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Early and Late Complications of Colostomy: A Mini Review

Mostafa Eissa Mohamed Eissa, AbdElhafez Mohammad Elshewail, Waleed Ahmed Abd EL-Hady Hassan and Yousef Ahmed El-Ayman

General Surgery Department, Faculty of Medicine, Zagazig University, Egypt

***Corresponding author:** Mostafa Eissa Mohamed Eissa

Abstract:

Background: Colostomy is a commonly performed surgical procedure used for fecal diversion in patients with benign or malignant gastrointestinal diseases, particularly in emergency colorectal surgery. Although colostomy formation may be considered technically straightforward procedure, it can be associated with several early and late complications that significantly affect patient recovery, stoma care, and quality of life. Early complications include inappropriate stoma siting, peristomal dermatitis, parastomal ulceration, stoma necrosis, and stoma retraction, while late complications include stomal prolapse, stomal stenosis, peristomal pyoderma gangrenosum, and parastomal hernia. These complications may result from patient-related factors such as obesity, poor nutritional status, inflammatory bowel disease, steroid therapy, wound sepsis, and increased intra-abdominal pressure, as well as technical factors related to stoma construction, bowel tension, and trephine size. Proper preoperative stoma site marking, careful surgical technique, adequate bowel mobilization, and postoperative stoma care are essential to reduce morbidity and improve patient outcomes. This review highlights the major complications of colostomy, their risk factors, prevention, and management.

Keywords: Colostomy; Stoma complications; Peristomal dermatitis; Stoma necrosis; Stoma retraction; Stomal prolapse; Parastomal hernia.

Introduction:

Colostomy is one of the most common surgical procedures adopted by surgeons worldwide. It is considered a part of life saving treatment for benign and malignant gastrointestinal conditions on an emergency basis [(1)].

It is an old procedure involving diversion part of the colon outside the peritoneal cavity through an opening in the abdominal wall. It was introduced in surgical practice more than 200 years ago [(2)].

Although its formation is considered an easy procedure, consequences can be complex and life-threatening [(3)].

The procedure is usually performed at the end of a long and complex surgical operation. There can be a tendency to leave it to a junior member of the team, but, when performed badly, it can leave the patients with a legacy of complications [(4)]. Apart from the nuisance associated with these complications, they can also make it more difficult for patients to manage their stomas independently, and demands may then have to be made of their relatives or district nurse services.

The complications recorded are generally classified as early and late complications and the stoma closure itself is associated with significant morbidity [(5)].

Early complications

Inappropriate site

Colostomy is always associated with decrease quality of life. And in order to minimize the consequences of any stoma formation and its effect on the quality of life of the patient, it is important to select the optimal site for the formation of that stoma [(6)].

In cases of elective colorectal surgeries which need stoma formation, this is best done preoperatively by a specialist stoma therapist [(7)]. It is important that the position of the stoma is marked with the patient standing, bending and sitting, to ascertain that the stoma is not in a skin crease and that it is visible to the patient in all positions. An inappropriate site is associated with many complications like leakage, skin irritation and skin breakdown around the stoma [(4)].

In emergency surgery, the appropriate place for the stoma should be marked before making the incision, but, failing this, the best guide for locating the stoma in emergency is two-thirds of the way along an imaginary line from anterior superior iliac spine and the umbilicus [(6)].

Peristomal dermatitis

Peristomal skin care can be difficult for many patients. Dermatitis happens due to excoriation results from continuous moisture around the stoma and the trauma of the repeated applications of the bag [(8)].

Dermatitis and skin maceration around stoma are considered serious problems. The best method of prevention is to fashion a protuberant spout to the colostomy of 2–3 cm in length. This prevents the direct contact of the fluid with the skin [(9)].

Parastomal ulceration

After colostomy formation, some cases complain of skin problems such as parastomal ulceration (PSU) and pyoderma gangrenosum (PG). parastomal ulceration is defined as a discontinuity of the peristomal skin with adjacent inflammation, 1.5 cm or more in diameter. PSU can be early, developing in the first 3 months after surgery when they are caused by infected hematomas or unsuspected fistulae. The later ulcers could be associated with underlying Crohn's disease. Most PSU respond to conventional treatment of curettage and change in appliance techniques. Occasionally relocation of the stoma becomes necessary [(10)].

Stoma necrosis

In the immediate postoperative period, a stoma may look edematous caused by venous engorgement but, as the oedema to the stoma settles, the stoma shrinks in circumference by approximately one third (1/3) [(11)]. However, a 'dusky' stoma warrants close observation. The commonest causes of ischemia are tension on the mesentery or too much trimming of the mesentery at the time of stoma formation. This complication is more commonly seen in obese patients and after emergency stoma formation [(12)]. Various studies have reported different incidence rates for stoma necrosis ranging from 1% to 10% in colostomies [(13)]. If necrosis involves only a few superficial millimeters of the spout, then a 'wait and watch' policy will be successful; however, if the necrosis extends deep to the fascial planes, then an urgent refashioning of the stoma is warranted [(12, 13)].

