**CASE SUMMARY:** A 60-year-old man with a history of an IPAA for ulcerative colitis (UC) presented with a pouch-anal anastomotic (PAA) stricture (Fig. 1) refractory to endoscopic balloon dilation and needle-knife stricturotomy. After extensive counseling regarding surgical options, he declined operative intervention and was taught manual self-dilation; his obstructive symptoms remain improved to date.

**CLINICAL QUESTIONS**

- How are complications of IPAA for UC classified?
- How are IPAA complications prevented?
- What medical, endoscopic, and surgical options are available to treat ileal pouch complications?

**BACKGROUND**

Restorative total proctocolectomy with IPAA is the procedure of choice for most patients with UC, IBD unclassified (formerly indeterminate colitis), familial adenomatous polyposis, and, less commonly, isolated Crohn’s colitis. Complications after IPAA are common and significantly impact patient quality of life. Successful management requires a multidisciplinary approach including medical, endoscopic, and surgical interventions.

**PRESENTATION AND DIAGNOSIS**

Complications of IPAA for UC can be classified early vs late relative to pouch construction. Early complications are usually technical and, if a patient is still diverted, may be occult. Early complications include small-bowel obstruction (SBO), portomesenteric vein thrombosis, and pelvic sepsis from leaks from the tip or body of the J-pouch, or from the PAA with presacral sinus/abscess or pouch vaginal fistula.

Late complications are further classified as obstructive/mechanical (adhesive SBO, strictures, malrotated (twisted) pouch, pouch prolapse, megapouch, afferent limb syndrome, and S-pouch efferent limb syndrome), functional (pelvic floor dysfunction with outlet obstruction, fecal incontinence), inflammatory (pouchitis/cuffitis with tenesmus, urgency, and nonbloody diarrhea), or penetrating (perianal fistulas, anovaginal and pouch-vaginal fistulas). Fistulas and strictures may be either delayed technical complications or manifestations of “phenotypic switching” to Crohn’s disease (CD). Finally, pouch neoplasia is a rare but dread late complication.

Many IPAA complications (pouchitis, fistulas, strictures) are diagnosed by thorough history (symptoms, bowel habits), physical examination, digital rectal examination, and liberal use of examination under anesthesia (EUA). Other tests include the “pouchogram” which is a gastrografin enema using a “Christmas tree-tip” catheter in the distal anal canal as if the tip is above the PAA, a presacral sinus may be missed. Cross-sectional imaging includes CT or MR enterography to assess for proximal disease, and pelvic MRI to provide a preoperative “roadmap” in cases of penetrating complications, as well as local staging of cancers.

Pouchoscopy is the mainstay in diagnosis of inflammatory and neoplastic complications of the pouch, but may also identify presacral sinus and stricture, and may help diagnose otherwise occult malrotation of the pouch and tip of the J-pouch leaks. The former may result in abdominal pain with or without obstruction, whereas the latter requires a high index of suspicion in cases of recurrent abdominopelvic abscesses and a nondiagnostic gastrografin enema. Anorectal manometry and defecating pouchograms may aid in cases of functional complications.
MANAGEMENT

Prevention

The most important principle in preventing IPAA complications is patient selection, with minimization of malnutrition, anemia, and immunosuppression at the time of pouch construction. The impact of biologic agents on postoperative complications is controversial, but, at present, the majority of IPAA s in the United States are performed in a 3-stage manner.

Patient selection vis-a-vis sphincter function is crucial, because UC patients may have urgency from proctitis as opposed to weak sphincters; patients with true fecal incontinence may benefit from permanent ileostomy instead of IPAA. Finally, although colonic strictures may be seen in long-standing UC (lead-pipe colon), colitis with skip areas, enteritis, granulomas, or fistulas likely have CD and should not be offered IPAA.

Several complications are purely technical and may be prevented during IPAA construction. Minimizing PAA tension, assurance of good blood supply and of a nonrotated mesentery, mobilization of the rectovaginal septum with protection of the vagina to avoid incorporating it into the anastomosis, and intraoperative pouchoscopy with water- (ie, filling the pouch up with saline/betadine) and/or air-leak testing (as after any low pelvic anastomosis) are critical. When diverting an IPAA, the afferent limb of the loop ileostomy should always be cephalad because intentional rotation of the ileostomy, which may be more fully diverting in other conditions, is associated with SBO in IPAA because of mesenteric tension. Finally, the PAA should be 2 cm proximal to the dentate line, often corresponding to the surgeon’s proximal interphalangeal joint on digital rectal examination. An IPAA too close to the dentate line may result in fecal incontinence; one too high may lead to difficulty to treat cuffitis (ie, proctitis).

Treatment of Specific Complications

Anastomotic leaks (Fig. 2, left) are managed by a combination of drainage of abscesses, delaying ileostomy closure (or rediversion if highly symptomatic), serial EUAs, and patience on both the surgeon’s and patient’s part because many will heal with time. Presacral sinus is the result of a posterior PAA leak and is managed similarly but also with serial mushroom catheter downsizing and surgical unroofing (laying open) of the sinus. Endoscopic needle-knife sinusotomy is also an option. Leaks from the tip of the J-pouch may prevented, and treated, by staple line angulation so the antimesenteric tip is more proximal on the bowel and thus better vascularized.

Perianal fistulas follow the usual tenets of a staged approach with serial EUAs, abscess drainage, draining seton(s), and sphincter-preserving surgery. Pouch vaginal...
fistula is treated by advancement flap with or without re-diversion. For fistulous disease, medical therapy for underlying CD with an immune modulator and/or biologic therapy may be required.

