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Leak, fistula, sepsis, sinus, portal vein thrombosis

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ABSTRACT

The creation of an ileal pelvic pouch is a complex procedure. While many perioperative complications are possible, surgery specific complications may include a pouch leak, fistula, abscess with sepsis, anastomotic sinus, and portal vein thrombosis. In this chapter, each of these are individually discussed along with evaluation and treatment options.

Pouch leak

A leak after an ileal-pouch creation can occur from the ileal pouch-anal anastomosis (IPAA), pouch body or tip of the J-pouch. A pouch leak can be acute resulting in severe pelvic sepsis or have a more indolent course presenting with persistent ileus or failure to meet expected recovery milestones after surgery, with development of abdominopelvic abscess.[1,2] In acute IPAA leak, surgical intervention should be preceded by immediate fluid resuscitation and administration of intravenous broad-spectrum antibiotics. Unstable patients require emergent exploration with peritoneal washout and diverting loop ileostomy when a pouch is not defunctioned. In some cases, conversion of a loop to an end ileostomy may be required in order to completely divert the pouch when patients who are diverted are ill. For the patient with an abdominopelvic abscess, percutaneous drainage (if amenable) along with broad-spectrum IV antibiotic administration allows for control of sepsis and may minimize the long-term consequences to the pouch.[3] Selecting trans-anastomotic versus percutaneous abscess drainage is a matter of debate with some concern for development of an extrasphincteric fistula with percutaneous (specifically transgluteal) drainage. When a break in anastomotic integrity is demonstrated as being coexistent with an abscess, a trans-anal trans-anastomotic drain is preferable. In this instance, examination under anesthesia with placement of an appropriately sized Pezzer (mushroom) catheter into the anastomotic defect is performed to (1) control leakage and (2) with the expectation over time that the cavity will fibrose, decrease in size and either completely resolve or form a sinus tract which can be dealt with by other means (see Pouch Sinus section). When the IPAA is intact, percutaneous CT guided drainage (either transabdominal or transgluteal) may be preferable and this strategy allows for prompt drainage of the abscess with minimal risk of extrasphincteric fistula formation.[4]

The tip of the J pouch (open end of the terminal ileum) is also susceptible to leakage. At the time of creation of the pouch, careful attention to the closure of the tip of the J is essential. The “tip of the J” is usually closed with a horizontally placed linear stapler taking care not to compromise the blood supply and the staple line may be reinforced with a running polyglactin suture. A leak from the tip of the J is difficult to detect as manifestations are variable and the course is often indolent. Symptoms and the presentation are subtle and variable. Diagnostic studies such as pouchoscopy, gastrografin enema, CT scan, and MRI may not accurately diagnose or detect the site of the leak. Endoscopy may occasionally detect a leak from the blind limb or an imaging study may demonstrate contrast leak from the tip of the J but this is not consistent.[5] Thus, a high degree of suspicion is required for its diagnosis. A tip of the J leak may also be associated with a leak from the pouch body or IPAA itself. Salvage surgery is often possible by resecting the tip of the J if redundant or a stapled or suture repair of the defect, pouch repair, pouch revision or pouch resection with redo IPAA with or without a proximal ostomy is sometimes required.[5] Salvage surgery is associated with a high rate of pouch survival and good long-term functional outcomes and quality of life.[5]

Fistula

Fistula associated with the pouch can be a pouch-vaginal fistula (PVF) or a pouch-perineal fistula. Enteric contents or flatus may pass through the vagina or perineum in addition to other symptoms such as perineal discomfort, irritation, and incontinence. PVF can result from (1) technical error during pouch creation whereby a portion of the posterior vaginal wall is incorporated into the EEA stapler, (2) IPAA leak

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with pelvic sepsis, or (3) postoperative diagnosis of Crohn's disease of the pouch.[6,7] Pouch-perineal fistula invariably arises as a result of Crohn's disease or less commonly cryptoglandular sepsis[8] although septic manifestations related to pouch leak can also present similarly.

Patients with PVF may present with stool per vagina, pelvic pressure or recurrent urinary tract infections. Assessment is preferably performed under anesthesia during which vaginoscopy and pouchoscopy can be performed for both the identification of the fistula as well as determination of the location, number, nature and size of the fistula(e) together with an assessment of the physical state of the pouch, anal canal and vagina. The vagina can be filled with warm water or saline while insufflating the pouch to assess for the presence of air bubbles in the vagina or injection of methylene blue solution into the pouch with insertion of a tampon into the vagina to assess for blue staining to confirm presence of a fistula. Imaging studies, such as a water-soluble contrast (gastrografin) study via the vagina (vaginogram) or pouch (pouchogram), or a magnetic resonance imaging (MRI) study of the pelvis may also help delineate the fistula tract and the anatomy of the pouch. The internal opening is commonly located at the ileal pouch anal anastomosis or in the anal transition zone, but may also arise at the dentate line as a result of cryptoglandular sepsis.[8]

Any fistula with evidence of ongoing sepsis, active inflammation, induration, an abscess cavity, or drainage will benefit from placement of a seton before attempt at repair. The seton facilitates drainage of any adjoining abscess cavity or infection, which may allow resolution of the infection and normalization of the tissues for a more feasible future surgical revision. Once the sepsis has resolved, options include leaving the seton in for a prolonged time or attempting definitive repair. In cases where Crohn's disease has been diagnosed, medical treatment with antibiotics or biologics may be used first to reduce inflammation and initiate healing before consideration of definitive repair or in some cases simple removal of the seton while maintaining the patient on long-term biologics may successfully close the fistula.