Stoma retraction

Stoma retraction is defined as any stoma that is 0.5 cm or more below the skin surface. Retraction of stoma is usually noticed within 6 weeks of stoma formation and requires surgical intervention. The commonest underlying cause for stoma retraction is tension on the bowel. It is more commonly seen in patients with a higher body mass index [(13)].

It has been documented that 14% of colostomies develop retraction within 3 weeks after surgery [(13)].

Studies showed that if colostomy is less than 10 mm in height within 48 hours after surgery, it has a 35% chance of being problematic. The ideal length of colostomy should be long enough to avoid skin

excoriation, but not so long in women as to be incompatible with a feminine body image. They recommend a stoma approximately 2.5 cm in length [14].

To prevent tension on the bowel wall for colostomies adequate mobilization is mandatory. This may require full mobilization of the splenic flexure. This maneuver allows one to bring the bowel end to the surface without any tension thus reducing the possibility of retraction [15].

Late complications

Stomal prolapse

Stomal prolapse is defined as an increase in the size of stoma after maturation that requires a change in the appliance or subsequent surgical treatment. Prolapse occurs when a proximal segment of the bowel intussuscepts and slides protrude through the stomal orifice. This can be alarming and frightening experience for the patients [16].

Any stoma can prolapse. Prolapse occurs more frequently with loop colostomies than end colostomies and most frequently involves the efferent (distal) limb [17].

Various etiological factors have been postulated for stomal prolapse including obesity, a large opening in the abdominal wall at the time of stoma formation, conditions causing increased intra-abdominal pressure and a redundant loop of bowel proximal to the stoma [17].

The prolapsed stoma can cause distress for the patient but it is usually of no clinical/functional significance. Symptoms associated with stoma prolapse include pain, skin irritation, difficulty with maintaining an appliance, and can rarely lead to obstruction, incarceration, and strangulation. Ischemia and strangulation could result from excessive edema of the prolapsed loop [18].

When prolapse is associated with any signs of ischemia or gangrene, surgery is the only treatment option which may require reversal if indicated or refashioning of the new stoma after excising the redundant prolapsed bowel [17].

Stomal stenosis

Stomal stenosis is reported in 2–15% of the stomas. It can develop at any time in the postoperative period from a few weeks to years. It is more common in Crohn's patients. It is very rare for stomal stenosis to present as an acute intestinal obstruction [19].

The commonest symptom is a noisy stoma when flatus is passed, which can be distressing and embarrassing for the patients. The problem can be narrowing of the skin trephine which can be treated with a local procedure. The results of dilatation with Hegar's dilators are poor. If the underlying problem is IBD or ischemic stricture of the stoma, then refashioning of the stoma may be required. **Beraldo *et al.*** [19] have described a novel W-plasty technique for dealing with the stenotic stomas.

Peristomal pyoderma gangrenosum

Peristomal Pyoderma gangrenosum (PG) is commonly associated with IBD. The characteristic lesion is an area of ulceration with a well-defined, undermined, violaceous border [20].

Peristomal pyoderma gangrenosum (PPG) is an uncommon subtype of pyoderma gangrenosum occurring near abdominal stoma sites, comprising approximately 15% of all pyoderma gangrenosum cases [20]. It is often misdiagnosed as abscess, contact dermatitis, infection, irritation from stomal leakage, or extension of Crohn's disease. Delayed diagnosis, variable treatment responses, and painful ulceration negatively impact quality of life [21].

Parastomal hernia

The incidence of parastomal hernia varies widely, as it depends on many factors e.g. the duration of follow up, type of stoma, patient characteristics and the definition of occurrence. In a randomized clinical trial, the incidence reaches up to 58% of patients in 7 years follow up after operation [(22)].

Parastomal hernia can be classified into four subtypes, interstitial; where the hernia sac lies within the layers of the abdominal wall, subcutaneous; where the sac lies in the subcutaneous plane, intrastomal; where the sac penetrates into the spout colostomy and peristomal; where the sac is within a prolapsing stoma. The etiology of the Parastomal hernia is similar to that of incisional hernia. The risk factors can be divided into two categories, patient-related and technical. The patient-related risk factors include obesity, poor nutritional state at the time of surgery, steroid therapy, wound sepsis and chronic cough. The technical factors attributed to the development of parastomal hernia include the size of the trephine aperture, whether the surgery is elective or emergency and other factors [(23)].

Parastomal hernia usually leads to a decrease in the quality of life for patients, as with increasing the size of the stoma, it may cause inconvenience and discomfort to patients who may also experience difficulties in fitting the stoma appliance. In addition, an inability to conceal the hernia may be a source of social embarrassment. Strangulation, obstruction and perforation are rare but serious complications [(24)].

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