Surgery for inflammatory bowel disease

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Ulcerative colitis is potentially cured by total excision of the colon and rectum. Crohn's disease is an unremitting condition in which operations are frequently multiple and in which the minimum amount of bowel possible should be excised.

The term inflammatory bowel disease (IBD) covers a spectrum of chronic relapsing conditions with extraintestinal manifestations. Crohn's disease (CD) lies at one end of the spectrum and ulcerative colitis (UC) at the other, with indeterminate colitis in between. CD is a granulomatous disease that affects any part of the gastrointestinal tract. UC is non-granulomatous and affects the colon and rectum only. About 5–10% of patients cannot be classified as CD or UC on histological examination and are termed indeterminate.

IBD patients receive optimal care under the joint supervision of a gastroenterologist and colorectal surgeon. Excision of the colon and rectum in UC will cure the patient, but neither medication nor surgery will cure CD. These patients are at increased risk of deep vein thrombosis and require prophylaxis for surgical procedures in the form of compression stockings and heparin (Hudson et al, 1996). Steroid use should be discontinued 14 days before surgery although if the adrenals are suppressed the patient may require steroids for the operation. Low serum albumin, steroid use and the presence of an abscess or fistula preoperatively increase the incidence of postoperative sepsis (Yamatot et al, 2000). The indications for surgery are shown in *Table 1*.

TABLE 1.
Indications for surgery

	Crohn's disease	Ulcerative colitis
Emergency	Failure to improve with medical treatment of colitis for 5 days or deterioration over 48 hours, massive haemorrhage, toxic megacolon, obstruction, perforation and peritonitis	Failure to improve with medical treatment of colitis for 5 days or deterioration over 48 hours, toxic megacolon, massive haemorrhage, perforation, obstruction
Elective	Fistulae, abscesses, stricture, failed medical treatment, side effects of medication, dysplasia, malignancy, growth retardation in adolescents	Failed medical treatment, side effects of medication, intractability, dysplasia, carcinoma, growth retardation in adolescents, severe extraintestinal manifestations

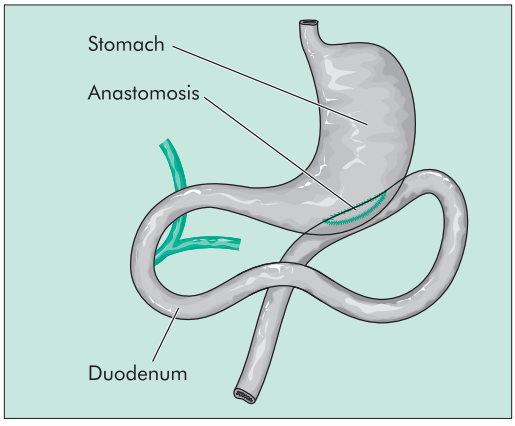
STOMACH AND DUODENUM

Approximately 32% of patients with CD have gastritis (Halme et al, 1996) and 17% of patients suffer from bleeding but surgery is rarely indicated (Nugent and Roy, 1989). The commonest indications are obstruction (70%) and pain (27%) (Nugent and Roy, 1989). Treatment is initially medical, but if this fails, options are strictureplasty, gastrojejunostomy (*Figure 1*) or roux-en-Y duodenojejunostomy (*Figure 2*). Addition of a vagotomy is controversial. Gastric (0.5%) or duodenal (0.6%) (Klein et al, 1987) fistulae arise almost solely from distal lesions. Initial treatment is medical but rarely successful and usually needs excision of the distal lesion and closure of the proximal site. Use of infliximab may change this.

JEJUNUM AND ILEUM

About 10% of the CD population require urgent surgery. Traditionally elective surgery has been delayed to the last possible moment; however, increasing evidence points to reduced complica-

Figure 1. Gastrojejunostomy.



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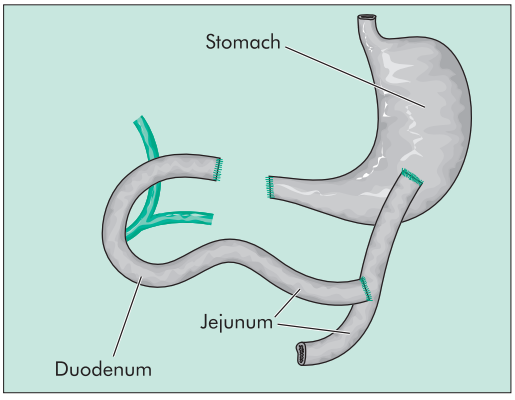


Figure 2. Roux-en-Y anastomosis.

tions for early surgery but resections must be balanced against the risk of developing short gut syndrome and a sufficient trial of medical therapy.

