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Colostomy on CT and fluoroscopy: What the radiologist needs to know

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ABSTRACT

Colostomies are commonly created in conjunction with colorectal surgery performed for both malignant and benign indications. Familiarity with the different types of colostomies and their normal imaging appearance will improve radiologic detection and characterization of colostomy complications. The radiologist plays a large role in assessment of colostomy patients either via fluoroscopic technique or multidetector computed tomography (CT) in order to help identify ostomy complications or to aid the surgeon prior to colostomy reversal. In this article, we will review: (1) the types of colostomies and indications for their creation; (2) the proper radiographic technique of ostomy evaluation; and (3) the potential complications of colostomies and their imaging manifestations.

1. Introduction

1.1. Definition

A colostomy is an artificial opening created by anastomosing the colon to the anterior abdominal wall. The two most common indications for a colostomy are: decompression of obstructed colon (which is most commonly due to colon cancer or complicated diverticulitis) and diversion of the fecal stream to protect a distal anastomosis at risk for leak. Colostomies may occasionally be created in patients with fecal incontinence, rectovaginal fistula, radiation proctitis and perineal gangrene or after trauma with colonic perforation. Colostomies may be temporary or permanent, depending on the indication for surgery and the clinical context.

1.2. Types & indications

There are several types of colostomies: end, loop, double barrel and end colostomy with mucous fistula (Fig. 1). An end colostomy is usually located in the left lower quadrant and is created in two main settings: (1) permanent, after abdominoperineal resection (APR) usually performed for very low rectal tumors (Fig. 2) and (2) temporary, after Hartmann's procedure, usually performed for diverticulitis.

A loop colostomy is usually constructed from the transverse colon and located in the upper abdominal wall. It is generally performed as a temporary procedure to protect a distal anastomosis or in acute colonic obstruction (Fig. 3). A loop of colon is exteriorized and brought to the anterior abdominal wall without transection. A horizontal incision is made in the anterior wall of the colon. This creates an afferent and efferent limb with the posterior wall of the colon still intact with a common stoma. This type of colostomy has the advantage of being technically easier to perform than other types, but does not completely divert the fecal stream.

A double barrel colostomy is created by transecting the colon and bringing each end up to the anterior abdominal wall as separate stomas adjacent to one another (Fig. 4). This more completely diverts the fecal stream compared with the loop colostomy. A single colostomy bag is used.

An end colostomy with mucous fistula is a type of double-barrel colostomy with two stomas not located immediately adjacent to one another. It is created by removing a segment of colon, usually transverse or descending colon, and attaching each end of remaining colon to a separate opening in the abdominal wall. The proximal limb of colon (functional stoma) is exteriorized on the right side of the abdomen and the distal limb (mucous fistula) is brought out to the skin in a site remote from the functional end colostomy. In the Hartmann's procedure, the distal limb is not exteriorized, but is closed off and dropped into the pelvis (Fig. 5).

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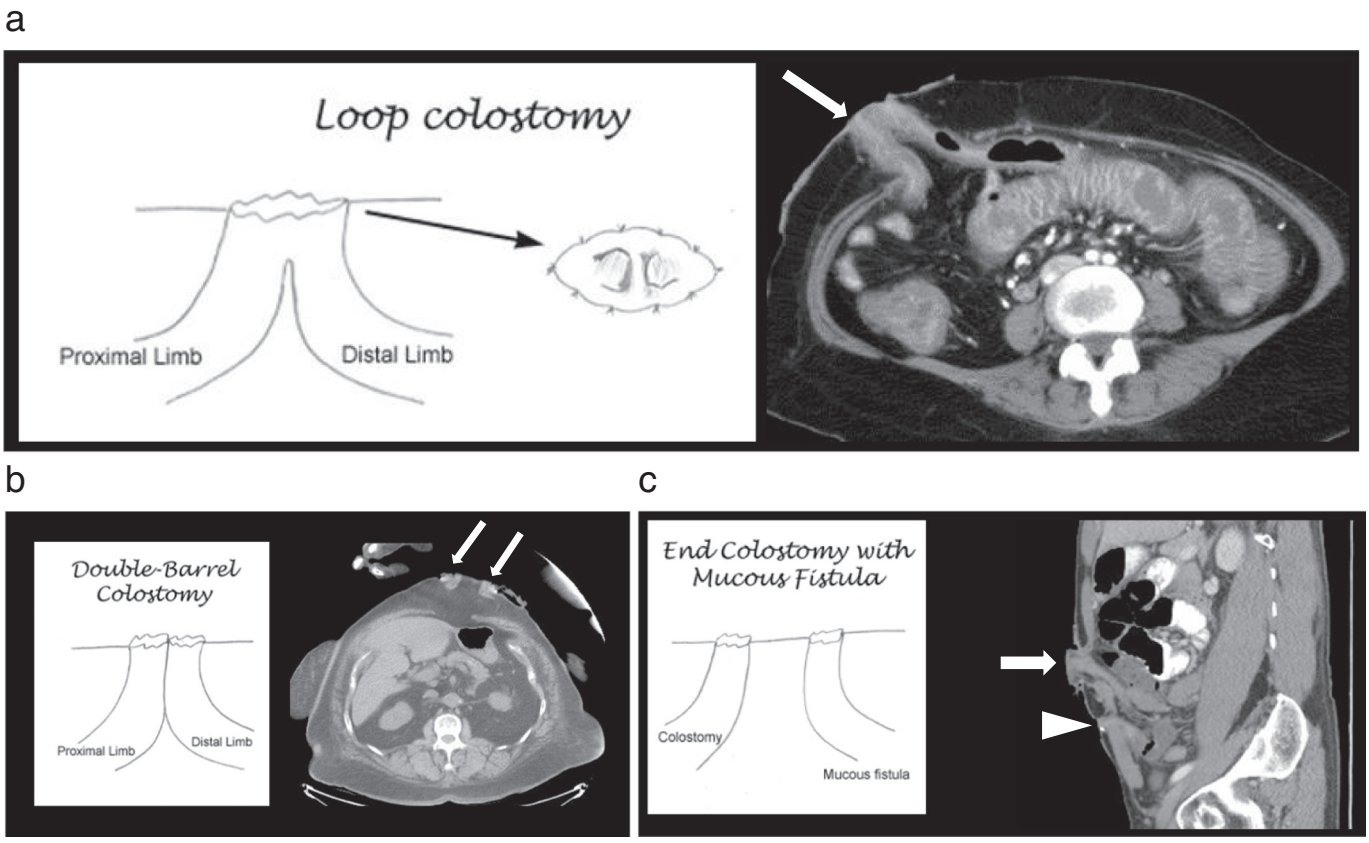

Fig. 1. Types of colostomies: a) loop colostomy: a loop of colon exteriorized without transection. Anterior wall of the colon and both limbs are open with a common stoma (arrow). b) Double barrel colostomy: both ends of bowel are brought to the skin surface as two separate stomas adjacent to each other (arrows). c) End colostomy with or without mucous fistula: after creation of the end colostomy (arrow), the disconnected distal end of the bowel is sewn off or is pulled through anterior abdominal wall to create a mucous fistula (arrowhead).

