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# Intestinal Ostomy Complications and Care

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## Abstract

The management of patients submitted to intestinal stomas (ileostomy or colostomy) and description of the routine care and main complications are the scope of the chapter. The impact of the stoma on patients' daily life with a functional list of capabilities they can exert with security and illustrations of the commonest drawbacks are also discussed. A series of pictures showing the most commonly occurring complications depicted in the section Problems and complications help to a better understanding of the author's intended message. Finally in the "References" topic, it was tried to cite society-based guidelines and review papers concerning ostomy care and complications.

**Keywords:** colostomy and ileostomy management, complications, peristomal hernia, prolapse, retraction, necrosis

## 1. Introduction

An ostomy is a surgically created opening between a hollow organ and the body surface or between two hollow organs. The surgical interventions which result in ostomies are based on the need to modify the natural way of ingestion of food or excretion of waste products. The word *ostomy* comes from the Latin word *ostium*, meaning mouth or opening, plus the suffix *-tomy*, implying a surgical or injury state. The word *stoma* comes from the Greek word for mouth and is used interchangeably with ostomy.

Depending on the organ involved, an ostomy is further characterized by adding the name of the organ involved: gastrostomy to indicate an opening from the stomach to the skin, an ileostomy from the ileum to the skin, and a colostomy from the colon. In addition an anastomosis between the small bowel and colon is called *ileocolostomy*; between sigmoid colon and the rectum, a *sigmoidorectostomy*; and between the stomach and the jejunum, a *gastrojejunosomy*. A loop ostomy is built by bringing a loop of bowel through the skin and then dividing the antimesenteric border and maturing it so that there are two open lumens, the proximal and the distal.

An ostomy can be created virtually anywhere along the gastrointestinal tract. For diversion of the fecal stream, the most common ostomies involve the distal small intestine (ileostomy) and large intestine (colostomy).

Temporary or permanent fecal diversions by the creation of an ostomy, which is a purposeful anastomosis between a segment of the gastrointestinal tract and the skin of the anterior abdominal wall, may be needed to manage a variety of

pathologic conditions, including congenital anomalies, colon obstruction, inflammatory bowel disease, traumatic disruption of the intestinal tract, or gastrointestinal malignancy, when restoration of intestinal continuity is contraindicated or not immediately feasible given the patient's clinical condition. End ostomy is the name indicative of a hollow viscera pull to the skin as a terminal opening. In this way only one open lumen is viewed. The majority of ostomies today are created as a temporary measure, although the ostomies with a permanent intention are not rare. Construction of an ostomy should always be performed using a segment of healthy, well-vascularized bowel. Expected difficulties arise in morbidly obese patients or those with extensive adhesions.

This chapter will discuss ostomies brought to the surface of the body, focusing primarily on ileostomy and colostomy complications with the proposed treatment approach.

Even when the stoma is technically adequate, alterations on the corporal image, lifestyle, and sexuality, as well as the need for auto care may occur leading to social and psychological disturbances which difficult the individual social adaptation [1].

## **2. Ostomy planning**

### **2.1 Counseling**

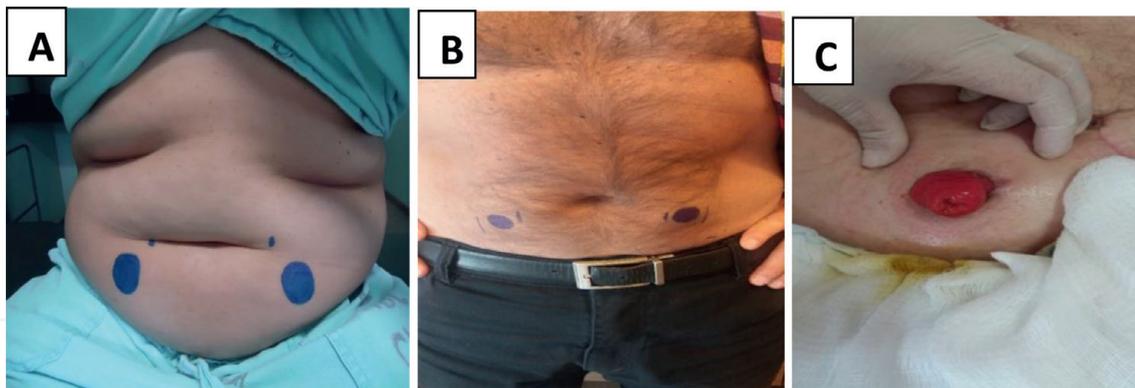
The multiple aspects involved in rehabilitation of patients with an ostomy including the medical and nursing care must be initiated at the moment of the indication and extended until a complete adaptation of the patient with the new situation occurs.

Preoperative preparation prior to planned ostomy creation includes stoma site selection, emotional support, and patient education, as well as early planning for subsequent discharge, ongoing rehabilitation care for the patient and family, and outpatient follow-up.

Patients who require an ostomy for fecal diversion often experience physical, psychological, and emotional stress related to misconceptions and fears regarding social acceptance, sexuality, and economic burden. To allay these fears, preoperative education, counseling, and ostomy site selection should be undertaken, whenever possible, from a skilled ostomy nurse specialist. Several aspects going from the initial patient's approach with clarification of doubts about diagnosis, familiar history, intestinal habit, medicines, social activities, emotional state, psychomotor skills, and schooling to skin conditions' evaluation are important to provide a proper knowledge about the medical condition and adequately educate the patient. To achieve the autonomy about the ostomy care, the patient should be oriented toward maintaining a well-recognized standard of care, with decrease of complications. In addition to improved overall quality of life, preoperative counseling is associated with decreased stoma-related postoperative complications, improved postoperative patient stoma proficiency, and earlier discharge from the hospital [2, 3].