Stricturoplasty is used for short fibrotic strictures up to 15 cm in length. If active inflammation is present the patient is better treated by resection. Stricturoplasty is not usually used for colonic lesions and definitely not if lesions have perforated or fistulated, or in the presence of sepsis. Many different types of stricturoplasty exist:

- Heineke–Mikulicz procedure is used for short strictures (*Figure 3*)
- Finney procedure is used for medium strictures (*Figure 4*)
- Jaboulay procedure is an alternative for a medium stricture
- Judd procedure can be used if co-existent fistulae are present (*Figure 5*).

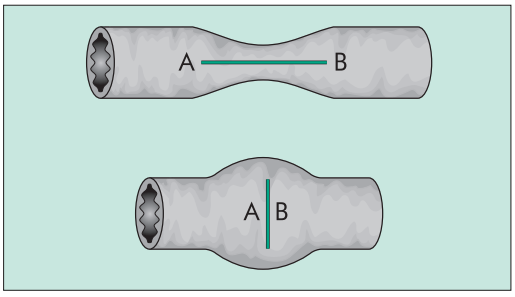


Figure 3. Heineke–Mikulicz stricturoplasty.

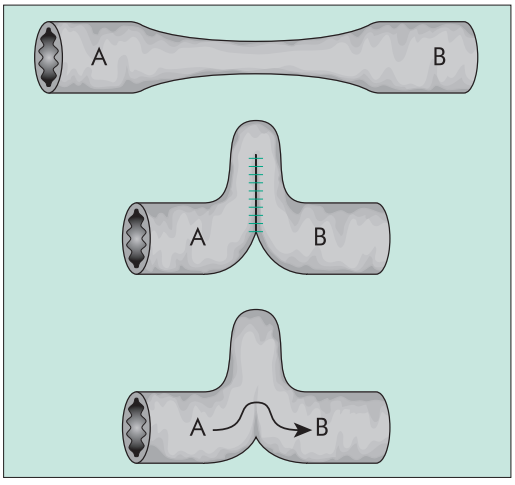


Figure 4. Finney stricturoplasty.

If resection is necessary, begin with mesenteric vessel division by suture ligation; this ensures vascularity of the margins is visible before resection. Should doubt exist regarding patency of the remaining bowel, marbles or an inflated Foley catheter passed along the length of the bowel will guarantee it (Fazio et al, 1996). Recurrence is greater following end-to-end anastomosis, so end-to-side or side-to-side anastomoses are preferred (Caprilli et al, 1996). Ikeuchi et al (2000) showed a lower rate of recurrence in stapled anastomoses. Perforated lesions are best excised and not oversewn as the bowel is usually obstructed distally and may require defunctioning.

Diffuse jejuno-ileitis is uncommon, and carries a poor prognosis with a high risk of sepsis and short gut syndrome. Of these patients, 20–25% recur at 5 years and 30–40% at 10 years (Jones and Mortensen, 2003).

Fistulae may arise anywhere and be spontaneous but are common in the ileocolic region and following surgery. The initial management is medical, but all sepsis must be drained and nutrition optimized. Results are excellent with surgery if required, but if this fails there is up to 50% mortality (Pettit and Irving, 1988). Surgery normally takes place after a 2–3-month trial of medical therapy and it is important that anastomoses are created in areas free of sepsis. Somatostatin analogues have shown no benefit in the treatment of fistulae (Scott et al, 1993).

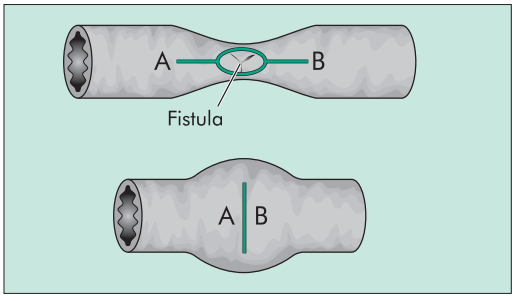
COLONIC

Crohn's disease

With whole colon involvement there is a 72% likelihood of surgery being required compared to 29% with segmental disease requiring surgery (Kornbluth et al, 1995). About 20–30% of patients with acute fulminating colitis have CD; 60% of fulminant colitics settle with medical management and 60% maintain remission (Kornbluth et al, 1995). Surgical treatment consists of a sub-total colectomy and end ileostomy (discussed later).

Strictures need colonoscopy with multiple biopsies to exclude malignancy. These are the com-

Figure 5. Judd stricturoplasty.



monest cause of obstruction in CD, involving the colon in 5–17% of patients (Friedman et al, 2001). Symptomatic colonic strictures are resected.