Management depends on the level of the fistula, the height of the ileal pouch anal anastomosis, the amount of pelvic scar tissue, and previous treatments. Surgical options are divided into abdominal and local perineal procedures. In general, abdominal salvage is achieved in 80% and perineal salvage in from 50% to 60% of cases.[9] Local procedures may be considered for short, low tracts with healthy surrounding tissue and no inflammation (“simple PVF”). Local approaches should also be considered for fistula arising from an ileoanal anastomosis, those within the anal canal, or just above the sphincters, as there may not be enough distal anal canal length to be clear of the fistula with an abdominal advancement of the anastomosis. Local procedures include mucosal advancement flap through a transanal or transvaginal approach, perineal pouch advancement, fibrin glue, collagen fistula plugs and ligation of intersphincteric fistula tract (LIFT). There is no conclusive evidence that success of local perineal procedures is enhanced by use of a covering loop ileostomy. PVF after IPAA is indolent and may persist after repairs. Although there is a high risk for repeated procedures and pouch failure for patients with a PVF, up to 85% of low PVF can be healed using these local approaches.[10] For higher PVF, combined abdominoperineal repairs have been associated with a significantly higher success rate than local perineal repairs, but only 50% of patients had successful healing with no recurrence; 21% eventually required pouch excision.[10] In general, redo ileal pouch construction has the best outcomes, with an overall pouch retention rate of 40%.[11] Despite the revision or salvage procedure used, a postoperative delayed diagnosis of Crohn's disease is associated with poor outcomes and a greater risk of pouch failure.[11]

Pouch sepsis

Pelvic sepsis related to pouch surgery can be defined as an abdominopelvic or perianal infectious process within 3 months of IPAA creation or within 3 months of defunctioning ileostomy reversal.[12] Depending on the manifestations and severity of the infection, this can be a significant complication associated with worse functional outcomes, diminished quality of life and, potentially, pouch failure.[13] Pelvic sepsis occurs between 3% and 25% of cases and accounts for at least half of all pouch failures, impacts functional outcomes and success of pouch salvage and leads to a substantial rate of pouch excision.[12,14,15] Detection of pelvic sepsis can be by clinical, radiologic, or operative means and usually presents with fever, leukocytosis, elevated C-reactive protein levels, tachycardia, pelvic or lower back pain, and non-specific postoperative ileus or failure to thrive. Pelvic sepsis may occur in conjunction with or separate from an anastomotic dehiscence. In the acute setting, pelvic sepsis may be overwhelming and resuscitation with IV fluids and antibiotics are immediately required. In hemodynamic instability emergent laparotomy and peritoneal washout with decontamination of the leak is essential and may require pouch excision or fecal diversion if an ileostomy is not present. Diagnosis can be helped with a CT scan of the abdomen and pelvis using oral, intravenous and rectal contrast to identify a peri-pouch abscess and its communication with any anastomotic leak. The timing of pelvic sepsis has an association with its etiology.[16] In general, septic complications that occur within 1 year of pouch creation or closure of a defunctioning ostomy are likely to be due to perioperative anastomotic or pelvic infective complications. Pelvic sepsis occurring more than 1 year after pouch creation instead increases the suspicion for Crohn's disease. The location of the septic source has an association with its clinical course. A classification system for septic complications by pouch levels has been described (level I: the upper and middle part of the pouch and potential blind limb; level II: rectal cuff; level III: pouch-anal anastomosis), with the risk of pouch failure significantly higher with complications in levels I or III.[17]

Pouch sinus

A pouch sinus is a presacral blind-ending tract arising from the area of the pouch-anal anastomosis that usually results from an anastomotic leak.[18] This complication occurs in 2%–8% of patients after an IPAA procedure.[19,20] A diagnosis can be made by endoscopy, gastrografin enema, or an exam under anesthesia, and should be confirmed by additional diagnostic modalities such as pelvic MRI. The pouch sinus may be of variable size, present as a narrow or wide-necked sac, and be incidentally detected on imaging studies or be symptomatic. A chronic sinus is defined as a sinus diagnosed and persisting longer than 6 months after ileostomy closure.