### **2.2 Site selection and marking**

Proper site selection is essential for minimizing postoperative complications and achieving a good postoperative quality of life. A poor site selection is more likely in patients undergoing emergency surgery compared with elective surgery. Obesity, scars, type of surgery (emergency or elective), underlying disease,



**Figure 1.** *Stoma site demarcation. This is an important step to achieve a technically good result after ostomy confection allowing adequate pouch adaptation, especially in obese patients with skin folds (A), permitting the natural wear of belts and cloths (B). The ideal appearance of an ostomy is depicted at C.*

abdominal wall contour (sitting and standing), prior abdominal incisions, bony prominences, occupation, clothing style, and physical activity impairment can be cited as factors which difficult the adequate site of an abdominal stoma [4] (**Figure 1A** and **B**).

Once selected the ostomy site, laparoscopic approach is a safe and effective alternative to laparotomy for creating a loop ostomy. The advantages of the laparoscopic approach are that it provides an excellent view of the abdominal cavity and minimizes the risks and complications of an open procedure. Whatever surgical approach is used, the goal is to obtain a stoma technically in good conditions in order to prevent complications (**Figure 1C**).

### 3. Intestinal ostomies: routine care

Many pouching systems are available, as either one- or two-piece systems. The main functions of ostomy pouches are to contain the ostomy effluent, contain odor, and protect the peristomal skin. The patient should be taught strategies that can help promote pouch adherence to the skin and minimize leakage. Occasional leakage is common and is nothing to be concerned about. However, if the leak is constant, a double check of the stoma bag is advisable. A stoma leakage usually results from a stoma bag that has not been fitted correctly leaving gaps in the wafer and the hole does not fit snugly around the stoma. If this happens an ostomate nurse should be contacted for advice and eventual adjustments [5].

#### 3.1 Protecting the peristomal skin

The protection of peristomal skin is better achieved with simple measures such as:

1. Selecting a bag system that conforms to the abdominal contour at the stoma location
2. Sizing the opening of the barrier ring to minimize the amount of exposed skin
3. Using adjunctive products to improve the fixation of the pouch (adhesive agents, Skin Prep) and to prevent irritation and injury of the skin (skin barrier paste and powder)

The abdominal skin around the stoma should always look the same as the skin anywhere else on the abdomen. Ostomy output can make this skin tender or sore. To prevent skin dermatitis, the American Cancer Society recommends:

1. Use the right size pouch and skin barrier opening. An opening that's too small can cut or injure the stoma and may cause it to swell. If the opening is too large, output could get to and irritate the skin.
2. Change the pouching system regularly to avoid leaks and skin irritation.
3. Do not rip the pouching system away from the skin or remove it more than once a day unless there's a problem.
4. Clean the skin around the stoma with water, and dry the skin completely before putting on a skin barrier or adapting the pouch.
5. Watch for sensitivities and allergies (to the adhesive, skin barrier, paste, tape, or pouch material).
6. Patch testing different products for skin sensitivity or allergies.

Loop ileostomies are typically more difficult to manage than end ileostomies because the stoma frequently empties close to the skin surface [6].

### **3.2 Emptying and changing the ostomy pouching system**

It is important that the patient be taught how to change and empty the pouching system before leaving the hospital. The use of sterile supplies is not necessary. Toilet paper, facial tissue, or paper towels can be used to clean around the stoma instead of sterile gauze pads.

### **3.3 How to empty the pouch**

Odor and gas are common concerns for any individual with an ostomy.

The patient should be assured that ostomy pouches are odor-proof, but when the pouch is emptied, odor is normal. Simple strategies can help reduce odor.

- I. To keep bulging and leaking, it's recommended emptying the ostomy pouch when it is about 1/3 full. To empty the pouch, the patient should adopt the following steps:
  1. Sit as far back on the toilet as you can or on a chair facing the toilet.
  2. Place a small strip of toilet paper in the toilet to decrease splashing.
  3. Hold the bottom of the pouch up and open the clip at the end or tail of the pouch.
  4. Slowly unroll the tail over the toilet.
  5. Gently empty the contents.
  6. Clean the outside and inside of the pouch tail with toilet paper.

7. Roll up the end of the pouch and clip.
8. Change the pouch one to two times weekly and as needed for any signs of leakage, itching, or burning of the peristomal skin.
9. Keep the tail of the pouch clean so that it does not become a source of odor. This can be accomplished by everting the tail of a pouch prior to emptying it.
10. Use a room spray or pouch deodorant to minimize odor associated with emptying.

### **3.4 Time to change the pouching system**

Different pouching systems are made to last different lengths of time. Some are changed every day, some every 3 days or so, and some just once a week. It depends on the type of pouch used. There may be less bowel activity at certain times of the day. It's easiest to change the pouching system during these times. Every patient establishes its own preference about the proper time to change the pouch. Some prefer early morning before breakfast and some allow at least 1 h after a meal. Right after surgery, ostomy output may be thin and watery and the bowel discharges unpredictable. As the output gets thicker, it becomes easier to select the best time for changing.

### **3.5 The pouching system seal**

The pouching system must stick to the skin. It's important to change it before it loosens or leaks. The length of time a pouch will stay sealed to the skin depends on many things, such as the weather, skin condition, scars, weight changes, diet, activity, body shape near the stoma, and the nature of the ostomy output.

Other factors may affect how long a pouch sticks to the skin. Among them it can be cited:

1. Sweating will shorten the number of days the pouching system can be worn.
2. Body heat and outside temperature cause skin barriers to loosen more quickly than usual.
3. Moist, oily skin may reduce wearing time.
4. Weight changes will affect how long you can wear a pouch. Gaining or losing weight after stoma surgery can change the abdominal shape with need for use of an entirely different system.
5. Diet may affect the seal. Foods that cause watery output are more likely to break a seal than a thicker discharge.
6. Physical activities may affect wearing time. Swimming, very strenuous sports, or anything that intensifies sweat may shorten wear time [7].

### **3.6 Bathing**

To take a shower is possible with or without a pouching system in place. Normal exposure to air or contact with soap and water will not harm the stoma. Water will

not flow into the stoma. Soap will not irritate it, but soap may interfere with the skin barrier sticking to the skin. Taking a bath without the pouching system is however highly impractical for the most obvious of reasons, primarily the risk of fecal output while bathing, which cannot be controlled. It's best to only use water while cleaning the skin around your stoma. If soap is used, one must be sure to rinse the skin well.