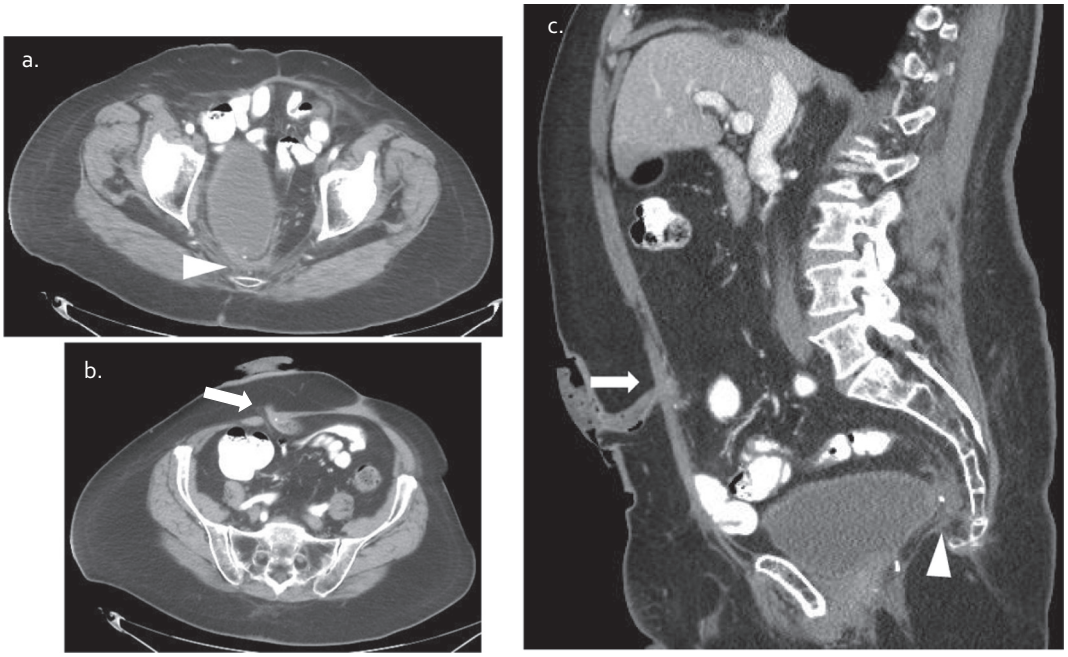

Fig. 2. End colostomy: axial (a, b) and sagittal (c) CT images in a patient who underwent abdominoperineal resection (APR) with end colostomy (arrow). Note the post surgical change in the pre-sacral space in place of the rectum (arrowhead).

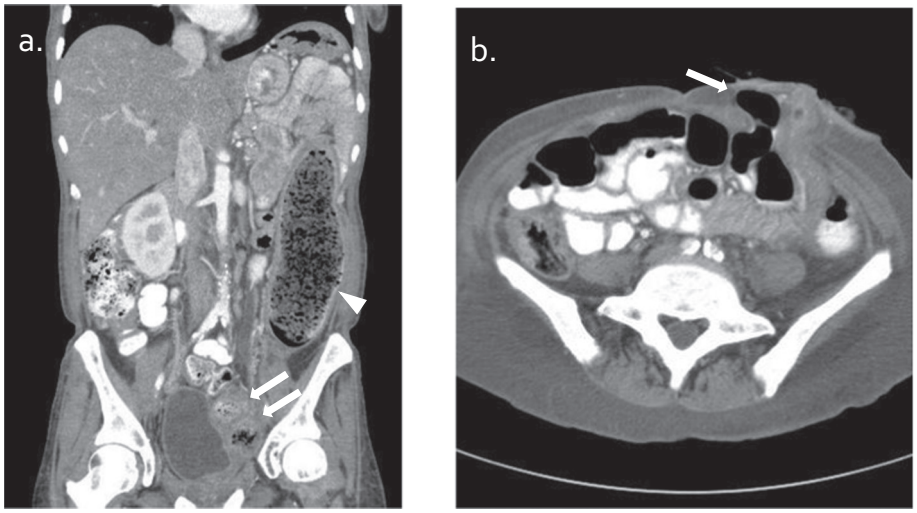

Fig. 3. Loop colostomy: coronal (a) and axial (b) CT images in a patient with large bowel obstruction. Patient underwent diverting loop colostomy. Note dilated colon (arrowhead) and stricture and mural thickening in the sigmoid (double arrow). Small bowel in a parastomal hernia is also seen (arrow).

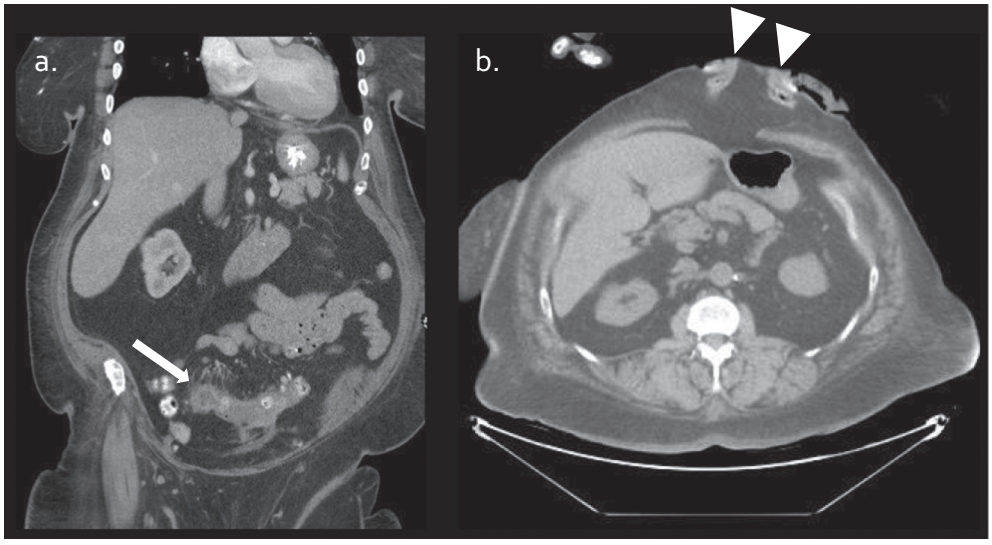

Fig. 4. Double barrel colostomy: coronal (a) and axial (b) CT images in 75 y old morbidly obese female who was not a surgical candidate for sigmoidectomy underwent a double barrel colostomy for repeated episodes of diverticulitis. Sigmoid thickening and a small abscess (arrow) are seen. Note the stomas are slightly separated from each other (arrowheads).

2. Radiographic technique of colostomy study

Prior to performing a colostomy study, correlation with surgical history and prior imaging can aid in planning and interpreting the examination. The patient should be advised to bring necessary materials to address colostomy needs for use after completion of the study. Colonic cleansing should be performed based on the institution's bowel preparation protocol, and tailored to the specific clinical question.

A scout radiograph of the abdomen should be obtained prior to the examination. It should be reviewed for surgical material, particularly anastomotic staple lines, and assessment of the bowel gas pattern. Residual contrast may interfere with the exam or be confused with a leak after additional contrast is introduced. Stomal prolapse may make cannulation of the stoma difficult. If a cutaneous fistula is suspected, a radio-opaque marker should be taped adjacent to the fistulous orifice.

Dilute water-soluble contrast is typically used in patients who are being evaluated for a potential anastomotic leak. Otherwise, barium could be utilized. A large volume of contrast is typically needed to fill the entire colon (500–700 cm^3), however the quantity of contrast needed will depend on the length of the remaining colon. The contrast bag is attached to translucent tubing which should also be filled with contrast, eliminating any residual air, and hung three feet above the table with the valve closed.

