75 In f_l ammatory bowel disease

- Medical treatment
- Nutritional support
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- Radiology
- SURGERY
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A C U T E C O L I T I S

A C U T E C O L I T I S

Approximately 5% of patients present with acute severe (fulminant) colitis. Intensive medical treatment leads to remission in 70% but the remainder require urgent surgery . Toxic dilatation should be suspected in patients who develop severe abdominal pain and confirmed by the presence on a plain abdominal radiograph of a colon with a diameter of more than 6 /uni00A0 cm (Figure 75.3). A reduction in stool frequency is not always a sign of improvement in patients with acute severe colitis, and a falling stool frequency , abdominal distension and abdominal pain (resulting from progression of the suggestive of fulminant colitis and impending perforation. Plain abdominal radiographs or abdominal computed tomography (CT) may help monitor disease progression in patients with acute severe colitis, and a pr ogressive increase in colon diameter despite medical therapy is an indication for urgent surgery . Colonic perforation is a grave complication with a mortality rate of 40%. Steroids may mask the physical signs. Severe haemorrhage is uncommon (1–2%) but may occasionally require urgent surgical intervention.

Acute severe colitis

Acute severe colitis

- Patients with a mild attack usually respond to a course of oral prednisolone. A moderate attack often responds to oral prednisolone, twice-daily steroid enemas and 5-ASA. Failure to achieve remission as an outpatient is an indication for admission. Acute severe colitis occurs in up to 10% of patients, who require hospital admission. Regular assessment of vital signs, weight and the abdomen are required. A stool chart should be kept, regular clinical review is required and supine abdominal radiographs should be done when there is clinical concern for toxic megacolon. The presence of mucosal islands or intramural gas on plain radiographs, increasing colonic diameter or a sudden increase in pulse and temperature may indicate impending colonic perforation. Limited endoscopic assessment and reassessment is useful in monitoring response to treatment. Fluid and electrolyte balance must be maintained, parenterally . Initial treatment is with intravenous steroids. Regular and joint review by a gastroenterologist and a colorectal surgeon is essential to identify patients who are failing to make antici pated progress and to ensure that surgery is neither inappropri ately delayed nor inappropriately undertaken. Patients should be supported by IBD specialist nurses and early introduction to a stoma therapist is considered best practice. Instigation of immunosuppressive therapy with either intravenous ciclosporin A or an anti-TNF α agent ma appropriate; however, surgery should be considered if r therapy does not result in rapid clinical improvement for the patient. Clinical deterioration requires urgent colectomy .

Aetiology

Aetiology

The aetiology of CD remains incompletely understood but is thought to involve a complex interplay of genetic and environ mental factors. Although CD shares some features with chronic infections, particularly tuberculosis, no causative organism has ever been demonstrated. T here is an intriguing similarity to Johne’s disease of cattle, a chronic inflammatory enteropathy resulting from infection with Mycobacterium paratuberculosis suggesting that CD may have a related aetiology . Some studies have identified mycobacterial DNA more frequently in tissue from patients with CD than in tissue from controls, but trials have not demonstrated any therapeutic benefit of treating CD with antituberculous drugs. A wide variety of foods and a highly refined diet have been implicated in CD; however, no conclusive link has been proven. T here is considerable recent interest in food additives, particularly preservatives that may support a proinflammatory dysbiosis in the gut microbiome. An association with high levels of sanitation in childhood has also been implicated. Smoking increases the relative risk of CD threefold and is an exacer bating factor after diagnosis, contrary to the protective e ff ect seen in UC. Smoking cessation has a beneficial e ff ect on dis ease activity comparable to that of medical therapies and is therefor e an essential component in the e ff ective management of CD. Genetic factors are important in CD. Approximately 10% of patients have a fir st-degree relative with the disease, and concordance approaches 50% in monozygotic twins. Inheri tance is thought to involve multiple genes with low penetrance. Variants of NOD2/CARD15, a gene involved in intracellular recognition of bacteria, have been shown to have a strong asso ciation with CD. Recent genome-wide associa tion studies have identified activation of over 200 genes in IBD, some of which are associated with CD and others with UC. Most patients have no identifiable germline m utational signature, and epi genetic mutations are more likely to be involved. Both UC and CD are associated with alterations in the gut microbiome, with generally decreased microbial diversity . New techniques including next-generation 16S ribosomal RNA sequencing allow detailed analysis of individual microbial communities within the gut with sequential studies infor changes that might be associated with disease activity . Despite over a decade of intense study , no definitive signature of either CD or UC has been established, other than reduced microbial diversity , particularly in CD. Heinrich Albert Johne , 1839–1910, pathologist, Dresden, Germany . In both CD and UC increased gut mucosal permeability appears to develop at a relatively early stage and may lead to increased passage of luminal antigens that induce a cell- mediated inflammatory response. Proinflammatory cytokines, such as interleukin-2 and tumour necrosis factor, are then released. It has been suggested that CD is associated with a - defect in suppressor T cells. It is unclear whether the proposed increase in intestinal permeability is a cause or consequence of the disease process. Animal studies have suggested that the increase in gut permeability develops because of changes in bacterial recognition proteins and an increase in inflammatory gene activation before macroscopic evidence of inflammation - develops. Studies of healthy and apparently una ff ected first - degree relatives of patients with CD suggest that gut permea - bility is increased, which in turn suggests that a genetically determined increase in gut permeability , perhaps combined with an abnormal immune-

mediated response to colonisation , of the gut with enteric microflora, may initiate the disease.

Bacteriology

Bacteriology

A stool specimen should be sent for microbiological analysis when UC is suspected in order to exclude infective colitides, notably Campylobacter , which may be very di ffi cult to distin - guish from acute severe UC. Clostridium di ffi cile colitis may need to be considered in populations at risk of this disease (see Chapter 77). Cytomegalovirus infection is a major patho - gen in immunocompromised patients and can be di ffi cult to distinguish from UC. Superimposed infection may precipitate fulminant colitis.

CANCER RISK IN COLITIS

CANCER RISK IN COLITIS

The risk of cancer in ulcerative colitis increases with duration of disease. At 10 years from diagnosis, it is approximately 1%, increasing to 10–15% at 20 years and 20% at 30 years. Patients with pancolitis (defined as the presence of inflammation prox - imal to the splenic flexure) of more than 10 years’ duration should be entered into endoscopic screening programmes in order to detect clinically silent dysplasia, which is predictiv e of increased cancer risk. The value of screening programmes remains somewhat controversial, as most patients with UC who develop cancer (approximately 3.5% of all patients) pres - ent between attendances for screening colonoscopy . Malignant change, often atypical and high grade, may be multifocal or subm ucosal (Figure 75.4). Colonoscopic surveillance with dye spray (chromoendoscopy) or multiple biopsies every 10 /uni00A0 cm should look for subtle mucosal abnormalities, which can occur in flat mucosa or a DALM. Patients with UC and sclerosing cholangitis are also at a significantly greater risk of develop - ment of large bowel cancer.