Ulcerative colitis

The disease affects the colon and rectum only, hence excision of this region will cure the disease unlike CD, which may recur. About 30% of patients have rectosigmoid disease only but resection and end colostomy results in a high rate of recurrence, with 25% needing further surgery (Clarke and Ward, 1980). Approximately 80% of patients with caecoanal anastomosis require excision at a later date (Johnston et al, 1989). Surgical options are restorative proctocolectomy (RP), total colectomy with ileoanal anastomosis, panproctocolectomy and either end ileostomy or continent Kock pouch (rare). The greatest likelihood of emergency surgery is in the first year of diagnosis, although this is still rare (Hendriksen et al, 1985).

Colonic surgery for IBD

Segmental colectomy: This is used in CD, and involves excision of the affected segment of colon.

Sub-total colectomy and ileostomy: The colon is resected but avoids rectal dissection, which is a cause of significant morbidity especially in emergency resections, hence this is the operation of choice in an emergency. The patient has an ileostomy, which may be reversed later. The rectal stump is left long and sutured to the anterior abdominal wall or brought out as a mucous fistula. Proctoscopy and biopsy are needed every 2 years because of the risk of malignancy developing. The patient must be informed of this risk.

Panproctocoletomy: This is the gold standard for colorectal CD and UC. The colon, rectum and anus are excised resulting in a permanent ileostomy. Patients with CD are susceptible to delayed perineal healing with 30% taking 4–6 months to heal and 10% taking longer. Intra-abdominal sepsis develops in 17% of patients (Jones and Mortensen, 2003). In CD small bowel recurrence occurs in 13% at 5 years, 17% at 10 years and 25% at 15 years (Jones and Mortensen, 2003); 20% require a second operation. Owing to pelvic nerve damage during rectal dissection 3.5% develop complete impotence and 13.5% develop partial impotence (Jones and Mortensen, 2003). No difference has been demonstrated between total mesorectal excision and closed dissection. About 25% have revision of the ileostomy for mechanical problems at 5 years (Leong et al, 1994).

Restorative proctocolectomy: In RP the colon and rectum are excised and an artificial rectum created from small bowel. The operation is performed as a one-, two- or three-stage procedure, involving colectomy, proctectomy and creation of reservoir, which may be covered with a temporary ileostomy. The reservoir is created using terminal ileum and forms the commonly used J pouch, although S, W, B or H pouches are also used (*Figure 6*). The ileal pouch is anastomosed to the anus either by hand or staples. An optional covering ileostomy protects the anastomosis but may cause dehydration, excoriation and morbidity when closed. A one-stage procedure is preferred but is only possible if the patient is in good health, not on high-dose steroids and the operation is uneventful. Studies report a better quality of life in UC with RP than Brooke ileostomy, Kock pouch or medical management (Pemberton et al, 1989; Sagar et al, 1993).

Complications following RP are numerous and patients require lifelong follow up. Haemorrhage is rare unless the patient has a bleeding diathesis. Small bowel obstruction usually settles with conservative management. Intra-abdominal and anastomotic abscess are usually the result of a pouch defect or leak following ileostomy closure. About 50% of intra-abdominal abscesses require a laparotomy possibly with a second ileostomy (Sagar and Pemberton, 2003), and 26% of patients developing intra-abdominal abscesses require pouch excision. Those retaining their pouch have an increased incidence of incontinence (Farouk et al, 1998). Strictures develop in 38% of patients, caused by tension and ischaemia, pelvic sepsis and anastomotic dehiscence (Lewis et al, 1994). Pouchitis varies from 10–60% according to diagnostic criteria; the cause is unknown (Lohmuller et al, 1990; Madden et al, 1990). An increased incidence of pouchitis is associated with primary sclerosing cholangitis (Penna et al, 1996). Failure rises over time to 13% at median follow up of 15 years (Tulchinsky and Nicholls, 2001).

Patients usually defaecate between 4 and 7 times daily and once during the night. They can discriminate between flatus and faeces and have a normal urge to defecate.

RP is controversial in CD because of the high incidence of complications ranging from 30% to 100% (Nicholls, 2003), and the ileum used in the anastomosis is lost if the pouch requires

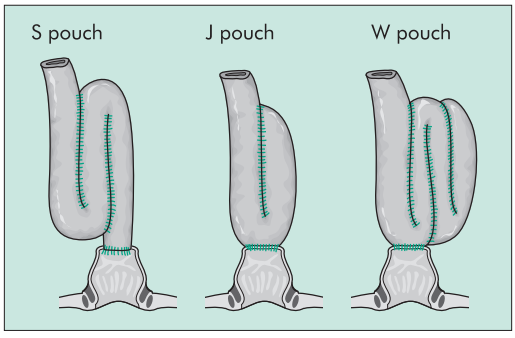


Figure 6. Types of ileal-anal pouch.

excision. However, some studies have shown selected patients have a good outcome with only 2 of 32 patients having their pouches excised when followed for 7 years (Panis et al, 1996). Generally CD is not an indication for RP.