### **3.7 Shaving hair under the pouch**

Having a lot of hair around the stoma can make it hard to get the skin barrier to stick well and may cause pain when the pouch is removed. It is advisable whenever possible to trim instead of shaving with a blade the skin hairs around the stoma to prevent skin scarification and inflammatory reaction. However if the hair density is high and shaving is indicated, it is recommended a dry shave of the skin around the stoma with stoma powder, since soap and shaving creams have lotions and oils that may impair the skin barrier sticking. After shaving, the skin must be rinsed well and dried before applying a pouch.

### **3.8 What to wear when having a colostomy**

No special clothes for everyday wear are needed. Ostomy pouches are fairly flat and hard to see under most clothing. The pressure of elastic undergarments will not harm the stoma or prevent bowel function.

If the ostomate gains weight after the ostomy surgery, this can affect the clothes he was used to more than the pouching system itself.

Snug undergarments such as cotton stretch underpants, T-shirts, or camisoles may give an extra support, security, and help conceal pouches. A simple pouch cover adds comfort by absorbing body sweat and keeps the plastic pouch from resting against your skin. Men can wear either boxer or jockey-type shorts.

## **4. Ostomy problems and complications**

The construction of an intestinal stoma should not be considered a trivial undertaking. Serious complications requiring immediate reoperations can occur, as can minor problems that will subject the patient to daily and nightly distress. Intestinal stomas undoubtedly will dramatically change lifestyles. Patients will experience physiologic and psychologic detriment with stoma-related problems [8].

- Activities

A common concern for many patients is the impact of the stoma on activities of daily living. The patient can be reassured that most activities can be safely resumed with minimal, if any, modifications. As an example, bathing and showering can be performed with the pouch on or off, and clothing modifications are generally not required. Most sports activities can be resumed as well, with the exception of extreme contact sports, which could potentially damage the stoma. The addition of a belt or binder is helpful in maintaining a pouch seal during vigorous activity and with perspiration.

- Sex

Sexual activity is a particular concern for many patients with an ostomy. Patient counseling should address questions regarding sexual activity and partner

response. The ostomy by itself does not affect organic sexual function; however it is advised to empty the pouch and assure an intact pouch seal before engaging in sexual activity [9].

- Travel

Patients who are traveling should be advised to take extra ostomy supplies, to avoid exposing ostomy pouches and adhesives to extreme temperatures, which may alter the adhesive quality, and drink only bottled water if tap water is not known to be safe.

#### **4.1 Risk factors for stomal complications**

The main risk factors for the occurrence of stoma complications are:

1. Age.
2. Comorbidity—*inflammatory bowel diseases, diverticulitis.*
3. Obesity.
4. Precocious physical effort.
5. Stoma type—*ileostomies are more prone for the complication occurrence than colostomy or gastrostomy.*
6. Stoma protrusion.
7. Type of surgery—*emergency surgery is more likely to evolve with complication.*
8. Stoma site—*lack of preoperative demarcation leading to inadequate stoma placement.*
9. Quality of stomal bag devices.
10. Inadequate stoma care—*the ideal care is provided by specialized nurse.*

#### **4.2 Functional complications**

- Output

Patients with colostomy or ileostomy experiment physiologic changes related to the loss of continence and reduced ileal and colonic absorptive surface area with consequent fluid and electrolyte balance disturbances and lifestyle adaptation but generally with little effect on nutrition. It should be emphasized that if more than 50 cm terminal ileum is resected, nutritional consequences are likely to occur [10].

Ostomy output is related to the location of the opening in the bowel, as the more proximal the ostomy, the less surface area is available for water and electrolyte absorption and so the more liquid the stools. Right-sided colostomies, for example, not only produce a high volume but also have the additional disadvantage of a malodorous output because of the effects of colonic bacteria.

The type and volume of output (effluent), and therefore fluid loss, are determined by the location of the stoma relative to the ileocecal valve. Ileostomies, cecostomies, and ascending colostomies typically produce output (effluent) >500 mL/day that contains digestive enzymes, which is irritating to the mucosa and skin, while descending/sigmoid colostomies produce stool that does not contain digestive enzymes.

The output from an ileostomy tends to be fairly watery and green or bilious in color. Within a few weeks of resumption of a regular diet, the material becomes thicker and more yellow-brown, with a watery porridge or applesauce consistency. Depending on the amount of small bowel removed, the output is looser, and the patient is more prone to dehydration. Most ileostomates notice little odor from the output, but, certain foods (e.g., eggs and fish) may produce an offensive smell.

The ostomy output is also affected by diet, fluid intake, medications, and organic problems such as Crohn's disease or adhesions. Diarrhea, frequent loose or watery bowel movements in greater amounts, than expected, is a warning that something is not right. It can come suddenly and may cause cramps. The causes of diarrhea are variable: diet, emotional stress, intestinal infection, antibiotics, and short bowel syndrome.

- Volume

In a healthy individual, 1000–2000 mL of fluid passes through the ileocecal valve daily. This volume is reduced to 100–200 mL in normal stool as it passes through the colon. So a left-sided colostomy output is similar in volume and composition to the feces that would be passed transanally. The volume of ileostomy output varies fairly widely among patients but only mildly from day to day in a single individual. In the early postoperative period, the ileostomy output is 1000–1500 ml/day. In a few days, this volume is reduced to about 500 ml, even with no dietary restrictions; however it is known that fatty food and large amounts of liquid increase transit and the fluidity of the effluent.

- Transit

Resection of anus and/or colon affects the function of the proximal GI tract and the integration of endocrine and neuroenteric activities. It seems that small bowel transit time decrease after ileostomy due to adaptation to the new condition whose mechanisms are not yet well understood.