Dedicated ostomy appliances including self-fabricated devices may be used for cannulating the stoma. Digital exam with a gloved finger should initially be performed to help determine the orientation of the involved bowel and its distention and plan catheter angulation. The tip should be lubricated and gently placed into the stoma with the appliance taped well to the abdominal wall to avoid contrast leakage. The biggest challenge is creating a perfect seal on the abdominal wall in order to prevent contrast leakage. Guiding the patient to place one hand's fingers over the device to apply continuous pressure will help prevent leak. Although double contrast enema through the colostomy catheter has historically been performed, it has been largely replaced by colonoscopy or CT colonography via the ostomy.

Historically there were many catheters that utilized a balloon inflated inside the colostomy but these were reported to be associated with colonic perforation and their usage became controversial. In 1971, Land reported a self-fabricated catheter-nipple device where a soft rubber catheter is placed through an infant feeding nipple whose tip is cut off to leave an appropriate sized hole to accommodate the catheter [1]. In 1982, Pochaczevsky described a disposable colostomy device with a flexible catheter threaded through a plastic cone where the catheter is guided into the stomal orifice and the cone advanced for

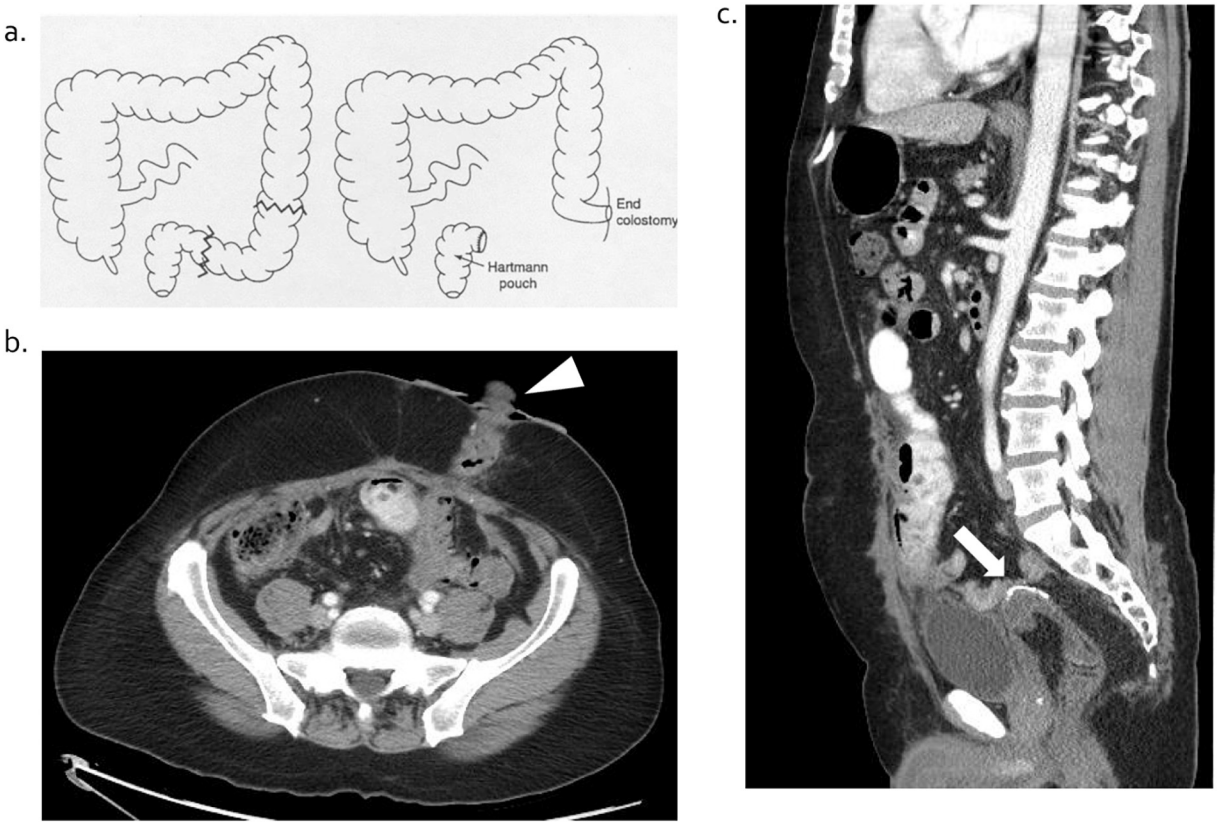

Fig. 5. Hartmann's procedure: schematic drawing (a), axial (b) and sagittal (c) CT images in a patient who had a Hartmann's procedure. Note the anorectal stump (arrow) and formation of an end colostomy (arrowhead).

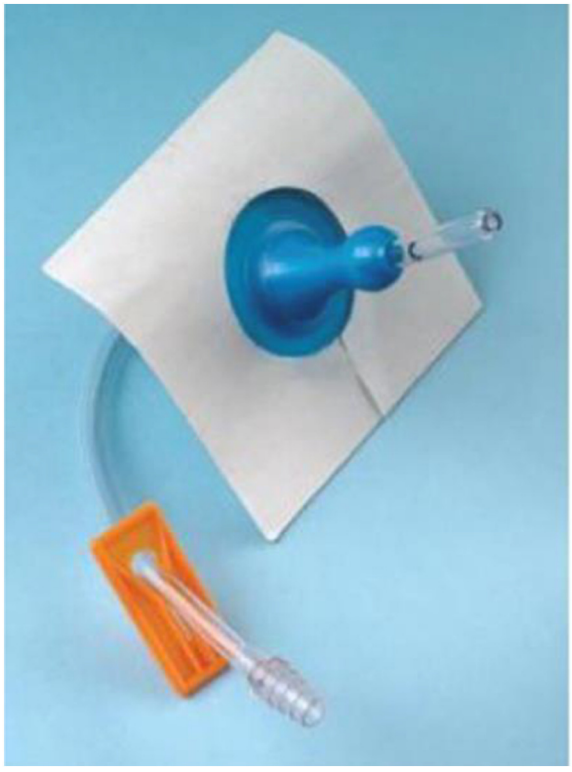

Fig. 6. Catheter-nipple device: used to cannulate stoma in a colostomy study.

external stomal obturation [2]. In 2003, Williams and Scott reported their own fabricated colostomy catheter assembled from a nonlatex retention cuff enema tip (Flexi-Cuff; E-Z-EM, Westbury, NY), a 22-French Foley catheter (Bardex; C.R. Bard, Covington, GA), a "Christmas-tree" connection adapter, and an insufflator (Cufflator; E-Z-EM). The technique of assembly is well-described and can be easily recreated by performing radiology staff. The retention cuff is inflated to provide an external cutaneous seal once the Foley catheter tip inserted into the stoma. The flexibility of the Foley catheter tip allows for easier stomal cannulation and the external retention balloon improves the external seal. This device also has advantages over the cone because of its minimal invasiveness and smooth contour [3]. In our department, we use a disposable nipple colostomy tip catheter (Flexi-Stome; E-Z-EM, Princeton, NJ) whose tip is stiffer than a Foley catheter (Fig. 6.).

Technique should be tailored to the clinical question. Generally the examination should start in the supine position. If obstruction is suspected near the colostomy site, imaging is best done starting in the lateral position. Contrast flow is initiated by opening the valve and the contrast bolus tracked with sequential fluoroscopic spots, taking extra spots if any abnormality is seen. The spots obtained will vary with the amount of residual colon present and any abnormality detected. Our typical protocol includes:

1. Follow the bolus as it enters the colon and oblique the patient as needed when a flexure is reached. If the contrast first enters the left colon, spot the left colon.
2. When contrast reaches the splenic flexure, turn the patient RPO and spot the splenic flexure.
3. Turn the patient supine to fill the transverse colon, taking a spot.
4. Turn the patient LPO and spot the hepatic flexure.
5. Turn the patient supine to fill the ascending colon and cecum.