Inflammatory complications include acute pouchitis (Fig. 2, right), which, after confirmatory pouchoscopy, usually responds to a short course of oral antibiotics. These include metronidazole or ciprofloxacin, although...
the latter has a black-box Food and Drug Administration warning for tendon rupture. Other oral antibiotics such as sulfamethoxazole/trimethoprim are also effective. Although chronic pouchitis may be antibiotic dependent, probiotics may help maintain remission; antibiotic-resistant pouchitis may or may not respond to biologics. Severe pouchitis may require rediversion or pouch excision as the inflammatory condition is likely recur after a neo-IPAA. Cuffitis often responds to mesalamine or hydrocortisone suppositories.

Obstructive complications are classified as functional or mechanical. Functional outlet obstruction is treated by lifestyle modification and physical therapy/biofeedback. Surgeons should be wary of operating for presumed mechanical SBO when a nonrelaxing pelvic floor is the true etiology, with megapouch, dilated prepouch ileum with no transition point, and a nonrelaxing pelvic floor. Nonrelaxing pelvic floor may also be associated with pouch mucosal prolapse and even frank incarceration. LAPAoscopic or open suture or mesh pouch pexy procedures are indicated for pouch prolapse.

Obstruction from PAA stricture are common and requires surgical dilation with Hegar dilators, endoscopic balloon dilation (Fig. 1), needle-knife stricureotomy, chronic self-dilation at home, and, in refractory cases, pouch advancement (Fig. 3, left). A malrotated pouch requires detorsion and a redo PAA. Classic afferent limb syndrome is when a loop of bowel becomes adhesed to the sacrum behind the pouch and given the risk of IPAA devascularization by posterior mobilization, enteropouch bypass may be indicated; however, afferent limb syndrome may also be caused by upstream mechanical narrowing, kinking, or strictures. In the latter, surgical strictureplasty is an option. The efferent limb of an S-pouch is prone to kinking as the pouch enlarges over time and may require efferent limb resection and handsewn reanastomosis (similar to Fig. 3, right). Finally, adhesions are the most common cause of SBO after IPAA and can be prevented by laparoscopy; laparoscopy also reduces adnexal adhesions and maintains fertility.

Rarely, pelvic nerve damage results in retrograde ejaculation, but sperm may be harvested from the urine after orgasm. Erectile dysfunction may respond to phosphodiesterase inhibitors, which can also be used in women to aid in lubrication and orgasm; lubricants and estrogen gel are recommended for dyspareunia from vaginal dryness. Importantly, fecundity is normal in women after IPAA, and in vitro fertilization may overcome infertility. Cesarean delivery is generally recommended after IPAA to avoid rare albeit disastrous sphincter damage. Fecal incontinence may be managed by the addition of fiber, bowel stoppers, Kegel exercises, physical therapy/biofeedback, and sacral nerve stimulation.

Neoplasia after IPAA is rare. Low- and high-grade dysplasia, after multidisciplinary discussion, may be treated endoscopically followed by close surveillance, but in young or fit patients, excision must be considered. For cancers of the anus (squamous or adenocarcinoma), rectal cuff, retained mucosa after mucosectomy, or pouch itself (ie, rectal or small-bowel adenocarcinoma), a multidisciplinary team approach and radical surgical extirpation is indicated.

**Definitive Surgical Options**

When a combination of medical, endoscopic, and local/minor surgical repairs is not an option or fails, the patient is left with one of several options. First is permanent redivision, which can be done laparoscopically in many cases; however, pouch surveillance is still needed. If redivision does not suffice, then options are to salvage the pouch by pouch advancement (Fig. 3, left), PAA revision (Fig. 3, right), or neo-IPAA construction, all with acceptable continence and quality of life. Finally, pouch excision with conversion to a permanent end or continent ileostomy (Kock pouch) may be required. When patients and surgeons are faced with these complex cases, high-volume IBD-specialty center referral may help salvage a patient’s failing pouch.
**EVALUATION AND TREATMENT ALGORITHM**

Evaluation and treatment algorithm of IPAA complications after IPAA for UC. EUA = examination under anesthesia; LIFT = ligation of intersphincteric fistula tract; SBO = small-bowel obstruction; UC = ulcerative colitis. ©CCF 2018. Used with permission of Cleveland Clinic Foundation, Cleveland Clinic OH.

**Expert Commentary on Prevention, Diagnosis, and Treatment of Complications of the IPAA for Ulcerative Colitis**

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The IPAA procedure has become the preferred operation for patients requiring proctocolectomy despite its greater risk for complications without an improved quality of life compared with ileostomy. The complications present soon after IPAA creation (eg, anastomotic dehiscence/leak, autonomic nerve injury, hemorrhage, pelvic abscess, portal vein thrombosis), around the time of planned/actual ileostomy closure (eg, anastomotic fistula/sinus, anastomotic stricture, ileal pouch body/J-tip leak), or months/years after restoration of intestinal continuity (eg, anal fistula, bowel obstruction, cuffitis, functional disorder, infecundity, neoplasia, outlet obstruction,
The procedure is facilitated by using a prone jackknife position and lighted retractors (eg, Hill Ferguson, Sauerbruch). A mucosectomy is initiated at the dentate line and carried cephalad to the anastomosis. The bowel wall is breached, and the dissection is carried 2 to 5 cm into the peripouch space. The diseased area is excised, any fistula tracts are closed as they enter the sphincter, and the pouch is advanced to the dentate line where it is secured using interrupted polyglycolic acid sutures incorporating the underlying internal sphincter and full thickness of the pouch wall. An intact sphincter must be ensured before using this approach for anovaginal fistulas.

Some patients will ultimately need a permanent ileostomy, in which case it is important to recognize that the quality of life is better with pouch excision than a permanently diverted pouch, but excision is associated with poor perineal healing that can be improved by using a staged approach and flap closure of large defects.

REFERENCES


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