Microbial flora of an individual is fairly stable over time, whereas there is great variability among individuals. After creation of an ileostomy, the distal ileum is rapidly colonized with a variety of bacteria.

- Nutrition

The colon has little role in the maintenance of normal nutrition, working primarily to absorb fluid and to store feces. Thus, removal of the colon has little effect on nutrition. However, loss of part of the terminal ileum may result in loss of bile acids and poor absorption of fat and fat-soluble vitamins. Vitamin B12 may also not be adequately absorbed in patients with terminal ileal loss that may result in pernicious or macrocytic anemia requiring monthly administration of vitamin B12. Absorption may also be impeded by ileal bacterial overgrowth. Kidney stones may be a consequence of chronic dehydration and acid urine. Adding sodium bicarbonate to the diet and increasing fluid intake may help to prevent uric acid stone formation.

### **4.3 Technical and anatomic stoma-related complications**

Proper creation, management, and closure of ostomy are critical both for the treatment of specific disorders and for the peace of mind of the patient. A poor site selection contributes to the rate of stomal complications and is more likely to occur in patients undergoing emergency surgery compared with elective surgery. Other risk factors for stomal problems include:

- Height of stoma <10 mm
- Tobacco usage
- Comorbid conditions (obesity, inflammatory bowel disease, diabetes)

The rates for stomal complications range from 14 to 79%. Peristomal dermatitis is the most common complication. Other complications include poor stoma siting, high output, ischemia, retraction, parastomal hernia formation, stomal stenosis, bleeding, and prolapse. Surgeons should be cognizant of these complications before, during, and after stoma creation, and adequate measures should be taken to avoid them [11].

Stomal and peristomal complications can occur in the early postoperative period or many years later. Complications occurring in the course of days after surgery are often related to technical issues. Those occurring within 3 months of stoma construction—necrosis, bleeding, retraction, and mucocutaneous separation—are more frequently related to suboptimal stoma site selection. Late stomal complications are generally described for permanent ostomies and include parastomal hernia, stomal prolapse, and stenosis. The site of closure of the ostomy can be associated with complications such as delayed healing, infection, and hernia formation.

Loop ileostomies have higher complication rates when compared to end colostomy or end ileostomy and with loop colostomy. The most common problems of end and loop ileostomies are dehydration, skin irritation, and small bowel obstruction. Prolapse can occur in all types of stomas but is more prevalent in loop colostomies, especially those constructed using the transverse colon.

### **4.4 Time-related complications**

- I. Immediate—occurring up to 24 h after stoma placement. The more common immediate complications are edema, bleeding, ischemia, and necrosis.
- II. Early—occur 1–15 days after surgery. The more common are retraction, mucocutaneous detachment, peristomal evisceration, and peristomal fistula.
- III. Late—occur from 15 days to months after surgery. Retraction, stenosis, prolapse, granuloma, and peristomal hernia are examples of the more important late complications.

#### *4.4.1 Peristomal skin complications*

- I. Dermatitis
- II. Venous varices

III. Pseudoverrucous lesions

IV. Bacterial and fungal infections

*4.4.2 When the ostomate should call the doctor or ostomy nurse*

- Cramps lasting more than 2 or 3 h
- Continuous nausea and vomiting
- No ostomy output for 4–6 h with cramping and nausea
- Severe watery discharge lasting more than 5 or 6 h
- Bad odor lasting more than a week (this may be a sign of infection.)
- A cut in the stoma
- Injury to the stoma
- Bad skin irritation or deep sores (ulcers)
- A lot of bleeding from the stoma opening (or a moderate amount in the pouch that you notice several times when emptying it)
- Continuous bleeding where the stoma meets the skin
- Unusual change in your stoma size or color
- Anything unusual going on with your ostomy

The complication occurrence in intestinal stomas might be related to factors such as lack of demarcation of the skin site, surgical technique itself, or to postoperative care. Each type of complication deserves a different treatment approach. For sure a prompt intervention is advisable to avoid or to minimize the complication occurrence.

## **5. Illustration of more common ostomy complications**

The more common type of ostomy complications are:

1. Mucosal edema
2. Peristomal dermatitis
3. Retraction
4. Ostomy prolapse
5. Mucosal/skin detachment
6. Hematoma

7. Necrosis

8. Parastomal hernia

9. Stenosis

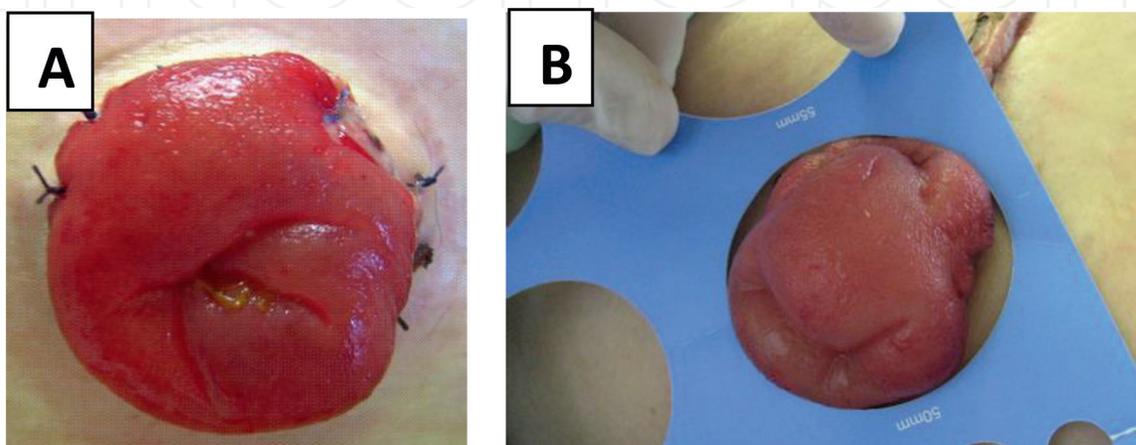
The following pictures are illustrative examples of these complications.