CLASSIFICATION OF SEVERITY

CLASSIFICATION OF SEVERITY

The assessment of the severity of colitis is determined by the - frequency of bowel action and the presence of systemic signs of illness, as originally proposed by Truelove and Witts: - /uni25CF Mild disease is characterised by fewer than four stools hing daily , with or without bleeding. There are no systemic signs of toxicity . /uni25CF Moderate disease corresponds to more than four - stools daily , but with few signs of systemic illness. There may be mild anaemia. Abdominal pain may occur. Inflam - matory markers, including erythrocyte sedimentation rate - and C-reactive protein, are often raised. /uni25CF Severe disease corresponds to more than six bloody stools a day and evidence of systemic illness, with fever, tachycardia, anaemia and raised inflammatory markers. Hypoalbuminaemia is common and an ominous finding. /uni25CF Fulminant disease is associated with more than 10 bowel movements daily , fever, tachycardia, continuous bleeding, anaemia, hypoalbuminaemia, abdominal ten - derness and distension, the need for blood transfusion and, in the most severe cases, progressive colonic dilation (toxic megacolon). This is a ver y significant finding, suggestive of disintegrative colitis, and an indication for emergency surgery if colonic perforation is to be avoided.

Figure 75.3 Supine abdominal radiograph of a patient with acute colitis showing toxic dilatation of the transverse colon with classical mucosal ‘thumbprinting’ of the colonic mucosa (courtesy of Mr Sean Martin FRCSI, St Vincent’s University Hospital, Dublin, Ireland).

CLINICAL MANIFESTATIONS

CLINICAL MANIFESTATIONS

The clinical manifestations of IBD primarily depend on the diagnosis (either CD or UC), the location (small or large intestine, or both) and the extent of the disease. In the large bowel, the clinical presentation depends in large part on the extent of disease. If inflammation is confined to the rectum (proctitis), there is usually no systemic upset and extra-alimentary manifestations are rare. The main symptoms Sidney Charles Truelove , 1913–2002, gastroenterologist, Oxford, UK. Leslie John Witts , 1898–1982, Nu ffi eld Professor of Medicine, Oxford, UK. are rectal bleeding, tenesmus and mucous discharge. The disease often remains confined to the rectum, usually with - a benign course. Colitis is almost always associated with bloody diarrhoea and urgency . Severe and/or e xtensive colitis may result in anaemia, hypoproteinaemia and electrolyte - disturbances. Pain is unusual. Children with poorly controlled colitis may have impaired growth. The more extensive the disease, the more likely extraintestinal manifestations are to occur. Extensive colitis is also associated with systemic illness, characterised by malaise, loss of appetite and fever.

(a) ; high-power view of

CROHN’S DISEASE (REGIONAL ENTERITIS)

CROHN’S DISEASE (REGIONAL ENTERITIS)

Chronic inflammatory disease of the ileum, possibly first recognised by Morgagni in 1761 and described separately by Le´ sniowski and Dalziel in the early twentieth century , is known as Crohn’s disease after a key publication by Crohn, Ginzburg ly and Oppenheimer in 1932. It is characterised by a chronic - full-thickness inflammatory process that can a ff ect any part of the gastrointestinal tract from the lips to the anal margin. It is most common in North America and northern Europe, with an annual incidence of 8 per 100 /uni00A0 000. CD is slightly more common in women and is most frequently diagnosed between the ages of 25 and 40 years. There is a second peak of incidence around the age of 70 years. The prevalence is - highest among white people, notably in North America and - north-western Europe. CD is less common in central Europe incidence is rising in Asia, which is attributed to increased urbanisation. There are di ff erences in clinical manifestations in Asian populations, with a higher male predominance, more perianal involvement, fewer extraintestinal manifestations and worse clinical outcomes. The prevalence of CD seems to be three to five times higher in the Ashkenazi Jewish population, although it is lower in the Jewish population in Israel, suggest ing the importance of environmental factors.

Clinical features

Clinical features

The clinical presentation depends on the pattern of disease. Occasionally , CD presents acutely with ileal inflammation and symptoms and signs resembling those of acute appendicitis or, much less commonly , free perforation of the small intestine resulting in a local or di ff use peritonitis. CD may present with acute severe colitis but this is considerably less common than in UC. Small bowel CD often presents with bouts of abdominal pain and mild diarrhoea. A tender mass may be palpable in the right iliac fossa. Intermittent fever, anaemia and weight loss are common. After months of repea ted attacks characterised by acute inflammation, the a ff ected area of intestine steno ses with fibrosis, causing chronic obstructive symptoms. Chil dren developing the illness before puberty may have retarded growth and sexual development. As CD progresses, transmural fissuring, intra-abdominal abscesses and fistulae may develop. Fistulation ma y occur into adjacent loops of bowel (entero - enteric or interloop fistulae). Occasionally , a mobile loop of sigmoid loop may become adherent to the a ff ected terminal ileum, resulting in ileosigmoid fistulation (Figure 75.11). The fistula tracks in such cases are usually small and the profuse diarrhoea that results from ileosigmoid fistulation is due vergrowth (attributable to colonisation primarily to bacterial o of the small bowel with colonic flora) rather than passage of small bowel content into the colon. Fistulation may also occur into the bladder (enterovesical), the female genital tract or, less commonly , the duodenum. Fistulation to the abdominal wall (enterocutaneous fistula) may also develop spontaneously or following appendicectomy in unrecognised CD, but more commonly presents as a complication of abdominal surgery .

Figure 75.11 Resected specimen of terminal ileum and sigmoid colon illustrating Crohn’s disease of the terminal ileum with multiple enterocolic /f_i stulae.

Colonic Crohn’s disease

Colonic Crohn’s disease

Colonic involvement is found in 30% of patients with CD, frequently in association with perianal disease, and may coexist with small bowel pathology . Colonic CD presents with symptoms of colitis and proctitis as described for UC, although toxic megacolon is much less common. Colonic strictures may form just as are seen in small bowel CD. Endoscopic dilatation may be performed in expert hands as an alternative to surgical resection. Distinguishing between CD and UC is often di ffi cult and requires clinical and pathological patterns to be combined. The presence of skip lesions, rectal sparing, non-caseating granulomas or perianal disease will point to CD (Figure 75.12). Many patients with CD present with perianal problems. In the presence of active disease, the perianal skin can have a bluish tinge. Large, oedematous and inflamed skin tags are common. Fissures and superficial ulcers with undermined edges are rela tively painless and can heal with bridging of epi - - thelium. Deep cavitating ulcers are usually found in the upper - anal canal; they can be painful and cause perianal abscesses and fistulae. Fistulation through the posterior wall of the vagina may lead to rectovaginal fistula and contin uous leakage of gas and/or faeces per vagina (see Chapter 80).

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The rectal mucosa is often spared in CD and will feel nor mal on rectal examination. If involved, it may feel thickened, nodular and irregular. Severe CD proctitis may occasionally be mistaken for cancer. Perianal disease is frequently associ ated with dense, fibrous stricturing (stenosis) at the anor junction. Incontinence may develop because of destruction of the anal sphincter musculature owing to inflammation, abscess formation, fibrosis and repeated sur gical drainage. In severe cases, the perineum may become densely fibrotic, rigid and covered with multiple discharging openings (watering-can perineum). Each patient with CD should have their disease phenotype (manifestations) classified according to the Montreal classifica tion (Table 75.3). This is important as it allows an overview of disease progression in the individual patient ov er time, and enables group comparisons and evaluations. The Montr classification specifies age at diagnosis, behaviour and disease location.