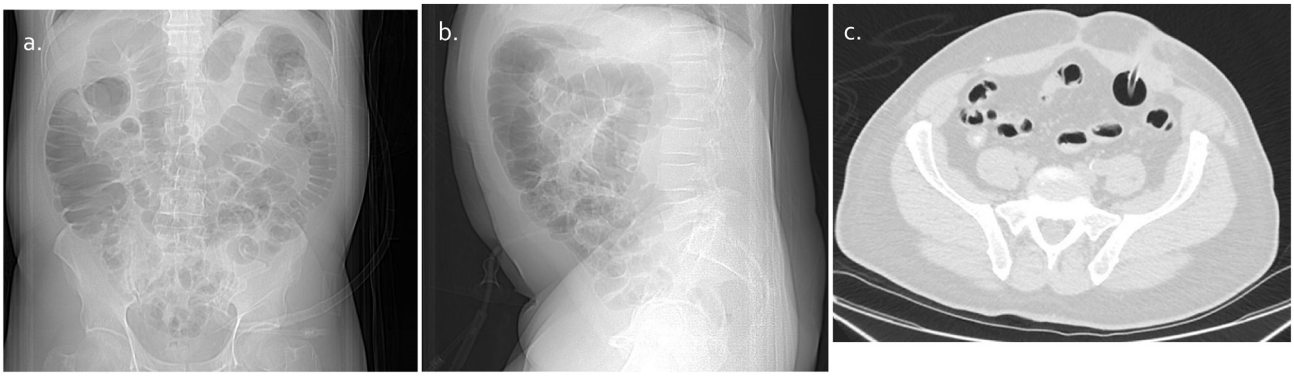

Fig. 7. CT colonography via colostomy: frontal (a) and lateral (b) scout and axial (c) images from CT colonography performed via colostomy for colon cancer screening.

The table can be turned 45° semi erect if necessary to aid right colonic filling. Spot the cecum in the position it best fills, either supine or LPO. If reflux into the terminal ileum, ileocecal valve, or the appendix is visualized, this confirms the cecum is filled, and contrast flow can be terminated to avoid flooding the distal small bowel with contrast.

Overhead films or, on more current RF units, high quality dezoomed spot films should be obtained in multiple projections tailored to the colonic anatomy, the clinical question, and any pathology identified. The contrast bottle should then be placed on the floor with the tube valve open to help drain the colon after the overhead films have been obtained. Post-evacuation films should be obtained as necessary. The catheter is then removed.

There is growing use of CT colonography (CTC) in colostomy patients in more recent years, but its universal use is still early in practice (Fig. 7). In the largest published series, Lee et al. reported successful CTC through a sigmoid stoma in 18 patients who had undergone sigmoid colostomy after abdominoperineal resection. After digital exam of the colostomy site by the radiologist to assess catheter distension and aid catheter direction, they placed a standard CTC catheter with a retention balloon (PROTOCO$_2$L) into the stoma. When the catheter was advanced several centimeters past the stoma without resistance to ensure that a short colonic segment and adjacent tissue would be present between the balloon and the stoma, the retention balloon was inflated a variable amount ranging from 15 to 25 mL depending on the findings at digital examination and degree of catheter pushback during colonic insufflation. Two patients had minor mucosal tearing near the stoma manifested as spontaneously resolving local bleeding after catheter removal [4]. With similar technique and standard CTC catheter, Ito et al. reported successful CTC in a patient after sigmoid colostomy and abdominoperineal resection who failed complete stomal colonoscopy due to sub-occlusive transverse colonic tumor [5]. There is one report of colonic perforation in a patient during CTC via the sigmoid colostomy in a patient with abdominoperineal resection, treated with stomal revision. After resistance to stomal cannulation with a 24 French Foley catheter, conversion was made to a 16 French catheter that was inflated with 10 mL of air. After colonic insufflation with 2 L of room air, free air was detected on axial images with the Foley balloon located outside the bowel wall [6].

3. Colostomy - complications

The incidence of ostomy complications ranges from 13 to 69% with one of the largest series reporting 34% [7,8]. Early complications, defined as those occurring within the first post-operative month, are seen in up to 30.9% of patients, and include infection, ischemia, mucocutaneous separation, retraction of the stoma, and small bowel obstruction. Rarely, with a Hartmann procedure, the distal limb of the colostomy is brought out to the skin in error, and the proximal limb is closed off (Table 1) [9,10]. Late complications, occurring after the first month, are seen in 6% of patients. These include parastomal hernia, skin complications, stenosis, prolapse, lymphoid hyperplasia, and varices (Table 1). The highest incidence of complications occurs with descending end colostomy and the lowest with end transverse colostomies [11].

Table 1
Colostomy complications.

Early complications (< 30 days)	Late complications (> 30 days)
• Infection • Leak • Abscess • Ischemia • Mucocutaneous separation • Retraction • Small bowel obstruction • Inadvertent closure of the proximal limb with distal limb brought to skin post Hartmann procedure	• Parastomal hernia • Skin complications • Stenosis • Prolapse • Lymphoid hyperplasia • Stomal varices • Diversion colitis

Table 2
Risk factors associated with colostomy complications.

Risk factors for complications
• Advanced age • Obesity • Presence of inflammatory bowel disease • Malnutrition • Operating service (colorectal versus general or other surgical specialty) • Stoma type and configuration • Lack of pre-operative marking by an enterostomal nurse or therapist

Risk factors for the development of colostomy complications include older age, obesity, chronically increased intraabdominal pressure such as a chronic cough, presence of other abdominal wall hernias, wound sepsis, chronic obstructive pulmonary disease, malnutrition, smoking, steroid use, diabetes, cancer, and inflammatory bowel disease [8,12] (Table 2).

Factors that may increase the risk of parastomal hernia and other complications include emergency rather than elective surgery, surgical technique, and diameter of the trephine (abdominal wall defect). The risk of parastomal herniation is increased with a larger trephine, stomal placement outside of the rectus muscle, and a greater age of the colostomy [8].

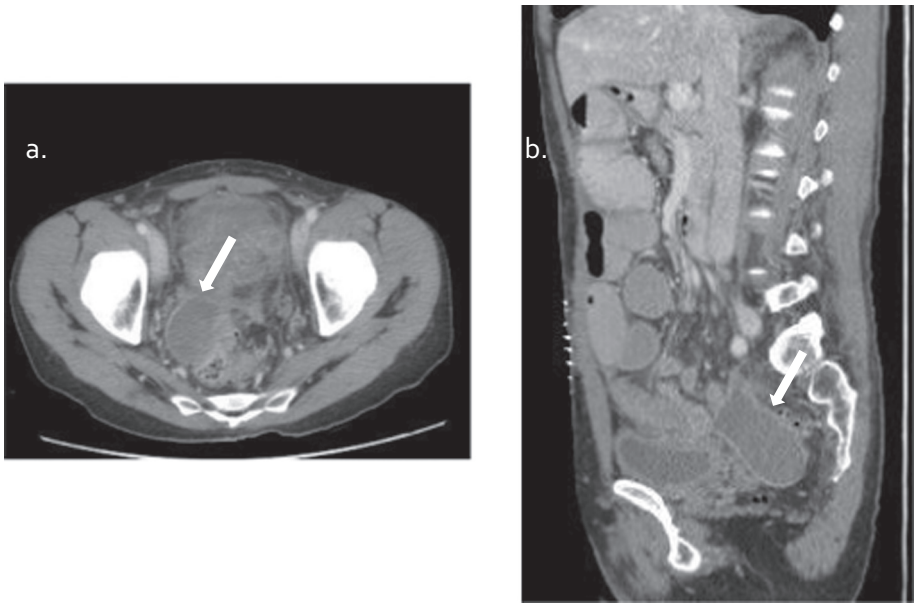

Fig. 8. Intraperitoneal abscess: axial (a) and sagittal (b) CT images performed after colostomy demonstrate a well-circumscribed hypodense fluid collection with an enhancing rim consistent with deep pelvic abscess (arrow).