### 5.1 Mucosal edema

On the practical settings, edema may not be considered as a true complication as it can result from a normal physiological response after manipulation of intestinal loop. It is normal for the stoma to be edematous postoperatively looking swollen within 4–6 hours. The swelling progresses for the first 2 days and by the fifth day subsides markedly. The edema continues to decrease for the first 6–8 weeks after surgery. While edematous, the stomal mucosa is pale and translucent and the stoma tissue remains soft. The main approach to treat an ostomy edema is observation plus the care with manipulation and correct application of pouch, to avoid mechanical trauma. It should be reminded that if the edema is caused by technical problems, e.g., a narrowed abdominal wall opening, it may be advisable to reoperate in order to correct the problem [11] (Figure 2).

### 5.2 Peristomal dermatitis

Peristomal dermatitis is the most common stoma complication. It is characterized by skin irritation around the stoma, caused by several factors: irritation of the skin by feces, contact or products used in ostomy care which may be corrosive, contact allergy due to the nature of the chemical component of the pouch in contact with the skin, mechanical infection by pouch withdrawal-induced trauma or by compression of the fixation belt, and bacterial or fungal skin infection caused by humidity and effluent from gut making the peristomal skin more vulnerable to microorganisms' proliferation. The most common symptoms are itching, burning sensation, and pain. Diabetic, immunocompromised, and long-term use of antibiotics increase the risk of infectious dermatitis in patients with intestinal stomas [12, 13] (Figure 3).



**Figure 2.** Ileostomy edema. Usual appearance; (B) care to apply the bag avoiding trauma. The stoma measurement selected for the pouching system should allow for an opening 1/8 inch to prevent stoma necrosis.



**Figure 3.** Peristomal dermatitis. Irritation caused by the effluent in an inadequate pouch adaptation to the skin allowing the prolonged feces/skin contact (A) and an early pouch detachment (B). Blister at the adhesive area in the periphery of pouch resin itself (C). Dermatitis caused by both pouch resin and peripheral adhesive (D). Dermatitis due to contact of feces with skin (E). Fungal dermatitis (F).

### 5.3 Retraction

A stoma normally protrudes slightly above the skin level being more evident in ileostomies than in colostomies. A retraction of the stoma occurs when the stoma lays flat to the skin or below the skin surface level. Retraction has been reported to occur in as many as 10–24% of all ostomates, can be partial involving the skin and subcutaneous tissue or complete when the stoma is below the level of the fascia, can occur early or late after ostomy, and may result from a poor surgical stoma construction with consequent exteriorization of intestinal loop under tension, insufficient stomal length, poor fixation of the loop to the abdominal wall, or lack of ostomy support. It can also be secondary to abdominal structure anomalies such as thick abdominal wall related to edema, distention, or obesity. The premature removal of the loop device to support the intestine outside the abdominal wall may also contribute to this complication as well as the later scar formation secondary to healing of a mucocutaneous separation or of a necrotic stoma or even chronic peristomal irritation that healed with scar or adhesion at the mucocutaneous junction.

The retraction can become problematic as it can affect the fit of the stoma bag and cause leaks, which can lead to sore and broken skin. This can be rectified by using a stoma bag with a convex wafer to push the stoma forward, an ostomy belt to help support the stoma, and/or barrier rings or a barrier paste to help keep the output off the skin. The depth of retraction may increase with sitting and can vary with peristalsis. Patients with retracted stomas present with effluent undermining the pouching system, persistent leakage, shortened pouch wear time, and resultant peristomal irritant dermatitis [11].

The proper care will depend on a close observation of peristomal area, to prevent worsening of the retraction. The goal of managing a retracted stoma is to maintain a secure seal between the pouch and the skin. Conservative treatment with convex devices attached to the belt and protective skin pastes to fulfill spaces and leveling the interface skin/stoma may solve most cases, but surgical revision

should be indicated when a good pouching seal cannot be obtained and skin irritation persists. It should be reminded that complete circumferential mucocutaneous separation accompanied with stomal retraction below the fascia may be a surgical emergency as it can lead to peritonitis (**Figure 4**).

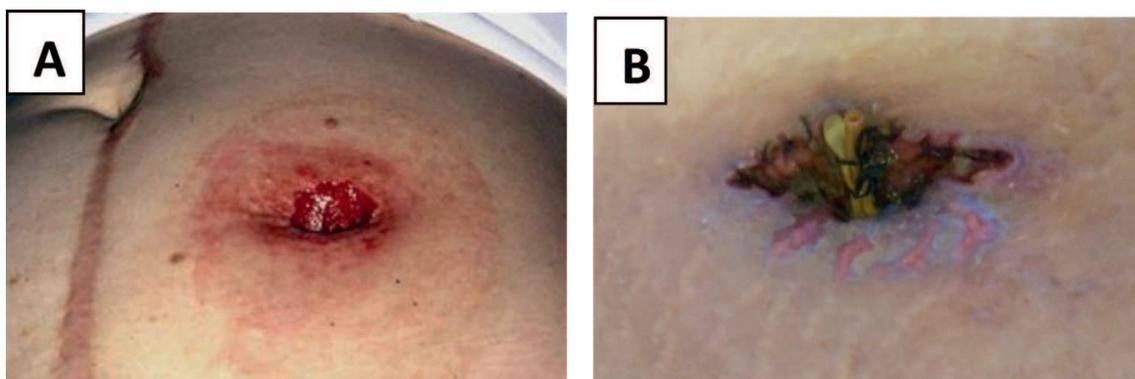
#### 5.4 Prolapse

Prolapse is the term used to describe the telescoping out of the bowel through the stoma. As a consequence the stoma lengthens and becomes more susceptible to abrasion or infection. Prolapse can be partial or complete, and either the distal or the proximal segment of the loop ostomy may prolapse being the distal portion of the bowel the most frequent site to prolapse. The etiology can involve stoma construction difficulties including a weak abdominal wall with poorly developed fascial support; creation of excessively large opening in the abdominal wall; positioning the stoma out of the rectus abdominal muscle; postoperative increase of the abdominal pressure due to obesity, cough, or pregnancy; bowel edema; and inadequate fixation of the bowel to the abdominal wall [14].