Figure 75.12 Colonic Crohn’s disease. Note the normal mucosa on either side of the in /f_l ammatory stricture (courtesy of Professor Brian Warren, John Radcliffe Hospital, Oxford, UK).

Duodenal Crohn’s disease

Duodenal Crohn’s disease

The duodenum is an uncommon site for CD and involvement is more commonly the result of inflammation in another part of the bowel as a bystander e ff ect (secondary). This can often be managed by resection of the source of the fistula with direct duodenal repair if the defect is small or closure using an omental patch or duodenojejunostomy if the defect is sizeable. Duodenal strictures may be amenable to endoscopic balloon dilatation; however, strictureplasty , bypass gastrojejunostomy or gastroduodenostomy may be required.

EXTRAINTESTINAL MANIFESTATIONS

EXTRAINTESTINAL MANIFESTATIONS

Arthritis occurs in around 15% of patients and is typically an asymmetrical large joint polyarthropathy , a ff ecting knees, ankles, elbows and wrists. Sacroiliitis and ankylosing spondy litis are 20 times more common in patients with UC than in the general population and are associated with the HLA-B27 genotype. Sclerosing cholangitis is associated with UC and can progr ess to cirrhosis and hepatocellular failure. Cholangiocar cinoma is a rare association, but its frequency is not influenced by colectomy (see Chapter 71). The skin lesions erythema nodosum and pyoderma gangrenosum are associated with UC and both normally resolve with good colitis control. The eyes can be a ff ected by uveitis and episcleritis. Extraintestinal manifestations

The extraintestinal manifestations of CD are similar to those that occur in UC. Primary sclerosing cholangitis is relatively rare in CD, compared with UC. Gallstones are common, as an inflamed or absent (because of resection) terminal ileum leads to reduced absorption of bile salts. Amyloidosis is common but is rarely symptomatic. Metastatic CD can occur in the vagina and/or skin with nodular ulcers, which demonstrate non-caseating granulomas when biopsied. Such cutaneous CD can be virtually indistinguishable macroscopically from hidradenitis suppurativa.

Endoscopic dilatation in Crohn’s disease

Endoscopic dilatation in Crohn’s disease

Although penetrating disease will often require surgical resec tion, stricturing may be amenable to endoscopic treatment. This may be accomplished by enteroscopy or colonoscopy , depending on the site of the stricture. Dilatation of an the risks of perforation, but balloon dilatation of fibrostenotic - disease may result in substantial symptomatic improvement and obviate the need for surger y in selected cases. It is most suited for short (<5 /uni00A0 cm) fibrostenotic strictures, including those seen at a previous anastomosis.

Endoscopy

Endoscopy

Colonoscopic examination may be normal or show patchy eal inflammation. Characteristically , there are areas of normal mucosa in between areas of inflammation that are irregular and ulcerated, with a mucopurulent exudate. The earliest findings are often aphthous ulcers surrounded by a rim of erythematous mucosa. These become larger and deeper with increasing severity of disease. There may be stricturing, and it is important to exclude malignancy at these sites by multiple and often repeated mucosal biopsies. An irregular Crohn’s stricture with polypoid mucosa may be almost macroscopically indistinguishable from malignancy . The terminal ileum may be ulcerated and strictured. In patients who have had previous ileocaecal resection and anastomosis, recurrent disease usually presents first with aphthous ulceration just proximal to the anastomosis. Interval colonoscopy is therefore important in the follow-up after surgery for CD. Upper gastrointestinal symptoms may require upper gas - trointestinal endoscopy , which may reveal deep longitudinal ulcers and cobblestoning of the mucosa in the duodenum, stomach or, rar ely , in the oesophagus or mouth. Enteroscopy may reveal jejunal ulceration and stricturing. Capsule endos - copy , which allows visualisation of the entire small intestinal mucosa by telemetry , has a useful role in those patients with - evidence of chronic gastrointestinal symptoms or blood loss and where no evidence of ulcera tion can be found with more conventional endoscopic assessment. Investigation of the small intestine by capsule endoscopy should not be undertaken when there is a suspicion of stricture because of the possibility of the capsule becoming impacted in the narrow segment. A biode gradable test capsule can be used if this is a source of concern. Imaging High-resolution ultrasound in expert hands can demonstrate inflamed and thickened bowel loops as well as fluid collections and abscesses – the string sign of Kantor (Figure 75.13 CT scans with oral contrast are widely used in the investi gation of abdominal symptoms and can demonstrate fistulae, intra-abdominal abscesses and bowel thickening or dilatation. Magnetic resonance imaging (MRI) is useful in assessing com plex perianal disease and has been shown to be an excellent method for in vestigating the small bowel. Magnetic resonance enterograph y (oral contrast) or enteroclysis (contrast adminis tered via nasoduodenal tube) is particularly e ff ective at demon strating small bowel stricturing, including the string sign of Kantor, and avoids the need for repeated exposure to large doses of ionising radiation in young patients (Figure 75.14 labelled white cell scan is occasionally of value to determine whether or not a segment of bowel is actively inflamed and to guide decisions on medical treatment. In patients with an enterocutaneous fistula, fistulography may help to demonstrate the anatomy and complexity of the fistula and allow adequate planning for future surgery .

Figure 75.13 Radiograph showing a small bowel enema illustrating a long, strictured segment of terminal ileum due to Crohn’s disease (string sign of Kantor).

FURTHER READING

FURTHER READING

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I N V E S T I G A T I O N S Endoscopy and biopsy

I N V E S T I G A T I O N S Endoscopy and biopsy

Rigid/flexible sigmoidoscopy can detect proctitis in the clinic; - the mucosa is hyperaemic, bleeds on touch and there may be a -

Figure 75.4 Resection specimen from a patient with longstanding ulcerative colitis showing a narrow tubular colon with areas of cancer

ous change in the rectum and sigmoid (arrows) (courtesy of the late Professor Brian Warren, John Radcliffe Hospital, Oxford, UK).

purulent exudate. Where there has been remission and relapse, there may be regenerative mucosal nodules or pseudopolyps. Later, tiny ulcers may be seen that appear to coalesce. Colonos copy with biopsy has a key role in diagnosis and management: /uni25CF to establish the extent of inflammation, although colonos copy is contraindicated in severe acute colitis because of the risk of colonic perforation; /uni25CF to distinguish between UC and Crohn’s colitis (Table 75.1 /uni25CF to monitor the response to treatment; /uni25CF to assess longstanding cases for malignant change. Endoscopic findings can be combined with clinical features and the physician’s assessment to produce a disease activity score. The most widely used is the Mayo score, which provides a useful tool for measuring disease prog ression or response to treatment (Table 75.2).