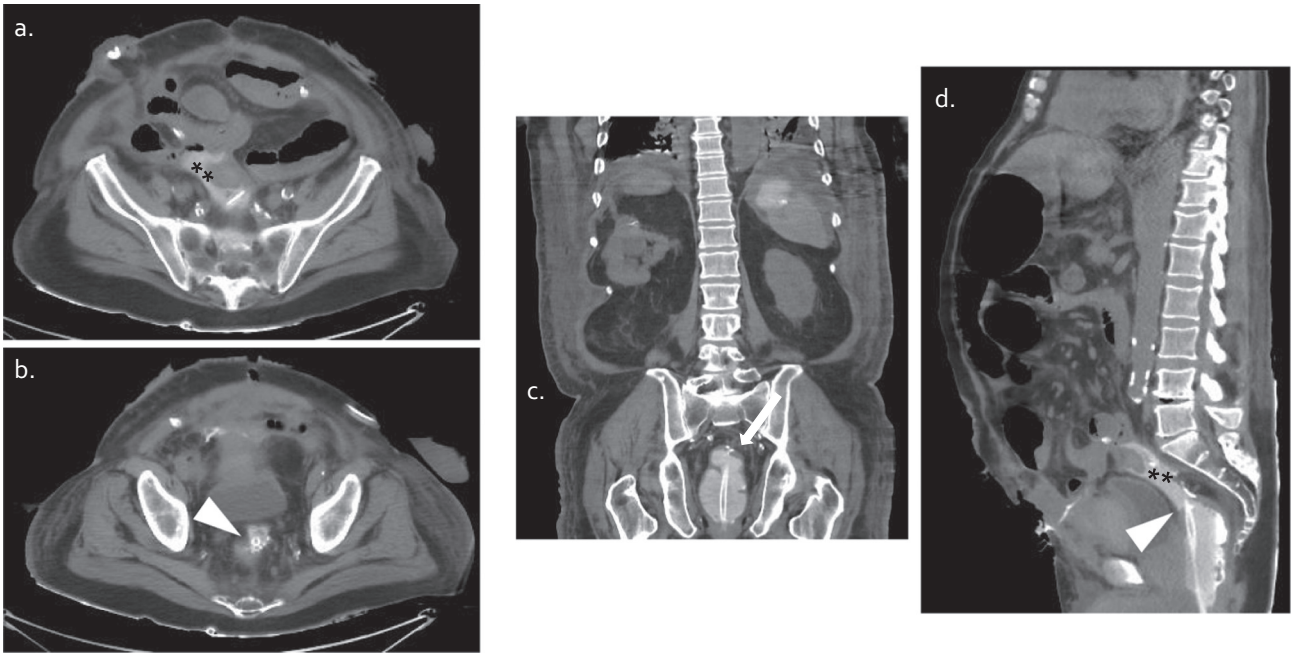

Fig. 9. Stump leak: axial (a, b), coronal (c), and sagittal (d) CT images in a patient after undergoing Hartmann's procedure. Note the rectal stump (arrow). Rectal contrast administered via rectal tube is seen extravasating from the superior aspect of the stump (arrowhead) with a collection seen in the pelvis (stars).

3.1. Early complications

3.1.1. Wound complications

Patients who have undergone major abdominal surgery are at risk for wound infection, with the incidence ranging from 5 to 10% [13]. Risk factors include obesity, steroid use, inflammatory bowel disease and other chronic medical conditions. On CT and sonography, early findings include accumulation of fluid with or without air in the wound and adjacent tissues. It is important to routinely inspect the subcutaneous tissues at the incision site, looking for separation of the fascial layers, infiltration of the fat, proliferation of gas bubbles and potential peritoneal or extraperitoneal involvement [14]. Treatment may include broad-spectrum antibiotics and incision or drainage of localized fluid collections suspected to be infected.

3.1.2. Intraperitoneal abscess

Abscess remains the most common cause of morbidity following colorectal surgery and can potentially lead to sepsis [15]. It occurs in up to 40% of bowel surgeries. The most common causes include wound infection, anastomotic leak, fistula formation and contamination during surgery. Multidetector CT has both high sensitivity and specificity for the detection of intra-abdominal abscess [13]. A well-circumscribed hypodense fluid collection with a variably enhancing rim is typically seen with or without internal septa or loculations (Fig. 8). Intracavitary gas is not uncommonly seen. Infiltration of the surrounding intraperitoneal fat is typically present. Additional findings include

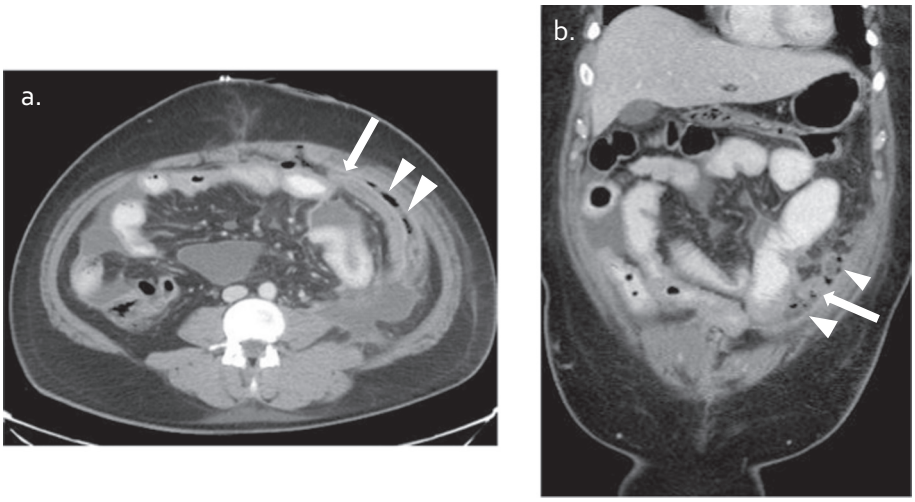

Fig. 10. Stomal retraction: axial (a) and coronal (b) CT images in 29 year old male who presented with large bowel obstruction due to diverticulitis and underwent Hartmann procedure. CT demonstrates retraction of the colostomy into the peritoneal cavity (distal end of colostomy - arrow) with foci of free air (arrowheads).