Clinically the prolapse increases the size and the length of the stoma and makes the patient's ability to conceal the stoma beneath clothing difficult. Also the edematous stoma bleeds and is more prone to trauma. A prolapsed stoma could also become obstructed making it impossible for feces to pass through what can lead to ischemia and alteration of the color that appears purple or cyanotic. Stomal irritation, bleeding, necrosis, and gangrene of the distal end of the prolapsed stoma may be seen in chronic prolapse. Conservative management includes tender manual reduction of the prolapse, appliance of a hernia type to exert a mild compression, cold dressing to induce vasoconstriction, use of sugar to induce osmotic force to decrease the amount of liquid into the intestinal layers, and ostomate lying down position. The goal of care is to provide a leak-proof pouching system applied while the patient is supine and the prolapse reduced. Surgical correction of prolapse is indicated for definitive ostomies with prediction of long permanence time and involves resection of the prolapse and stoma reconstruction. Temporary prolapse is best treated at the time of reconstruction of intestinal transit [15] (**Figure 5**).

#### 5.5 Mucocutaneous detachment

Mucocutaneous detachment is the separation of the stoma from the peristomal skin. It can be partial with area of separation shallow or deep or circumferential. Usually it is caused by factors such as (a) secondary to retraction or necrosis; (b) sequel of poor healing from an underlying disease process, more commonly in



**Figure 4.**  
*Ostomy retraction with light (A) and severe inflammatory reaction.*



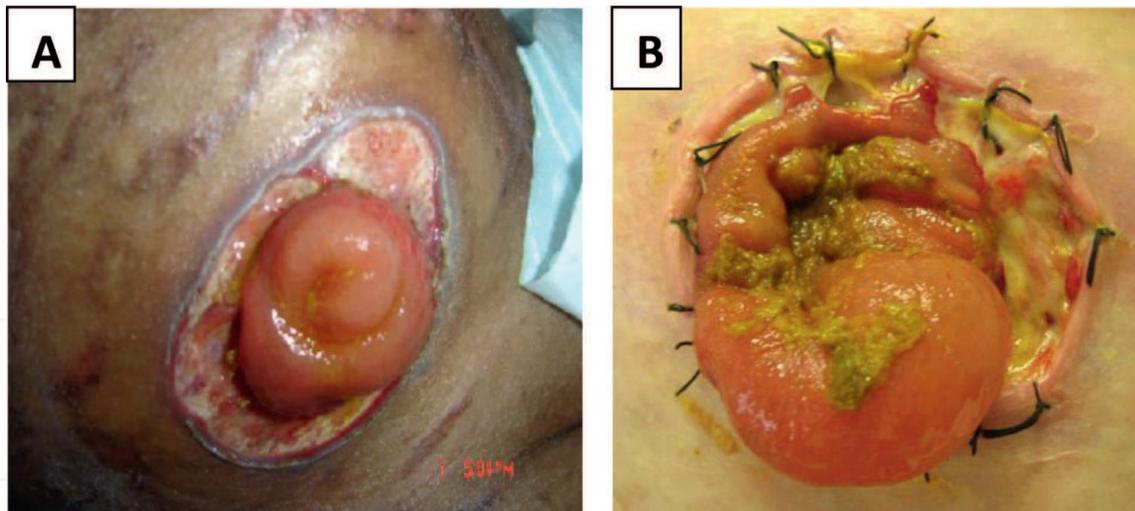
**Figure 5.** *Stoma prolapse. Note the abnormal length of the stoma. If left untreated the ostomate is more susceptible to abrasions or infection.*

the immunocompromised patient related to malnutrition, corticosteroid therapy, diabetes, infection, or post-radiation therapy that result in superficial infection and poor healing; and/or (c) iatrogenic, e.g., creating an oversized opening in the skin when forming the stoma or excessive tension on the suture line, causing a separation of the mucocutaneous junction in the immediate postoperative phase of healing. The ostomate may complain of pain or burning. Assessing the tissue type at the base of the separation often reveals fibrin slough that produces mild to moderate amount of drainage. Stool or urine draining from this site may indicate a fistula. The treatment is conservative consisting of cleaning the wound and use of calcium alginate and hydrofiber. Antibiotics may be indicated for superficial detachment until completion of the healing process. In cases of mucocutaneous separation extending to below the fascia, surgery may be necessary to avoid contamination of the abdominal cavity and peritonitis [11] (**Figure 6**).

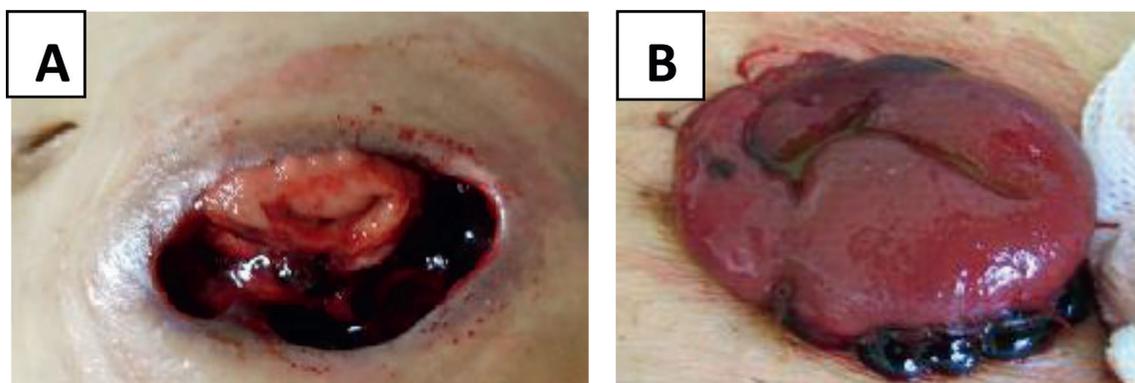
### 5.6 Bleeding and hematoma

The abundant vascularization of the stoma with delicate blood vessels near to the top facilitates bleeding easily. Spots of blood are not a cause for alarm. Cleaning around the stoma as you change the pouch or skin barrier may cause slight bleeding. If the bag has rubbed around the stoma or the blood comes around the edges while the stoma is being cleaned might not be a cause for concern. However if the bleeding is coming from inside the stoma, then it is important to contact your stoma nurse or your doctor for evaluation. The bleeding originating at the mucosal surface will usually stop quickly.