Crohn’s disease (CD). UC CD Macroscopic Distribution Colon/rectum Anywhere in the gastrointestinal tract Rectum Always involved Often spared Perianal disease Rare Common Fistula formation Rare Common Stricture Rare Common Microscopic Layers involved Mucosa/submucosa Full thickness Granulomas No Common Fissuring No Common Crypt abscesses Common Rare

INDETERMINATE COLITIS

INDETERMINATE COLITIS

Approximately one in 10 patients with colitis presents with histological features that make their disease di ffi cult to charac - terise. While the clinical history may suggest the diagnosis in some cases (for example, a history of recurrent perianal sepsis and fistulation would make a diagnosis of CD more likely), in others it may remain unclear whether a pa tient has UC or CD. In such cases, it may still be appropriate to o ff er IPAA after detailed informed consent, but the risks of pouch failure appear to be significantly higher (up to 25–30%) and patients should be advised accordingly . -

INFLAMMATORY BOWEL DISEASE

INFLAMMATORY BOWEL DISEASE

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Ileal pouch–vaginal fistula

Ileal pouch–vaginal fistula

Ileal pouch–vaginal fistula is most commonly due to an anastomotic complication; however, a delayed presentation may reflect an underlying diagnosis of CD rather than UC. Management depends on cause: biological therapy for CD, diverting ileostomy if there is complex sepsis, and definitive repair with interposition of native tissue if the sepsis resolves and CD has been excluded.

Indications for surgery

Indications for surgery

Surgery has a significant role in managing complications of IBD and in improving quality of life for patients with IBD. Current best practice ensures that surgeons and stoma therapists are an integral part of the multidisciplinary team throughout a patient’s journey and that surgery is not presented as a last resort. Patients are then more likely to accept timely surgical intervention when indicated and be better prepared for life with a temporary or permanent stoma. The overall lifetime risk of colectomy for a patient with UC is about 20%. Common indications for surgery in the emergency setting include refractory acute severe colitis or its complications, including perforation, toxic megacolon or, rarely , colonic haemorrhage not controlled by endoscopic or interventional radiological means. The indications for surgery in UC are: /uni25CF severe or fulminating disease failing to respond to medical therapy; /uni25CF chronic disease with anaemia, frequent stools, urgency and tenesmus; maintained without substantial doses of steroids with harmful side e ff ects; /uni25CF intolerance or side e ff ects of medical therapy required to - control the disease, e.g. steroid psychosis, azathioprine - - induced pancreatitis; /uni25CF growth retardation in children or adolescents; /uni25CF neoplastic change: patients who have severe dysplasia or carcinoma; /uni25CF associated sclerosing cholangitis; /uni25CF y be extraintestinal manifestations; /uni25CF escue rarely , severe haemorrhage or stenosis causing obstruction.

(a) Figure 75.6 Subfascial closure of the rectal remnant following subtotal colectomy and end-ileostomy for acute ulcerative colitis remnant can alternatively be brought to the skin as a mucus /f_i stula

Indications for surgery

Population-based studies show that approximately 70% of patients with CD will require a bowel resection in the first decade α after diagnosis, and 40% will require a further resection in the decade after their index resection. Recent population-based - data in the era of monoclonal antibodies suggest that the incidence of surgery may be falling, but surgery nevertheless remains a key component of treatment. Surgical resection will not cure CD. Surgery there - fore focuses on managing the complications of the disease (Summary box 75.2). As many of these indications for surgery may be rela tive, joint management by an aggressive physician and a conservative surgeon is ideal and decisions regarding sur - gical intervention are best made by a multidisciplinary team in consultation with the patient and recognising their preferences. - The fundamental principle is to preserve healthy gut and to - maintain adequate function. Intestinal resection should be kept to the minimum required to treat the local consequences of disease to mitigate against the potential for short bowel syn - drome (see Chapter 91). In laparoscopic surgery it may be more di ffi cult to assess the full length of the small intestine, so up-to-date preopera - tive small bowel imaging is important. While surgery carries perioperative risks, it also carries significant benefits, notably in patients with isola ted terminal ileal disease, in whom a pro -

longed period of good health may be achieved. T he relative benefits of surgical resection and long-term medical therapy in CD can be very finely balanced and require careful consid - eration and discussion with the pa tient within the setting of a combined gastroenterological and surgical IBD clinic. Summary box 75.2 Principles of management of CD /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF Occasionally unsuspected ileal inflammation is found - during emergency appendicectomy . Determining whether or not to resect the ileum in this situation is a complex clinical decision that should be made by a senior surgeon.

Close liaison between physician and surgeon is crucial Both medical and surgical treatment options should be considered; however, surgery should not be delayed when there is a clear indication Patients must be optimised prior to surgery; this may include radiological drainage of sepsis, antibiotic treatment and nutritional support CD is a chronic relapsing disease with a high likelihood of reoperation; the surgeon must take every reasonable effort to preserve bowel length and sphincter function Shared decision making with patients to accommodate their treatment preferences

ileitis is an expression of CD rather than another aetiology such as Yersinia infection; an assessment of the likelihood of remission with medical therapy rather than surgery; risk of enterocutaneous fistulation from appendiceal base leakage; and an assessment of the rest of the small bowel for the presence of additional sites of inflammation. In the current era of monoclonal therapy , it would be controversial to resect uncomplicated terminal ileitis found during an emergency procedure for suspected appendicitis, as this is likely to respond to medical therapy . If reasonably safe, appendicectomy is now encouraged for histological confirmation in limited previously undiagnosed disease, with appendicectomy carried out using a laparoscopic stapler to reduce the risk of enterocutaneous fistula (see Chapter 76). The course of CD after surgery is unpredictable, but recrudescence (a better term than recurrence) is common. Symptomatic recrudescence does not seem to be rela ted to the presence of disease at the resection line. The cumulative prob ability of recrudescence requiring surgery for ileal disease is approximately 20%, 40%, 60% and 80% at 5, 10, 15 and 20 years, respectively , after a previous resection. Surgery for CD is technically demanding as the in volved mesentery is thickened and oedematous and healing may be impaired (see Chapter 65). The patient may be malnour ished, on immunosuppr essants or have active infection/sepsis, or potentially all three. Decision making regarding the timing and nature of surgery to be undertaken is key to a satisfac tory outcome of surgical trea tment, and frequently requires experience and multidisciplinary discussion with other health care professionals and, most importantly , the patient. A key decision must be made whether to anastomose the apparently healthy bowel ends after macr oscopically apparent disease has been resected, as anastomotic leaks and fistulation represent a considerable problem after surger y for CD. Intra-abdominal septic complications are more common if one or more of the following risk factors are present: /uni25CF current high-dose steroid therapy (>10 /uni00A0 mg prednisolone for >4 weeks before surgery); /uni25CF current or very recent (<14 days) preoperative monoclonal antibody therapy; /uni25CF preoperative significant weight loss (>10% premorbid weight); /uni25CF coexisting abdominal sepsis (notably an abscess or fistula); /uni25CF low serum albumin <30 /uni00A0 g/L. If any risk factors are present (and particularly if more than one risk factor is present as the risks appear to be addi tive), one should consider exteriorising the bowel to create a stoma, with distal segment closure left close to the ileostomy site , and plan a delayed anastomosis when the risk factors have been corrected. Ileocaecal or colonic resections can be undertaken lapa

