of skin or fascia (Figure 2 (a)). The lumen contracts due to scar formation. Stoma stenosis can occur as result of insufficient skin excision at the stoma site, excessive scarring due to stoma necrosis, peristomal abscess or mucocutaneous separation. Significant stenosis can affect normal stoma function, resulting in discomfort when stool passes through stoma.^[15] *Malik et al* reported an incidence of stomal stenosis in nearly 0.7% cases of loop ileostomy, while a near-equal incidence of 2.5% in loop colostomy and end colostomy.^[12] Digital examination of stenosed stoma reveals tightness in the skin or fascia opening. The patient with stenosed colostomy may note symptoms of constipation and increased cramping with stoma function as well as effluent exiting the stoma under pressure. Management of stomal stenosis varies from degree of stomal stenosis. Simple dilatation is sufficient for mild stenosis, while moderate to severe degrees require some kind of surgical intervention.^[15]

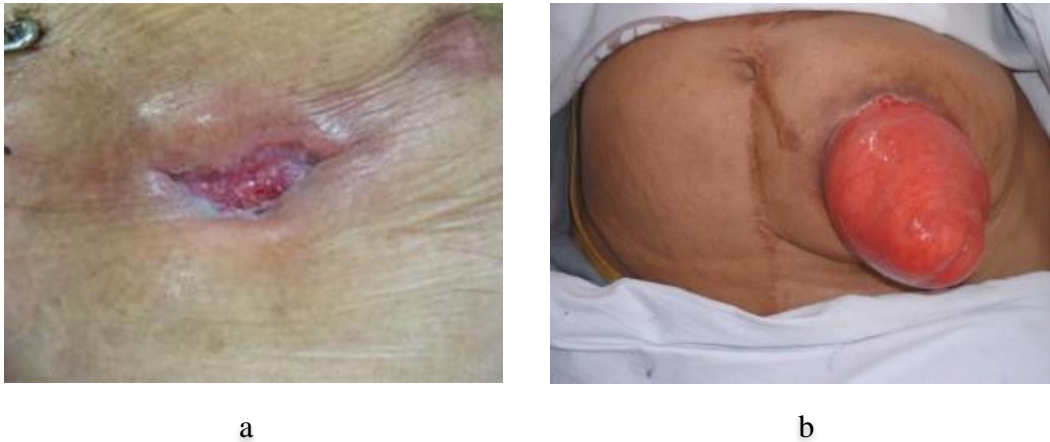


Figure 2: (a) Stoma stenosis; (b) Stoma prolapse

PROLAPSE

Stoma prolapse is progressive elongation of the stoma through the skin opening (Figure 2 (b)). The incidence ranges from 2 to 22% for stomal prolapse, with lesser incidence in loop ileostomies than for loop colostomies. The incidence ranges from less than 2% for loop ileostomies to up to 19% in loop colostomies.^[16] Malik *et al* reporting 0% incidence of prolapse in loop ileostomy, 7.9% in loop colostomy and 4.1% in end colostomy.^[12]

Prolapse can occur within patient with the stoma has not been placed through the rectus muscle of the abdomen, Large opening in the abdominal wall at the time of surgery, Insufficient suturing to the abdominal wall, Weak abdominal musculature, Distended bowel or increased intra-abdominal pressure, possibly due to distention or crying in infants.

Prolapse are seen most commonly in a loop stoma. Although either loop can prolapse, it is seen most often in the distal or non-functioning loop. It varies from increase in length of stoma to severe bleeding from the stoma. In severe stomal prolapse, there will be obstruction due to traction on the mesentery. There may also be evidence of tiny ulcerations on the stoma mucosa. Stoma ischemia requires immediate surgical attention.

Stoma prolapse and peristomal hernias are common in infants. They do not have well-developed abdominal muscles to support the stoma. Increased intra-abdominal pressures can also stretch the fascial opening to create a hernia. A prolapse can be managed conservatively if the stoma colour 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 oedema and aid in reducing the stoma. It is common for the prolapse to recur when the person sits, stands or coughs as the intra-abdominal pressure is increased. 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 prolapse and revise stoma.^[17]

RETRACTION

Two types of retraction can occur with an ostomy: Stoma retraction or peristomal skin retraction. Stoma retraction occurs when the stoma does not protrude above the skin, but has pulled back to skin level or below skin level (Figure 3 (a)). The incidence ranges from 1.4% to 9%. Retraction is more commonly seen in ileostomy compared to colostomy.^[18] *Malik et all* reported an incidence of 3.1% in loop ileostomies, 1.3% in loop colostomies and 4.8% in end colostomies.^[12]

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, oedema, distention, stoma length and short mesentery. Skin retraction occurs when the peristomal skin at the mucocutaneous junction pulls in, especially when the patient is sitting or standing. The stoma should be evaluated with the patient sitting and standing to determine the degree of retraction. Patients will present with problems with appliance leakage, decreased appliance wear time, and skin irritation from stool, contact with skin. 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.^[16]



(a)



(b)

Figure 3: (a)stoma retraction; (b)parastomal hernia

PARASTOMAL HERNIA

It is common complication after colostomy formation. while creating abdominal stoma, we need to create defect in the abdominal wall. Due to creation of defect in the abdominal wall leads to formation of parastomal hernia (Figure 3 (b)).^[17] *Malik et all* reported the incidence of parastomal hernia of 2.4% in loop ileostomy, 0% in loop colostomy, 59.3% in end

colostomy.^[12] Causes of parastomal hernia are Obesity, increased intra-abdominal pressure, dilated bowel loops in pre-operative status, emergency stoma construction. Parastomal herniation prevented by Make an incision which admits only two fingers, Use of prosthetic mesh prevents parastomal hernia. Prophylactic use of mesh will prevent parastomal hernia in patients who undergoes permanent colostomy for colorectal malignancy.^[18] Stoma construction through rectus abdominis muscle.^[19] Clinical presentation of parastomal hernia mostly remains asymptomatic. In some patient it may be presented as bulging near stoma site, Leakage from stoma, difficulty in applying stoma-bag, intestinal obstruction, strangulation of bowel, parastomal evisceration^[20]. Management of parastomal hernia include stoma relocation, retro-muscular dissection, posterior component separation, and retro-muscular mesh placement.^[21] Local repair, use of prosthetic mesh, stoma relocation.^[22]