Light bleeding that does not stop spontaneously or excessive bleeding from the stoma usually at the mucocutaneous junction is more frequent in the immediate postoperative period, although it can also occur later. Bleeding may occur due to inadequate hemostasis during stoma construction, portal hypertension, trauma, underlying disease, and because of some medications, such as prolonged use of analgesic anti-inflammatory drugs, blood thinners, and chemotherapy. A correct diagnosis is mandatory to differentiate the mucosal mild trauma-associated bleeding during a pouching system change from other causes that may need even a surgical approach. The adequate treatment will depend on the etiology of bleeding.



**Figure 6.**  
*Mucocutaneous detachment. (A) Usual appearance and (B) mucocutaneous separation due to peristomal infection.*



**Figure 7.**  
*Bleeding in a mucocutaneous detachment (A) and hematoma at the stoma fixing suture (B).*

If the bleeding persists and is superficial and does not stop spontaneously, cauterization, suture placement, topical hemostatic agents (silver nitrate), or direct pressure are required procedures. Frank bleeding presenting as blood that runs down the abdominal wall requires immediate notification of the surgeon. The surgeon removes sutures, lifts the mucosa, secures the vessel with fine forceps, and ligates the bleeder. Portal hypertension induces varices around the stoma resulting in bleeding from the mucocutaneous junction. If severe, it may require sclerotherapy or portosystemic shunting. The most common cause of pharmacological bleeding is the adverse effect of prolonged use of analgesic anti-inflammatory drugs. When bleeding occurs in the late PO period, it may be associated with incorrect use of the ostomy pouch or trauma that can happen following practice of aggressive sports, for example. The management includes the use of compression with a cold dressing. A transparent plastic pouch should be used to permit a direct observation of the stoma allowing quick detection of bleeding or hematoma [15] (**Figure 7**).

### 5.7 Necrosis

Necrosis may occur when the blood flow to or from the stoma is impaired or interrupted, resulting in severe tissue ischemia with impairment of stoma viability or tissue death. Initially the mucosa turns pale evolving to a purple, brown, and black color. The consistency becomes soft or hard and dry with loss of the characteristic brightness of a normal mucosa. The causes for stoma necrosis are extensive

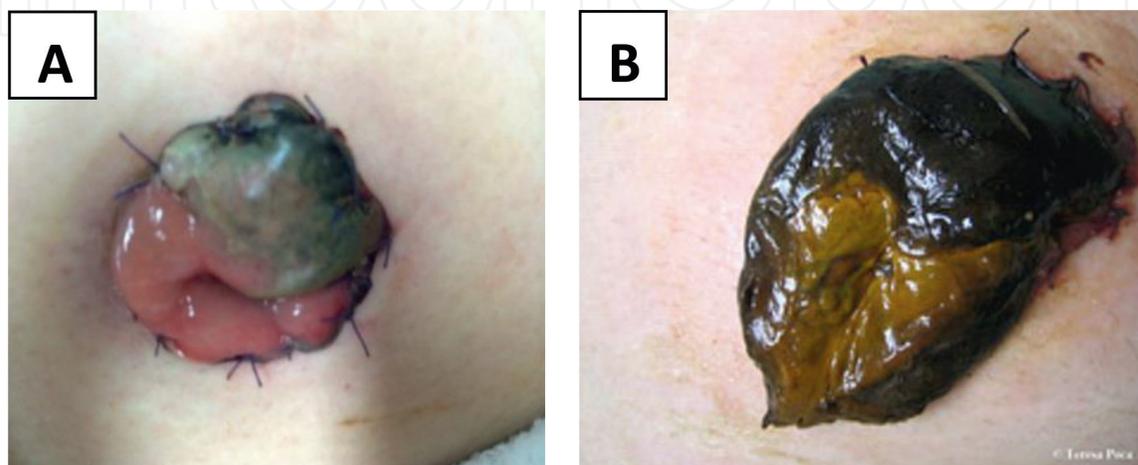
tension on the mesentery, excessive stripping of the mesentery, sutures too narrowly spaced, or constricting sutures. It also can result from interruption of blood flow secondary to embolization or because of abdominal structure anomalies such as thick abdominal wall secondary to edema, distention, or obesity. A higher rate of necrosis has been reported in obese and acutely ill patients.

Observation in cases of superficial or partial (less than one third of circumference) mucosal necrosis is the best approach. Debridement of the necrotic area can define the extension and deepness of necrosis. If the process compromises the whole intestinal wall or extends beyond the aponeurotic plan, a surgical intervention is indicated through the stoma opening or through the main surgical wound if a laparotomy had been performed. The use of two-piece pouch facilitates the daily observation of the stoma with no need of withdrawal of the skin attached piece. Postoperative nursing assessment and management also help prevent potential impairment of a good blood supply to the stoma [11, 16] (**Figure 8**).

### 5.8 Parastomal hernia

The parastomal hernia, a protrusion of the bowel or loops of intestine through the fascial opening into the subcutaneous tissue around the stoma, occurs months to years after surgery because of surgical technical error or following gradual enlargement of the fascial defect. The incidence rate for parastomal hernia varies with the type and age of the stoma and with surgical technique. It is caused by lack of preoperative demarcation of stoma site with exteriorization outside the rectus abdominal muscle. The main risk factors are intra-abdominal pressure, advanced age, obesity, chronic cough, and long-term use of corticosteroids. If the cause is associated to slight peristomal weakness, a common finding in patients with colostomy, surgical correction is usually not necessary. However some hernias interfere with the proper use of the pouch, and surgery for hernia correction is mandatory [17].