roscopically , with the potential advantage of smaller incisions and potentially shorter recovery time. Reoperative surgery Walter Hermann von Heineke , 1834–1901, Professor of Surgery , Erlangen, Germany . Jan Mikulicz-Radecki , 1850–1905, surgeon, Kraków and later Königsberg and Wroc ł aw , Poland. John Miller Turpin Finney , 1863–1942, surgeon, Johns Hopkins Medical School, Baltimore, MD, USA. adhesions and fistulae can be di ffi cult to safely dissect lapa - roscopically . Laparotomy should be considered in this setting. Although CD is usually regarded as a contraindication to ileal pouch surgery , the other options (panproctocolectomy or total colectomy with ileorectal anastomosis) are frequently appro - priate and ther e may be considerable rectal sparing in CD, justifying the latter. Where the diagnosis of CD is firmly estab - lished, segmental rather than total colectomy may be appro - priate. The range of operations perfor med for CD depends on the pattern of disease; the most common are outlined below: /uni25CF Ileocaecal resection is the usual procedure for termi - nal ileal disease, with a primary anastomosis between the ileum and the ascending or transverse colon, depending on the extent of the disease. Ileostomy without primary anastomosis is indicated if the patient is unwell, has active infection or is nutritionally depleted. - /uni25CF Segmental resection of short segments of small or large bowel strictures can be performed. /uni25CF Colectomy and ileorectal anastomosis may be undertaken for colonic CD with rectal sparing and a nor - mal anus. /uni25CF Subtotal colectomy and ileostomy for Crohn’s coli - - tis accounts for 8% of such procedures for acute colonic disease. The indications are similar to those for UC. /uni25CF Temporary loop ileostomy . This can be used either - in patients with acute distal CD, allowing remission and later restoration of continuity , or in patients with severe - perianal or rectal disease. /uni25CF Panproctocolectomy . Many patients with severe anal disease failing to respond to medical treatment will even - tually require a permanent colostomy . When this occurs in a setting of severe colonic disease, proctocolectomy and permanent ileostomy may be required. /uni25CF Strictureplasty . Strictured areas of CD (Figure 75.15a) can be treated by strictureplasty , a local widening proce - dure, to avoid small bowel resection and is thus an import - ant bowel-sparing technique. Strictureplasty is particularly useful for the treatment of fibrostenotic disease when there is little or no active inflammation in the involved segment. Strictureplasty is contraindicated in the presence of a phlegmon, Cr ohn’s associated cancer or haemorrhage due to mucosal ulceration. If there is any concern about malig - nancy at the site of a stricture, then frozen biopsy carried out intraoperatively may allow a strictureplasty to take place rather than resection, although resection and formal - histological assessment remains the better option if there is any doubt. Multiple strictureplasties can be perf ormed and strictureplasty can be combined with resection. The Heineke–Mikulicz technique of an antimesenteric lon - gitudinal incision that is closed transversely is the most - common technique. A Finney antimesenteric side-to-side anastomosis is used to treat long segments of stenosis when preservation of bowel length is important (Figure 75.15b). Recent clinical research has pointed towards the impor tance of the mesentery in disease recurrence following resec tion (see Chapter 65). Complete excision of macroscopically diseased mesentery may reduce the incidence of recurrence, as may anastomotic techniques that ensure that an anastomosis is fashioned on the antimesenteric aspect of the bowel (Kono-S pr ocedure). Irrespective of the site of resection or anastomotic tech nique used, it is important to follow patients closely in the postoperative months to ensure that recrudescence of CD is identified at a very early stage and medical treatment reinsti tuted. A strong case can be made for restarting pr ophylactic biological treatment subject to endoscopic review at 6 months following resection.

Figure 75.15 (a) Crohn’s disease affecting the jejunum and ileum (jejunoileitis) with multiple strictures and bowel dilatation between skip lesions. (b) Same patient following multiple strictureplasties: Heineke–Mikulicz (arrows) and Finney (arrowheads).

Introduction

INTRODUCTION

The term inflammatory bowel disease (IBD) is reserved for conditions characterised by the presence of idiopathic intes tinal inflammation. Conditions such as infective or ischaemic enteritis are covered in Chapters 6, 74 and 77 . Crohn’s disease (CD) may a ff ect any portion of the gastrointestinal tract from mouth to anus, most typically the distal ileum, the anal canal and the lar ge bowel, whereas ulcerative colitis (UC) is confined to the large intestine is characterised primarily by mucosal inflammation, whereas CD most typically involves transmural inflammation. On occasion there may be di ffi culty distinguishing UC from CD in the colon. This occurs in approximately 10% of patients with colitis; in such instances the term indeterminate colitis (IC) may be used. The incidence and prevalence of IBD is highest in Europe and North America, where it a ff ects around 3 in 1000 people. The overall incidence is steadily rising w orldwide, linked to improved public hygiene, dietary changes and industrialisa tion. Both UC and CD occur in individuals who may have a genetic predisposition and who are exposed to environmental factors that trigger abnormal immune responses that lead to intestinal inflammation. Microscopic colitis includes two main subtypes: lymphocytic colitis and collagenous colitis (CC). The aetiolog y is uncertain but may reflect inappropriate immune responses to alterations in the gut microenvironment conse quent to oral drug ingestion, particularly non-steroidal anti inflammatory drugs. UC is characterised by mucosal inflammation of the large bowel, always involving the rectum (proctitis) and extending to involve varying degrees of mor e proximal colon (colitis). When the entire colon and rectum are involved (pancolitis), some patients may also have a degree of ‘backwash ileitis’, in which there is secondary inflammation in the terminal ileum. Burrill Bernard Crohn , 1884–1983, gastroenterologist, Mount Sinai Hospital, New Y ork, NY , USA. - . UC - UC is a chronic condition that tends to be relapsing and remitting. Early relapse and persistent disease within the first 2 years of diagnosis are both predictors of a severe disease course. The extent of disease may also change after initial diagnosis; half of patients with UC a ff ecting the rectum or rectosigmoid progress to develop more proximal disease. - Histological hallmarks of UC typically include atrophy - and distortion of the crypts, irregularity of the mucosal villi, marked infiltration of plasma cells within the deep lamina pro - pria (basal plasmacytosis) and m ucus depletion, but none of these is pathognomonic; the diagnosis ultimately depends on clinical correlation, disease course and elimination of other potential causes, especially infection (Figure 75.1). Pseudo - polyposis occurs in almost one-quarter of cases. Stricturing in

The principles of medical management • The role of surgery

in acute and elective settings • The management of postoperative complications and • long-term outcomes Figure 75.1 Mucosal biopsy in ulcerative colitis illustrating in /f_l amma

tory in /f_i ltrate and crypt abscess formation.