PERISTOMAL HERNIA

A peristomal hernia is due to defect around the opening of stoma. When stoma becomes larger, it allows the bowel loops through the defect around the stoma, resulting in progressive bulging around the stoma. The bulging is usually more prominent with sitting and standing. It occurs when there is a large fascial defect, an increase in intra-abdominal pressure, placement of stoma through an incision, aging, or excessive weight gain. Digital examination allows the fascial defect to be felt as well. To confirm the presence of a hernia, a computed tomography scan with oral contrast or an upper gastrointestinal radiograph with small bowel or retrograde contrast study can be done. Nonsurgical intervention is usually recommended if the patient is asymptomatic. Hernia support belts or binders will provide support around the stoma, reducing the protrusion of the hernia, and can help with appliance adherence. It is best to use flexible appliance to fit the changing contour around the stoma. The stoma size should be evaluated when the patient is sitting and standing as it will usually become larger when the hernia protrudes.

Surgical intervention may include primary repair, local repair, mesh repair, or relocation of ostomy.^[16] *Shellito* reported incidence of recurrence following local fascial repair without mesh at 76%, local repair with mesh at 50% and stoma relocation at 33%.^[23]

OBSTRUCTION

Causes of the stomal obstruction includes stomal stenosis, parastomal hernia, post operative adhesions , recurrent disease *Malik et all* reported incidence of obstruction in loop ileostomy by 3.8%, loop colostomy 2.9% and end colostomy 4.7%.^[12]

Management depends on the cause.

ENTEROCUTANEOUS 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. 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.^[24] *Malik et al* in their study reported an incidence of enterocutaneous fistula of 0% in loop ileostomy (0–2.7%), 4% in loop colostomy (2.8–5.1%) and 0% in end colostomy.^[12]

PERISTOMAL SKIN COMPLICATIONS

Malik et al reported an overall 14% incidence in the peristomal skin complications, with 32.3% being highest in ileostomies, followed by 3.6% in colostomies.^[12]

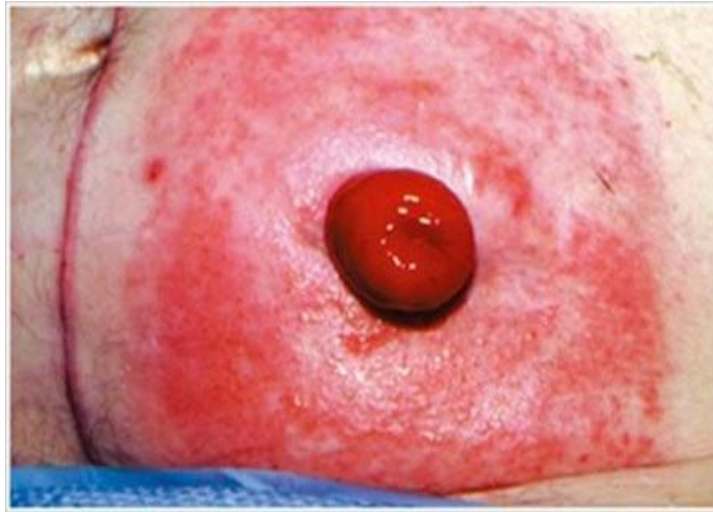


Figure 4: Peristomal skin excoriation

The onset of peristomal skin complications occurred mostly during 3rd week to 5th week. The most common skin conditions were irritation (Irritant or contact dermatitis) and infection.^[25] Irritant dermatitis of the skin results from contact with a chronic irritant, such as stool or chemicals.^[26] Peristomal skin complications ranges from 18 to 55%. This may be due to poor stoma construction causing effluent to be in contact with the skin or from poor technique in appliance care.^[27] Effluent may come in contact with the skin if the appliance is not the appropriate size, has not been applied appropriately, or has been left in place too long. Also, if the stoma is located in poor location or is poorly constructed, this may contribute to leakage and dermatitis. Skin damage correlates with area that is exposed to the irritant. Skin shows erythema and swelling. It may progress to denudation, ulceration, bleeding and weeping because of the loss of epidermis.

Treatment is directed at identifying and eliminating the cause. The goal is to protect damaged skin and avoid other irritants. 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 pouching surface.^[28]

INCISIONAL HERNIA

Incisional hernia can occur after stoma reversal at either the stoma site or at the midline incision. The incidence for stoma site incisional hernias is closer to one in three and for midline incisional hernias is closer to one in two.^[29]

CONCLUSION:

Ileostomy and colostomy forms are frequently done procedures, but sadly they are linked to high morbidity and stoma-related complication rates that range from 21 to 70%. It has been demonstrated that preoperative entero-stomal therapy consultation and stoma site labelling by either an entero-stomal therapist or skilled surgeon lessen postoperative problems. In addition, it is crucial to pay close attention to the technical aspects of stoma production. In order to definitively address concerns concerning the optimal trephine size, the use of prophylactic mesh, and other aspects of stoma creation, additional randomized trials are required. Clinical wound ostomy nurse specialists are extremely helpful following surgery, and the use of standardized protocols has further helped to reduce the frequency of common problems and readmissions for dehydration.

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