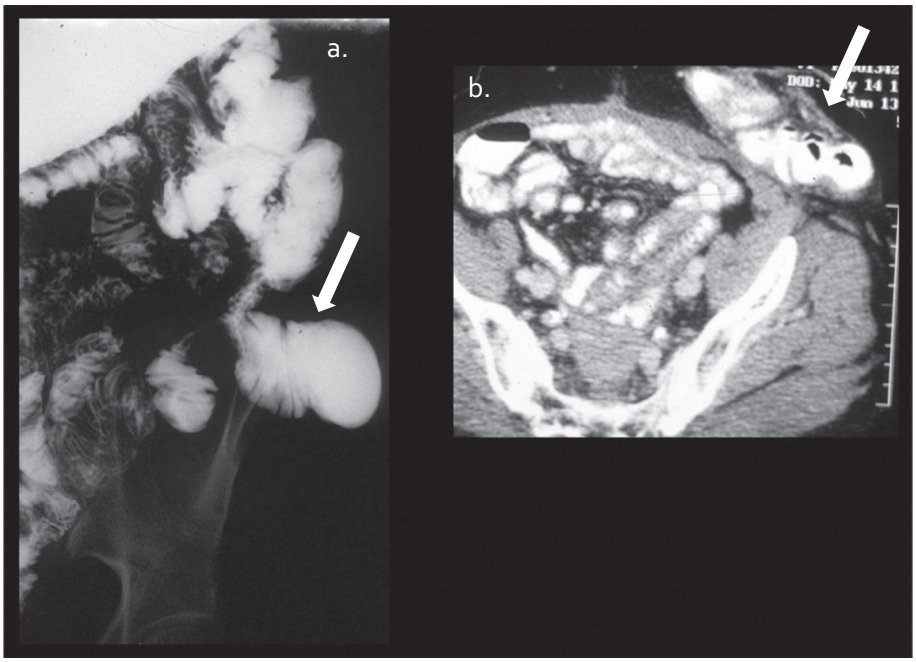

Fig. 11. Parastomal hernia: images from small bowel series (a) and axial CT scan with oral and IV contrast (b) demonstrates parastomal hernia containing non-obstructed small bowel (arrow).

enhancement and loss of fascial and peritoneal planes. Standard radiologic reporting should include the location and orthogonal measurements of any suspected abscess cavity. The radiologist can also indicate whether the collection is amenable to CT guided percutaneous drainage based on its location. Broad spectrum antibiotics and image guided percutaneous drainage are the standards of care with reoperation performed in select cases.

3.1.3. Leak

Anastomotic leak from the blind-ending stump is a rare but potentially life-threatening complication of Hartmann's procedure. It may be intraperitoneal or extraperitoneal, and may or may not be accompanied by a fluid collection (Fig. 9). The incidence of leak from a Hartmann's pouch ranges from 2 to 9%. Fluoroscopic single contrast enema or CT scan with rectal contrast can be performed to assess the integrity of the stump before reversal of the colostomy in asymptomatic patients, or in symptomatic patients with clinical signs of a leak such as fever, abdominal pain, or leukocytosis. CT scan is often performed to assess for a concomitant abscess. Water soluble contrast should be used [16].

3.1.4. Bowel ischemia

Signs of bowel ischemia involving the stomal segment are often evident within 24 h after stomal creation. The incidence of early stomal necrosis has been reported in up to 17% of patients [10]. The cause is often inadequate arterial supply due to improperly divided vascular arcades surrounding the stoma [17]. Excessive tension and venous thrombosis may also lead to ischemia. On CT scan, early findings of ischemic necrosis include thickening of the bowel wall, peristomal fat stranding and absent or hypoenhancement of the involved bowel wall.

3.1.5. Retraction

Stoma retraction is most often an acute complication, but it may be seen with chronic stomas (Fig. 10). It occurs in up to 8% of colostomies [18,19] and is more commonly seen in obese patients due to the

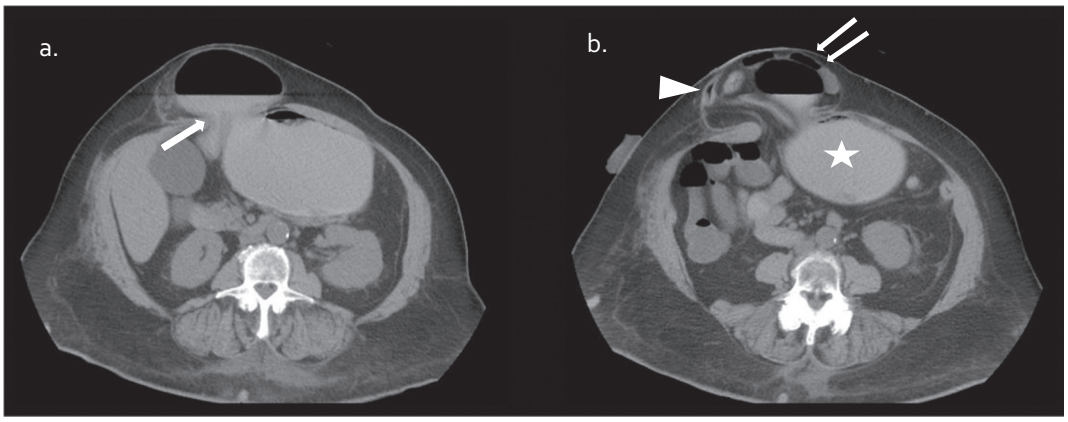

Fig. 12. Parastomal hernia with obstruction: axial contrast enhanced CT with incarcerated stomach in a parastomal hernia. Images demonstrate point of obstruction (arrow), distended stomach (star), herniated small bowel (double arrow), and colostomy limb (arrowhead).

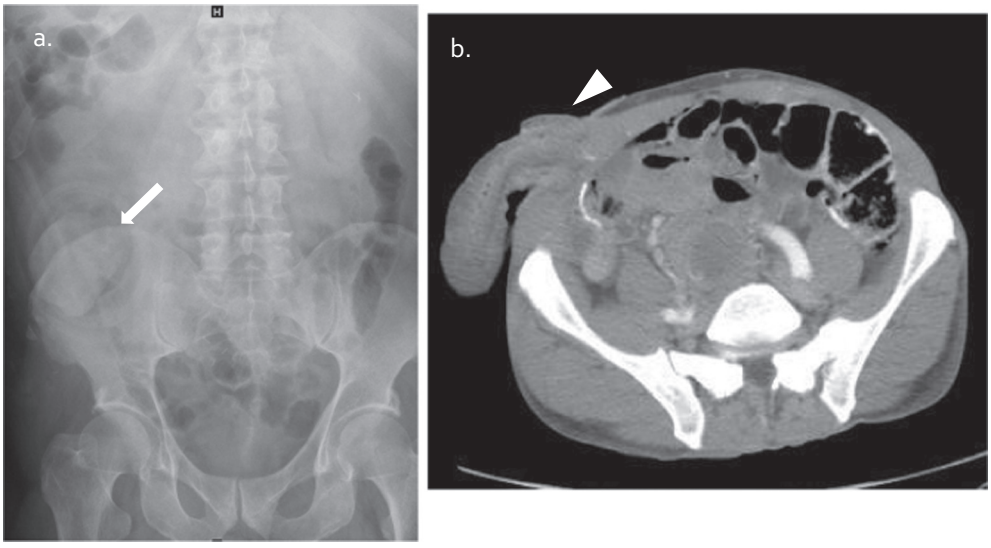

Fig. 13. Stomal prolapse: frontal abdominal radiograph (a) demonstrates stomal prolapse presenting as a soft tissue mass surrounded by air at the colostomy site (arrow). Prolapse is easily identified on axial CT (b) (arrowhead).