UC is very unusual (unlike in CD) and should prompt urgent assessment because of the possibility of coexisting carcinoma. A small proportion of patients develop irregular mucosal swell ings (dysplasia-associated lesions or mass [DALMs]), which are highly predictive of coexisting carcinoma. CD (see Crohn’s disease (regional enteritis)) is char acterised by discontinuous transmural inflammation of the bow el caused by transmural inflammation of any part of the gastrointestinal tract from mouth to an us, but most commonly the ileocaecal region, colon and anus. There is often a degree of rectal sparing when the colon is involved. The transmural inflammation may be patchy (rather than di ff use) and crypt distortion is commonly seen. Histology typically demonstrates discontinuous segments of disease or ‘skip lesions’, involve ment of the terminal ileum and the presence of granulomas with a tendency for more marked inflammation in the proxi mal colon (Figure 75.2). Clinical correlation of histopathology with endoscopic and radiological findings is key to clinc the diagnosis of CD. Stricturing in the colon, while usually benign in CD, may mask an underlying neoplasm. When endoscopic and histological appearances do not cat egorically confirm either UC or CD, and the term IC is used, the clinical phenotype may help define the diagnosis, especially if there ar e features of small bowel or perianal disease sug gestive of CD. Patients with IC may la ter come to a definitive diagnosis of UC or CD, depending on the disease course.

Figure 75.2 Photomicrographs of Crohn’s disease illustrating mucosal ulceration and transmural in /f_l ammation (arrows) non-caseating granulomas (b) (courtesy of Professor Kieran Sheahan, St Vincent’s University Hospital, Dublin, Ireland).

Investigations Laboratory

Investigations Laboratory

A full blood count should be performed as anaemia is common, resulting from iron deficiency owing to blood loss, malabsorp tion or chronic disease. Vitamin B12 and folate deficiency may occur as a consequence of terminal ileal disease or resection. - - Active inflammatory disease is usually associated with low ectal serum albumin, magnesium, zinc and selenium. Acute-phase protein measurements (C-reactive protein) and erythrocyte sedimentation rate may correlate with disease activity . An elevated faecal concentration of calprotectin, a protein marker of mucosal inflammation, may support a diagnosis of CD in patients with new onset of persistent gastrointestinal symptoms. It can also be used to monitor disease activity in the long-term management of established CD. -

disease. A: age at diagnosis A1 ≤ 16 years old A2 17–40 years old A3

> 40 years old B (behaviour): B1 In /f_l ammatory progression B2 Stenosing B3 Penetrating p Perianal (can exist with any of the above) L: location L1 Ileal L2 Colonic L3 Ileocolonic L4 Upper digestive tract; can be added to any of the three above After Silverberg MS, Daly MJ, Moskovitz DN et al . Diagnostic mis

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classi /f_i cation reduces the ability to detect linkage in in /f_l ammatory bowel disease genetic studies. Gut 2001; 49 : 773–6.

Learning objectives

Learning objectives

To understand: The aetiology and pathology underlying in /f_l ammatory • bowel disease The distinguishing features of ulcerative colitis and • Crohn’s disease

Medical treatment

Medical treatment

Improved understanding of the complex cell signalling path ways that underlie aberrant immune responses in both UC and CD has radically changed treatment algorithms. The focus is now on both clinical and endoscopic remission end points with the aim of controlling symptoms and preventing disease progression. The particular c hoice of anti-inflammatory agent or immunosuppressive drug, the sequence and combination of use must take into account individual disease phenotypes, coexisting conditions, patient preferences, response to treat ment, side e ff ects and treatment availability . There has been a paradigm shift in treatment algorithms from escalation ther apy in response to treatment failure to a top-down approach predicated on achie ving clinical and endoscopic remission with subsequent de-escalation of treatment to maintain remission. Conventional first-line treatment has been 5-aminosalicylic acid (5-ASA) derivativ es given topically (per rectum) or system ically . These act as inhibitors of the cyclo-oxygenase enzyme system and are formula ted to protect the aspirin-related drug from degradation before reac hing the colon. Used as a single agent, 5-ASA is useful in treating ulcerative proctitis and as maintenance therapy following induction of remission. Corticosteroids have been the mainstay of treatment used either topically or systemically . They have a widespread anti inflammatory action and are frequently used in combination with 5-ASA derivatives to deliver prompt r elief of symptoms. The immunosuppressive drugs azathioprine and ciclosporin can be used to maintain remission and as steroid-sparing agents should maintenance therapy be r equired. Azathioprine is a purine analogue that is metabolised to 6-mercaptopurine (6-MP) and works by inhibiting cell-mediated immune responses. 6-MP may be given dir ectly for the same e ff ects. Approximately 10% of people have deficient thiopurine methyltransferase (TPMT) and 1 in 300 people have no enzyme activity , causing ine ffi cient metabolism of 6-MP . The resulting high pharmacological concentrations may cause adverse e ff ects such as myelosuppression. Testing of TPMT activity should be undertaken before commencing treatment. Short-course intravenous ciclosporin treatment is associated with remission in 80% of patients; however, many patients relapse after completion of treatment. The monoclonal antibodies infliximab and adalimumab both act as antagonists to tumour necrosis factor alpha (TNF α), which has a central role in inflammatory cascades. Infliximab, a murine chimeric monoclonal antibody , was the first av ailable monoclonal antibody for the treatment of CD. It is administered as an intravenous infusion most frequently to induce remission in moderate to severe disease and may be used as maintenance treatment once remission has been achieved. Adalimumab, an entirely human monoclonal anti - body , is an alternative to infliximab that also targets TNF α . It can be self-administered by patients, which is advantageous in long-term maintenance. T rough levels and antibodies to anti - TNF α monoclonal antibodies should be monitored to ensure optimal dosing and e ffi cacy of treatment. Recently , ustekinumab, a monoclonal antibody against interleukin-12/23; vedolizumab and etrolizumab, anti-integrin monoclonal antibodies; tofacitinib, a JAK (Jan us kinase) inhibitor; and ozanimod, an S1P (sphingosine-1-phosphate) - receptor modulator have receiv ed regulatory approval for treatment of IBD. The complexity and best sequencing of treatment options requires multidisciplinary

specialist input and is beyond the remit of this chapter (see Further reading). Medical treatment

Steroids Corticosteroids are widely used to treat acute flares of CD. They induce remission in 70–80% of cases of moderate to severe disease. They should be used in short courses and tapered once a response has been achieved. They reduce inflammation and are therefore ine ff ective in established fibro stenotic disease. Steroid enemas may be used in the rectum, John Leonard Kantor , 1890–1947, gastroenterologist, Presbyterian Hospital, New Y ork, NY , USA, described his string sign in 1934. - where the benefits include reduced systemic bioavailability , although long-term use may still cause adrenal suppression. Oral steroid formulations such as budesonide have been devised, where the steroid moiety is removed in the portal). circulation, thus reducing systemic side e ff ects. Steroids should - not be used as maintenance therapy and are usually replaced with immunomodulatory agents to minimise the risk of side e ff ects associated with long-term steroid use. - Aminosalicylates Colonic symptoms can be treated by 5-ASA agents in a similar - manner to those in UC. These agents have limited e ffi cacy in - small bowel CD. Antibiotics). A Metronidazole and ciprofloxacin may be used, particularly for periods of a few weeks at a time, especially in perianal disease. Long-term use of metronidazole should be avoided as there is a risk of peripheral neuropathy . Ciprofloxacin also has significant side e ff ects when used in the long term, including tendinitis and tendon rupture. Antibiotics may be used to treat an inflammatory mass or an abscess. In general, however, a confirmed abscess should be treated by percutaneous drainage and/or surgery as antibiotics alone will not treat a Crohn’s mass e ff ectively . Immunomodulatory agents Azathioprine is used for its additive and steroid-sparing e ff ects and currently represents standard maintenance therapy . It is a purine analogue, which is metabolised to 6-MP , and works by inhibiting cell-mediated immune responses (see Medical - treatment of ulcerative colitis).