Management depends upon the presentation, size, location, symptoms, and whether the pouch is defunctioned.[18] The presentation may differ depending on whether the patient is diverted. Symptoms in defunctioned patients may include fever, perianal/back pain, and rectal drainage, while symptoms in undiverted patients may additionally include abdominal pain, pouchitis-like symptoms (pain, urgency), severe rectal burning, diarrhea, irritation, and itching.[18] In general, symptomatic presentation is a significant predictor for low healing rates and a high risk of eventual pouch failure.[20] Therapeutic options range from local treatments to major pouch revision and redo pouch, depending on the symptoms. In asymptomatic patients, and in those with a proximal ostomy where the condition is incidentally detected, observation may be all that is required. The majority will show healing on pouchogram within 6 months, and eventually undergo successful ileostomy closure.[18] Symptomatic sinuses and those that are defunctioned, but non-healing, may be managed by transanal drain placement, unroofing the sinus with or without opening the back wall of the pouch, or injection of fibrin glue.

A unique treatment option for a pouch sinus involves ultrasound-guided endoscopic needle knife therapy to open the orifice of the anastomotic sinus followed by topical injection of doxycycline (endoscopic sinusotomy, ESi).[21] Previous results have shown favorable outcomes with 49.5% of patients demonstrating complete healing of a chronic sinus after ESi with 20% developing pouch failure.[21] Another recent

study comparing outcomes of ESi with redo pouch surgery has shown complete healing of the sinus in 94% of redo surgery-treated patients and approximately half of ESi-treated patients.[22] Postprocedural adverse events were significantly more common in patients with redo surgery compared to those treated with ESi. During a median follow-up of 1.5 years, sinus recurrence-free survival and sinus-related surgery-free survival were comparable between the 2 groups.

The successful use of a linear stapler (endoGIA) to manage a posterior colorectal anastomotic sinus has been reported[23] and this technique can be used to manage posterior IPAA sinus. In this study, the limbs of the stapler were inserted into the rectal lumen and the sinus and the rectal wall overlying the sinus is stapled creating the sinusotomy. Healing of the sinus was confirmed in all patients using a contrast enema. Median time to healing was 10 weeks. All four patients had a diverting ileostomy which was eventually closed. No complications were noted. In suitably sized (long sinus with narrow neck) posterior ileal pouch anastomotic sinuses this technique therefore can be reasonably considered. Whitlow et al also reported on the use of the laparoscopic cautery scissors in the treatment of such sinuses in patients who had an ileoanal anastomosis. All the patients in this series had fecal diversion and the sinus resolved in 1 month except in one case when it needed 12 months to heal.[24]

When attempts at healing have failed or may not reasonably be anticipated because of the size or persistence of the sinus, a redo IPAA may be considered in symptomatic patients and those with large sinuses.[20] Sinuses that persist despite surgical intervention may also lead to a permanent stoma. Overall, patients with simple tracts are reported to have complete resolution in almost 100% of cases, while complex sinuses (defined as multiple sinuses {≥2} or branched sinus) have a treatment success rate around 50%.[19] In select circumstances, where a sinus tract below a defunctioning ostomy has not healed completely for a prolonged period in a patient who was not previously or is not currently symptomatic, a conscious decision may be taken to close the ostomy after due discussion with the patient about the possibility of the development of symptoms, septic manifestations or pouch failure requiring the re-creation of an ostomy.

Portal vein thrombosis

Portal vein thrombosis (PVT) defined as thrombus or thrombi in the portal or superior mesenteric veins is most commonly found during CT imaging for workup of abdominal pain after IPAA creation. Additional symptoms include unexplained fever, leukocytosis, and post op ileus.[25-27] The incidence of PVT is around 6% and carries morbidity related to prolonged length of stay (one week) and increased readmission rates. Previous data indicate that long-term pouch function and quality of life are not affected.[28,29] Both nonocclusive and segmental portal vein thrombi appear to be common after IPAA. Segmental portal vein thrombi are subtle and are identified as linear, thin, tubular structures coursing through the liver in the portal triad and connecting to normally enhancing intrahepatic portal veins. Segmental portal vein thrombi are commonly associated with peripheral, wedge-shaped areas of hyperenhancement in the hepatic parenchyma.[30] The increased risk of PVT in UC patients has been attributed to such predisposing factors as (1) the underlying prothrombotic state associated with inflammatory bowel disease and (2) traction and tension on the small bowel mesentery associated with the creation of the ileal pouch.[31] Two stage restorative proctocolectomy (RPC) and preoperative steroid use have recently been shown to be independently associated with PVT.[29] Operative maneuvers can increase the risk of PVT, for example in obese patients there may be difficulty with reach of the ileal pouch to the anal canal and small bowel mesentery requires mobilization as far as the third part of the duodenum. In addition, if further mobilization is necessary the peritoneal tissue to the right of the superior mesenteric vessels is excised or subjected to transverse 1- to 2-cm peritoneal incisions over the superior mesenteric vessels anteriorly and posteriorly. These measures may predispose to stretch injury on the vascular endothelium and lead to a thrombotic cascade of events or a shower embolism phenomenon resulting in PVT. Six-month treatment with oral anticoagulation is typically required to ensure resolution and prevent progression of the clot burden.

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