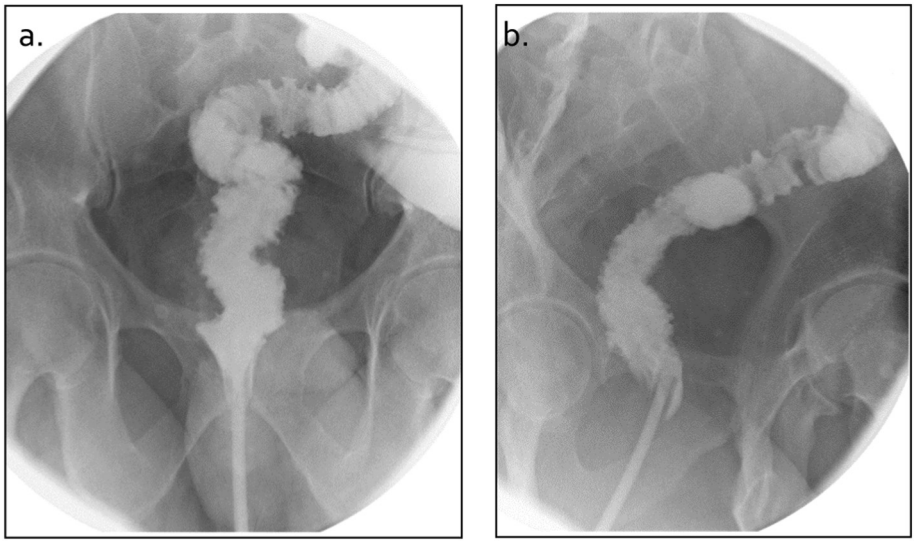

Fig. 14. Diversion colitis: AP (a) and oblique (b) fluoroscopic images from a single contrast enema demonstrate spiculated mucosa due to colonic mural thickening from diversion colitis in patient with colostomy.

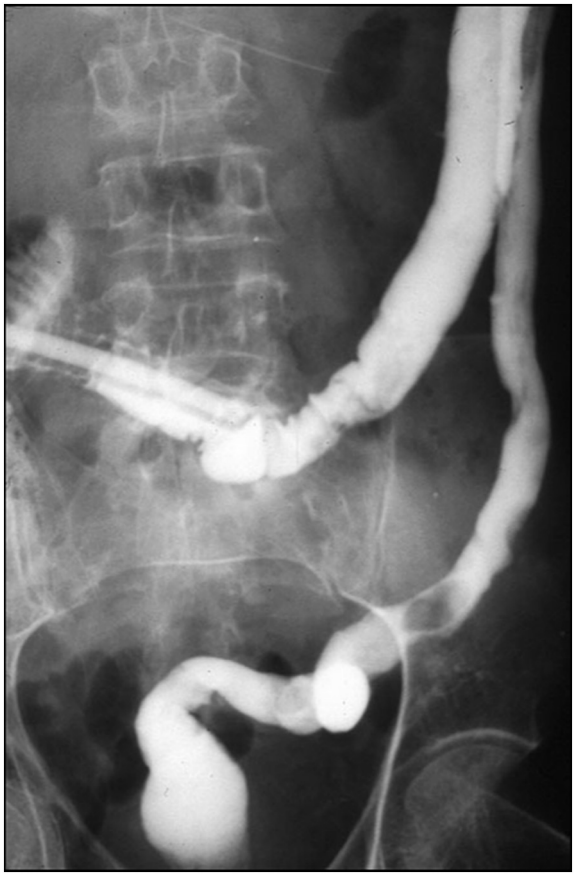

Fig. 15. Disuse microcolon: AP fluoroscopic image from a colostomy study demonstrates small colonic caliber and lack of haustra consistent with disuse microcolon.

thickness of the abdominal wall making the stoma creation more difficult [20]. The two most common causes are weight gain after stomal creation and short length of exteriorized bowel. Prior to stomal revision, recurrent Crohn's disease, malignancy and ischemia must be excluded as potential causes of retraction.

3.1.6. Small bowel obstruction/ileus

While patients with colostomies may have bowel obstruction due to adhesions from prior surgery, bowel obstruction may develop at the level of the ostomy itself. Causes of bowel obstruction at the level of the stoma include stricture, stenosis, parastomal hernia, recurrent Crohn's disease or malignancy. Internal hernias and volvulus can also result in bowel obstruction. In the early postoperative period, small bowel obstruction may be successfully treated conservatively by decompression with an enteric tube. However, late postoperative obstructions often require surgery [21].

Postoperative ileus is a common cause of bowel dilation in the immediate postoperative period after colon surgery. Patients often will have symptoms resembling colon obstruction. The condition usually resolves within 48 h. If symptoms persist for > 2 to 5 days after surgery, obstruction or other causes must be excluded [22].

Abdominal radiographs are often nonspecific revealing dilated bowel with air/fluid levels, which can be seen in both ileus and small bowel obstruction. CT scan is, therefore, relied upon to confirm bowel obstruction. It identifies the transition point from dilated to collapsed loops of bowel in up to 95% of cases [23]. Furthermore, CT is often able to distinguish between ileus and early ischemic changes in order to provide appropriate medical or surgical treatment [22,24]. In the setting of post-operative ileus, a transition point will not be identified, and both small and large bowel may be distended.

3.2. Late complications

3.2.1. Parastomal hernia

Parastomal hernia is the most common late complication of colostomy and occurs due to decreased strength of the surrounding abdominal wall fascia [25]. The incidence of parastomal hernias is variable with one study reporting an incidence of up to 38% at five years [26]. Parastomal hernias usually develop within 2 years of surgery, but some may not appear until 20 years later [27]. They are usually asymptomatic, but can cause pain, abdominal wall bulge, poor stoma fitting, bowel obstruction, and changes in the fecal stream [8]. Mesh placement at the time of stoma placement can reduce the incidence of hernia formation. If the parastomal hernia is large and symptomatic, repair may be performed by relocating the stoma with a fascial or mesh repair, but recurrence is high [7].

There are 4 types of parastomal hernias: (1) interstitial, which is located within the layers of the abdominal wall; (2) subcutaneous,

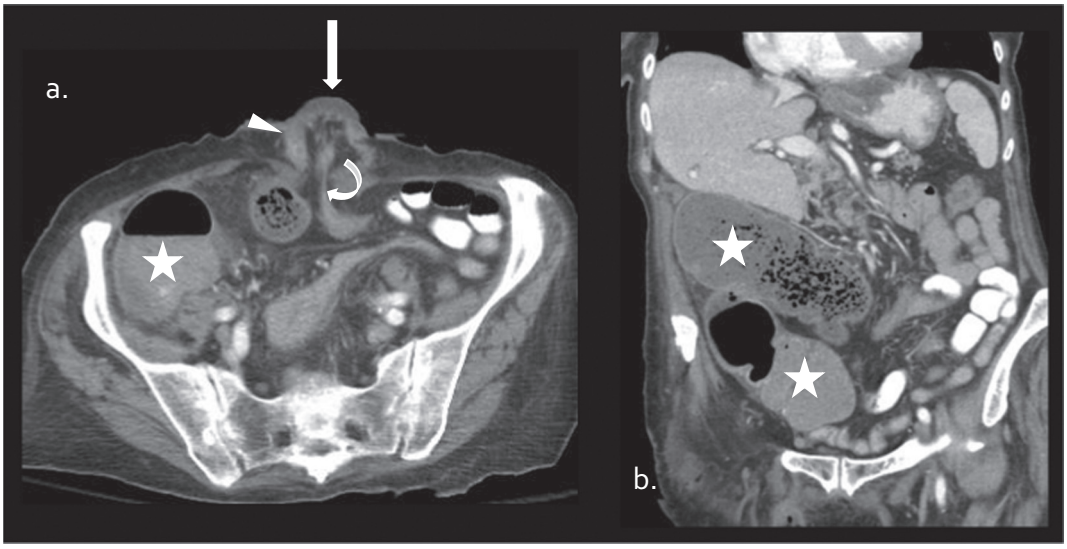

Fig. 16. Stomal stenosis: axial (a) and coronal (b) images from a contrast enhanced CT scan demonstrates obstructed loop colostomy due to stomal stenosis. Note loop colostomy (arrow), proximal limb (arrowhead), distal limb (curved arrow), and obstructed right colon (star).