Figure 75.14 Magnetic resonance enteroclysis demonstrating small bowel in /f_l ammation (courtesy of Dr D Kasir, Hope Hospital, Salford, UK).

Short-course intravenous ciclosporin treatment is associated with remission in 80%; however, there is relapse after comple tion of treatment in many cases. Methotrexate is a drug that has a wide e ff ect on DNA synthesis and immune signalling and can also be used in CD, although it is used less frequently in the biological era. Monoclonal antibody (biologic) therapy Infliximab, a murine chimeric anti-TNF α monoclonal antibody , and adalimumab, an entirely human anti-TNF monoclonal antibody , are widely used to induce remission in moderately severe and severe CD. Third-generation monoclo nal antibody therapies vedolizumab and etrolizumab prevent leukocyte migration preferentially in the gastrointestinal tract and may therefore have fewer side e ff ects. More recently ustekinumab has entered widespr ead use as a CD therapy . It targets interleukin-12/23 to dampen the autoimmune system. Monoclonal antibody therapy is currently widely used for induction and maintenance of remission. Early and aggressive use in patients at high risk for early recrudescent disease after surger y (for example, penetrating phenotype, early mucosal inflammation or aphthous ulceration at follow-up colonos copy) may reduce (or at least postpone) the need for subse quent surgery . Perforation and abscess formation are usually regarded as contraindications to the use of biological therapy , although biologicals may be safely used after percutaneous drainage. While biologicals may reduce inflammation and may occasionally achieve healing of fistula openings in anal disease, the fistula tracks may remain patent and cessation of therapy is associated with a high risk of reactivation. Care must be taken before starting biological therapy to ensure that there is no active sepsis and that a diagnosis of intestinal tuberculosis has

been excluded (see Chapter 65).

Nutritional support

Nutritional support

It is essential that nutritional status is evaluated in all patients with IBD. Nutritional support is frequently required. Patients - with moderate nutritional impairment will require nutritional supplementation and severely malnourished patients may - require enteral tube or even intravenous feeding. Anaemia, hypoproteinaemia and electrolyte, vitamin and metabolic bone problems must all be addressed. Nutritional optimisation has been shown to improve surgical outcomes but it is important to recognise that a significant improvement in nutritional status - is very unlikely in the setting of active infection; in patients with abscesses, e ff ective drainage remains the overwhelming priority . Nutritional support

Nutritional support is frequently required in CD. Patients with moderate nutritional impairment will require nutritional supplementation and severely malnourished patients may require enteral tube or even parenteral nutrition. Anaemia, hypoproteinaemia and electrolyte, vitamin and metabolic bone problems must all be addressed. Elemental diet or parenteral nutrition can induce remission in up to 80% of patients, an e ff ect comparable to steroids, but almost all patients relapse rapidly after cessation of therapy . Nutritional optimisation has been shown to improve surgical outcomes, but it is important to recognise that a significant improvement in nutritional status is unlikely in the setting of active infection and, in patients with abscesses, e ff ective drainage remains the overwhelming priority .

Operative treatment

Operative treatment

Emergency In the emergency situation (or for a patient who is malnour - ished or on high-dose steroids), the safest procedure is subtotal colectomy and end-ileostomy . The rectosigmoid remnant may be left long and can either be brought out as a formal mucous fistula or closed just beneath the skin as a subcutaneous mucous fistula (Figure 75.6); alternatively , it can be closed o ff with staples across the upper rectum at the pelvic brim and rectal decompression achieved via a transanal catheter. This operation has the advantage that the patient avoids the risks of pelvic dissection while unwell and that colonic histology can be assessed to distinguish between UC and CD. Restor - ative surgery can be contemplated at a later date when the patient is no longer on steroids and has fully recovered. The mesentery should be divided where convenient and there is no evidence for or against preserva tion of the omentum in the laparoscopic era, when resection or preservation is a matter of surgical convenience. Most surgeons would recommend close dissection for UC and a greater degree of mesocolic resection for CD given the potential role for the mesentery

(b) (a) . The rectal (b) .

divide the sigmoid at a level that will comfortably reach the skin as a mucous fistula unless this part of the bowel is severely diseased, in which case resection at the sacral promontory is the preferred approach. Urgent subtotal colectomy for acute severe colitis can be performed laparoscopically , provided the surgeon and theatre team have adequate experience, with care to av oid perforation when handling friable bowel with laparoscopic instruments. Emergency colectomy for septic complications of acute severe colitis should be carried out in a timely fashion and should not be delayed pending availability of laparoscopic colorectal expertise. Proctectomy is rarely needed in the urgent or emergency situation and should be avoided as pelvic dissection of the diseased rectum is di ffi cult, carries risks to bladder and sex ual function, prolongs the surgery in a critically ill patient, increases the risk of mortality and reduces the potential for later restorative surgery . Fulminant colitis or toxic megacolon can also occur in CD but less frequently than in UC. Without a pre-established diag nosis, distinction is usually not possible unless ther e is clear radiological evidence of small bowel CD or clinically apparent perianal CD. In the urgent setting subtotal colectomy for pan colitis should be performed as for UC, preferably with omen tal resection and a more radical approach to the mesentery . In situations where a diagnosis of colonic CD is established a more tailored segmental r esection may be considered in highly selected patients. Primary anastomosis should be avoided in the acute setting and in immunosuppressed patients. Elective In the elective setting the following operations are available – all of these can be successfully performed laparoscopically in experienced hands: /uni25CF subtotal colectomy and ileostomy (as in an urgent colec tomy); /uni25CF proctocolectomy and permanent end-ileostomy; /uni25CF restorative proctocolectomy with ileal pouch–anal anasto mosis (IPAA); /uni25CF subtotal colectomy and ileorectal anastomosis; /uni25CF segmental colectomy (Crohn’s colitis only).