Parastomal hernia presents as a bulge around the stoma and may be partial or circumferential. In supine position the bulge may reduce in size, whereas sitting or standing position, Valsalva maneuver, or cough tends to protrude the hernia, whereas lying down and stoma manual compression intrude the hernia back to the abdomen. The hernia change in position makes the pouching seal more difficult. CT scan with oral contrast confirms the diagnosis. The patient may complain a feeling of discomfort or fullness, and if the stoma incarcerates, the patient presents with an acute obstructed abdomen. The use of support binders when prolonged episodes of

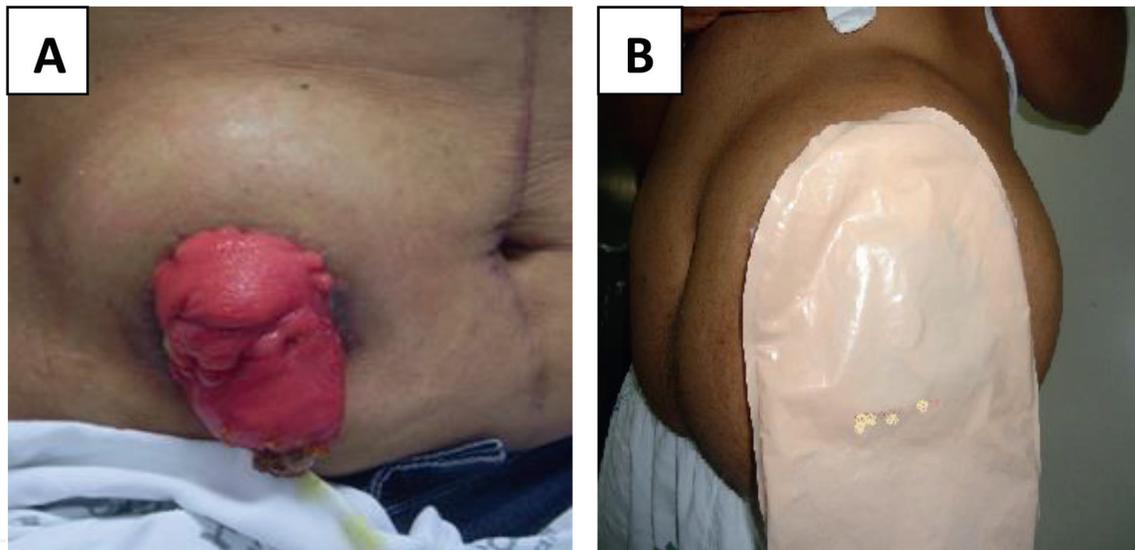


**Figure 8.** Stoma necrosis. (A) Partial necrosis; (B) extensive necrosis. An endoscopy is useful to evaluate if the necrosis extends below the level of the fascia. Surgery may be necessary.

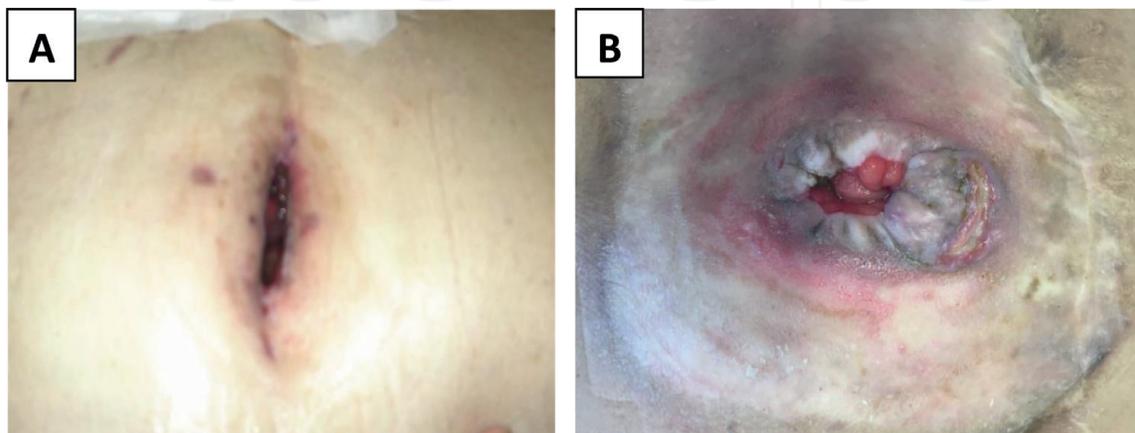
increased intra-abdominal pressures are expected (e.g., heavy lifting or hard physical activity) is recommended. Asymptomatic patients can be treated conservatively by the use of support belt or binder, for example, by constipation prevention with diet modification and laxative or stool softener. If signs of obstruction, incarceration, perforation, or recurrent pouching difficulties are present, the patient should be referred to a surgeon. Surgery repair of parastomal hernia can be done by fascial repair, prosthetic mesh, or stoma relocation; however recurrence rates after surgical treatment vary from 33 to 76% [17, 18] (**Figure 9**).

### 5.9 Stenosis

Stenosis of the stomy opening is characterized by stricture or retraction which makes drainage of the intestinal effluent more difficult. Its incidence is related to the surgical technique itself or as a consequence of precocious complications such as partial necrosis, recurrent inflammatory processes, Crohn's disease, weight gain, and tumor recurrence. The symptoms include abdominal excess of gases, frequent cramps and diarrhea, as well as thin feces. The best option for the treatment of this complication is surgery, but increase of hydric ingestion and eating foods which favor the feces softening may improve the ostomy output [4, 5] (**Figure 10**).



**Figure 9.**  
*Parastomal hernia in a prolapsed stoma (A) and a huge parastomal hernia (B).*



**Figure 10.**  
*Stoma stenosis. Note the retraction of skin (A) and the scar tissue around the stoma opening in a chronic stoma stenosis (B).*

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