Total colectomy and ileorectal anastomosis: About 25% of patients with CD have rectal sparing and are suitable for this procedure. UC still has a risk of rectal malignancy of 5% at 20 years (Baker et al, 1978). This is especially useful for young women who do not want to risk the reduced fertility associated with pelvic dissections. In 118 patients who underwent the procedure and were followed for a median of 9.5 years, 72 had a functioning anus of whom 42 had no further operations (Longo et al, 1992).

Ileoanal anastomosis: This results in high resting pressures and consequent faecal leakage, especially at night. This excludes it from use in adults but improvement occurs up to 3 years following the operation and the adaptive response seen in children means it continues to have a role (Martin et al, 1985; Morgan et al, 1987).

Diversion: Faecal stream plays an important role in CD pathogenesis. One study followed 55 patients who had stomas for diversion for 17 years; 48 patients (87%) developed remission, the stoma was closed in 25 patients and 11 had a good result with no relapse (Edwards et al, 2000). This is higher than another study demonstrating closure in only 4 out of 32 patients (Winslet et al, 1993). Stomas are sited preoperatively in the standing, sitting and supine positions to lie within the rectus abdominis away from skin creases. The ideal site is on the superior aspect of the infra-umbilical fat fold. Stoma may be loop, split, and ileocolostomy.

Rectovaginal and anovaginal fistulae affect 10% of women with CD. Rectal advancement flap is successful in 30% of anal and 70% of rectal fistulae (Makowiec et al, 1995; Ozuner et al, 1996). In recurrent fistulae there is a high failure rate and gracilis interposition or sphincteroplasty may be more effective (MacRae et al, 1995).

Laparoscopic techniques: Laparoscopic and laparoscopically-assisted techniques exist for all of the operations discussed above. Assisted techniques are preferred because of the reduced time taken for the procedure for the sake of a 4–5 cm incision. The advantages of laparoscopic surgery compared to open include reduced blood loss, postoperative pain and analgesic requirements; pulmonary complications, earlier postoperative recovery and reduced hospital stay in addition to cosmesis (Hershman and Francombe, 2003). The disadvantages of a prolonged learning curve and greater surgical expense will reduce with rapidly evolving technology being more widely availabile in time.

PERIANAL

Approximately 52% of patients with colonic CD and 14% of patients with small bowel CD have perianal disease (Williams et al, 1981). In 30–40% perianal symptoms precede the onset of intestinal symptoms by several years.

Skin tags

These are painless, and do not require surgery but may be biopsied if diagnosis is uncertain.

Haemorrhoids

Conservative management is required with topical preparations. If symptoms continue try rubber band ligation.

Fissure

These are multiple, occupy non-midline positions and are seen with other pathology, e.g. fistulas or abscesses. If asymptomatic these require no treatment, if symptomatic therapy includes metronidazole suppositories, 5-aminosalicylic acid or infliximab. The role of surgery is controversial.

Anal ulcers

These have a poor prognosis, and are associated with sepsis and fistulae that result in destruction of the anorectum.

Abscess

These require surgical drainage. The roof of the abscess should be sent for histology.

Fistulae

Medical management is undertaken initially. If unsuccessful and it is a low simple fistula with no proctitis fistulotomy is successful in 70–80% of cases (Williams et al, 1991; Scott and Northover, 1996). High anal fistulae require a seton (surgical stitch inserted across the sphincter muscle to preserve continence) or rectal flap advancement (Scott and Northover, 1996). Proctitis associated with a fistula requires a combination of a seton with medical management (Williams et al, 1991).

Anorectal strictures

These may require dilatation with Hagar's dilators, but when severe may need rectal excision.

CONCLUSIONS

Surgery for UC is curative but requires complex surgery with significant complication rates. CD is a disease for life and surgery may well be need to be repeated. Surgery for CD is complex and may require many different procedures. HM

Conflict of interest: none.

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KEY POINTS

- Crohn's disease is a chronic relapsing condition in which early surgery should be contemplated following a trial of medical therapy.
- Surgery must be balanced against the risk of short gut syndrome, and the length of all bowel excised should be documented.
- Ulcerative colitis may be cured by total excision of the colon and rectum and although restorative proctectomy is not without complications, studies indicate a better quality of life.