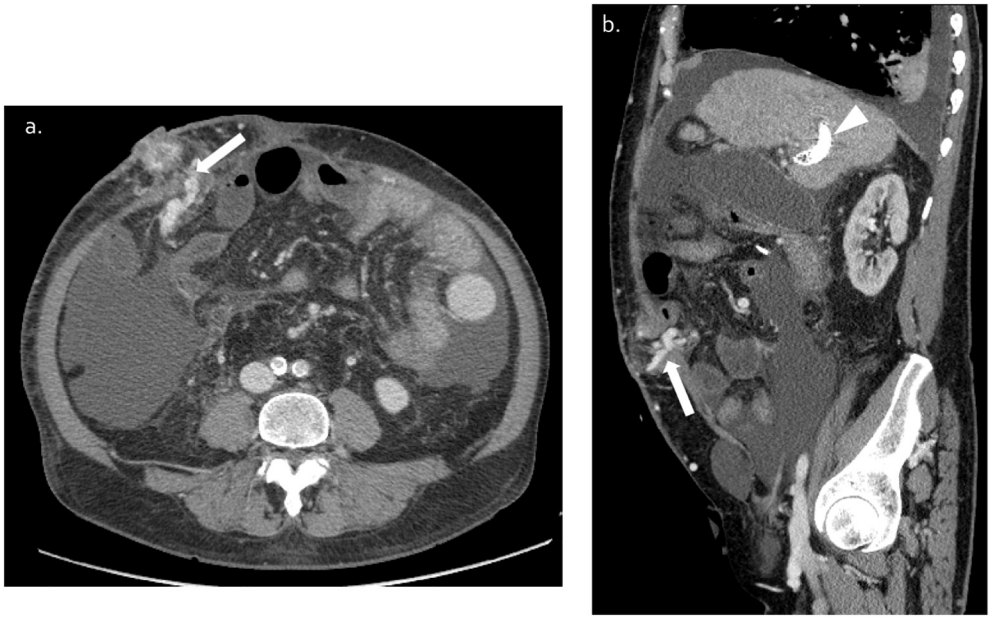

Fig. 17. Peristomal varices: axial (a) and sagittal (b) images from a contrast enhanced CT scan demonstrate large enhancing varices (arrow) adjacent to the stoma. Note the ascites and TIPS stent (arrowhead) in this patient with cirrhosis and portal hypertension.

which is located in the subcutaneous fat and is the most common; (3) intra-stomal, where the hernia extends into the spout of the stoma; and (4) peristomal, where the hernia is adjacent to the stomal bowel loop [28].

While parastomal hernias are often diagnosed clinically, CT greatly aids their detection, especially in obese patients (Fig. 11). Parastomal hernias are better seen on CT scan than fluoroscopy and can be overlooked on fluoroscopic exam alone. The hernia may contain colon, small bowel and/or omentum and may be in the subcutaneous tissues or external to the abdominal wall adjacent to the stoma. Routine CT scan does not exclude all parastomal hernias as some may only become evident when the patient is erect or performing a Valsalva maneuver. If the provided clinical indication states suspected parastomal hernia, CT scan should be performed during Valsalva maneuver as it has been shown to improve detection of anterior abdominal wall hernias compared with routine exam [29]. Other studies have shown that CT scan in the prone position and 3-dimensional intra-stomal ultrasound are helpful in identifying suspected but radiologically occult parastomal hernias [30,31]. Radiologic classification systems exist for parastomal hernias which depend on hernia content, relationship between the hernia sac and bowel forming stoma, and sac size, but these have not been widely adopted in clinical practice. Clinically significant findings that should be reported on CT include presence or absence of a hernia, hernia contents, and growth of the sac since the last examination and/or bowel obstruction (Fig. 12).

3.2.2. Stomal prolapse

Stomal prolapse occurs when an excessive length of bowel protrudes into the stoma opening and is often associated with a parastomal hernia. It is caused by an excessively large opening in the abdominal wall or inadequate bowel fixation [8]. The incidence is 7–26%, is most common with a loop transverse colostomy, and is usually a late complication [7]. Stomal prolapse is usually clinically silent but may present with pain, abdominal wall bulging, and/or an ill-fitting appliance. It may rarely lead to incarceration and strangulation. Prolonged exposure of the mucosa can result in ulceration and bleeding [8].

There are 2 types of prolapse: (1) fixed, which is permanent; and (2) sliding, which is intermittent, and becomes more obvious during the Valsalva maneuver [8].

Prolapse can occasionally be seen on a plain abdominal radiograph as a soft tissue mass outlined by air at the site of the stoma. It is easily detected on CT scan (Fig. 13).

3.2.3. Diversion colitis

Diversion colitis occurs in nearly all patients in which the colonic segment is diverted from the fecal stream [21,32] (Fig. 14). Although the majority of the patients are asymptomatic, symptoms may include crampy abdominal pain, mucous discharge, tenesmus and/or hematochezia [33]. The etiology of diversion colitis is not well understood with overgrowth of normal bacterial flora leading to nutritional deficiencies theorized [27,33]. A nodular mucosal pattern, pseudopolyposis and non-distensibility (disuse microcolon) may be seen on contrast enema [34] (Fig. 15). CT scan findings include colonic mural thickening, poor colonic distension and bowel wall hyperenhancement. Patients with long standing diversion colitis are at a higher risk of developing colon cancer [35]. The colitis resolves once the colostomy is reversed and the fecal stream is reconstituted.

3.2.4. Stenosis

The main cause of stomal stenosis is ischemia. However, local infections, stomal retraction and an inadequate skin opening may also lead to stenosis (Fig. 16). Stomal stenosis may develop immediately after surgery or months later. The reported incidence varies from 2 to 14% [36,37]. Malignancy and recurrent Crohn's disease must be excluded as a cause. The majority of cases can be treated conservatively by altering the diet as long as there are no major cutaneous complications [25].

3.2.5. Stomal bleeding/peristomal varices

Patients presenting with stomal bleeding need to be evaluated and managed in the same way as any patient with gastrointestinal bleeding. Local trauma is the most common cause and may be treated by applying pressure. Granulation tissue is another common cause of stomal bleeding. Portal hypertension can also lead to a stomal bleed and, although uncommon, stomas are a site for the development of varices in patients with portal hypertension (Fig. 17). Collaterals between the mucosal vessels and peristomal cutaneous vessels result in a portosystemic connection [25]. Bleeding from these varices may be recurrent, painless and profuse [38]. Patients with a variceal bleed at the level of the stoma must be evaluated for portal hypertension and associated

esophageal varices.

4. Conclusion

Colostomies are often an integral part of colorectal surgery and are commonly seen on imaging. It is important for the radiologist to be able to differentiate the types of ostomies, and know the indications and proper radiological techniques used in their evaluation. Furthermore, fluoroscopy and multi-detector CT scan have a vital role in diagnosing ostomy complications and aid the surgeons in timely and appropriate treatment.

Declarations of interest

None.

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