Segmental resections are not recommended for UC as, even when the right colon is not obviously involved, there is a high recurrence rate in the remaining colon. Segmental colonic resection ma y be considered in selected patients with isolated CD. Subtotal colectomy with ileostomy is performed electively in frail patients, patients who cannot be weaned from steroids and when there is doubt as to the underlying diagnosis. In such situations, restorative surgery or completion proctectomy can be considered at a future date. Complications of CD including fibrotic strictures not amenable to endoscopic dilatation and enteric fistulae are common indications for elective surgery in patients with CD. Patients who have pr eviously undergone emergency resection and stoma formation will also require follow-up for counselling about restoration of bowel continuity . surgery For many patients who require surgical intervention for colitis, the timing of surgery will be a critical part of shared decision making between clinicians and patient. In the elective setting, patients will want to plan surgery around social, educational, family and work commitments to minimise the impact of surgery and postoperative recovery on their lives. As proc - tectomy carries small but recognised risks to sexual function and fertility , patients may choose to defer surgery until after completing their families or consider sperm, oocyte or embryo storage to allow assisted fertility at a later date. Steroid therapy in both UC and Cr ohn’s colitis increases the risk of postoperative complications, although it is di ffi cult to quantify this e ff ect. Patients treated with steroids have an - increased risk of infectious complications and poor healing. It is likely tha t there is a dose-related aspect to this phenome - non. In view of this, steroid use should be reduced as much as possible prior to surgery , preferably below 10 /uni00A0 mg prednisolone , per day , particularly if an anastomosis is planned. Both anti - - TNF α and anti-integrin biological therapies also increase the risk of postoperative complications and should be discontinued wherever possible between 14 and 30 days prior to surgery . - - Venous thromboembolism prophylaxis Patients with IBD have a threefold increased risk of venous thromboembolism compared with the general population and this risk increases in patients who require surgery . The rate of thromboembolic events after surgery for IBD is around 3%, with the strongest predictors of thromboembolic compli - cations being stoma formation, preoperative steroid therapy , ileoanal pouch formation and increased length of stay . The risk of venous thromboembolism is higher in patients with UC than in those with CD. Because of the increased risk of v enous thromboembolism, extended chemoprophylaxis has been recommended with low-molecular-weight heparin used - for up to 28 days after any abdominal procedure for IBD. Panproctocolectomy and ileostomy - This operation removes the entire colon and rectum and, by doing so, removes any risk of colorectal neoplasia or colitic symptoms; it results in a permanent ileostomy . It has a lower complication rate than an ileal pouch procedure, although the perineal wound can be problematic (10% fail to heal) and stoma problems are common. It is indicated for patients who are not candidates for restorative surgery owing to impaired anal sphincter function, comorbidities or patient preference. The colectomy is performed as above. In UC, provided there is no concern regarding rectal cancer, a close rectal dissection may be performed to minimise damage to the pelvic nerves, avoid - ing erectile and bladder dysfunction. Recent evidence suggests that the mesorectum should be excised when proctectomy is performed in CD as the mesentery itself may be involved in the inflammator y process and delay perineal healing. In UC without dysplasia or cancer present, an intersphinc - teric dissection of the anal canal should be performed. This results in a smaller perineal wound and fewer healing prob - lems. In CD, wider excision of the anal canal and diseased permanent end-ileostomy is formed. The position of the ileos tomy should be carefully sited preoperatively with the expert guidance of a stoma nurse specialist. Restorative proctocolectomy with ileal pouch– anal anastomosis Although restoration of bowel continuity by ileoanal anas tomosis was first performed

by Nissen in 1933 and later by Ravitch and Sabiston, the functional outcomes were poor and the operation was rarely performed. The combination of improved surgical techniques, better under standing of the physiology of faecal continence and the relative success of the continent ileostomy operation (Kock pouch) led Parks and Nicholls in the 1970s to reintroduce the concept of IPAA first promulgated by Bacon in the 1950s. Parks and Nicholls devised an ‘S’ pouch and later a ‘W’ pouch configuration; however, these have been generally superseded by the ‘J’ pouch described by Utsunomiya, which is technically easier to construct and avoids a potentially obstructing e ff erent limb from the pouch reservoir (Figure 75.7). Early pouch surgery included dissection of the rectal mus cularis propria (mucosal proctectomy) but it is now clear that continence is better if the mucosa immediately above the den tate line (anal transitional zone) is preserved. A distal mucosec tomy to the upper anal canal with anastomosis at the dentate line is now reserv ed for patients with rectal mucosal dysplasia and selectiv ely for patients in whom the operation is performed for familial adenomatous polyposis (FAP) (see Chapter 77 Usually the anastomosis is double-stapled to the top of the anal canal, preserving the upper anal mucosa (Figure 75.8 although a hand-sewn pull-through anastomosis is also pos sible. Care must be taken to ensure that the anastomosis is to the anal canal and not the distal rectum as residual inflamed mucosa behind may cause persistent symptoms, so-called cu ffi tis. IPAA is usually performed as a two-stage procedure with a covering loop ileostomy that ma y be closed at an interval once pouch healing has been confirmed, usually by means of a Gastrografin (water soluble) contrast enema radiograph. In patients who ha ve previously undergone an urgent colectomy or those with IC in whom a colectomy had provided a defini tive diagnosis of UC, the operation is considered to have been a three-stage procedure. In highly selected individuals whose operation is elective and immunosuppressive medication has been discontinued a one-stage operation without ileostomy may be considered. The modified tw o-stage approach of initial subtotal colectomy and end-ileostomy followed by proctectomy with pouch formation and without diversion is the standard of practice in many specialist centres. Rudolph Nissen , 1896–1981, surgeon, Istanbul, Turkey , later Jewish Hospital, New Y ork, NY , USA, and University of Basel, Switzerland. Mark Mitchell Ravitch , 1911–1989, surgeon, Montefiore Hospital, Pittsburgh, PA, USA. David Sabiston , 1925–2009, surgeon, Duke University , Durham, NC, USA. Nils G Kock , 1924–2011, Professor of Surgery , University of Gothenburg, Sweden. Sir Alan Guyatt Parks , 1920–1982, surgeon, St Mark’s Hospital, London, UK. Ralph John Nicholls , b. 1943, surgeon, St Mark’s Hospital, London, UK. Harry Ellicott Bacon , 1900–1981, surgeon, Temple University , Philadelphia, PA, USA. Joyi Utsunomiya , surgeon, Hyogo College of Medicine, Hyogo, Japan. - - 15 cm (c) - - -).), - Postoperative complications include pelvic infection (usu - ally resulting from a leak at the ileoanal anastomosis or, in a ‘J’ pouch, from the top of the ‘J’), postoperative small bowel - obstruction (which may occur in as many as 10–15% of patients) and pouch–vaginal fistula. The frequency of evacuation is determined by pouch vol - ume, completeness of emptying, reservoir inflammation and intrinsic small bowel motility , but is typically between three and eight evacuations in each 24-hour period, of which at least one evacuation is nocturnal. Stool frequency , urgency and minor faecal incontinence are common, but usually reduce with time

Figure 75.7 Ileoanal anastomosis with a pouch. A substitute rectum is made from joined folds of ileum to form an expanded pouch of small intestine. The pouch is then joined directly to the anus at the level of the dentate line, all other rectal mucosa having been removed. Three ways of forming a pouch are illustrated: (a) a simple reversed ‘J’; (b) an ‘S’ pouch; (c) a ‘W’ pouch.

as ileal pouch capacity increases. The majority of patients with IPAA have a very good quality of life. The main reasons for pouch failure are pelvic infection, poor functional outcome and pouchitis (see below). Follow-up of patients with IPAA shows that, although the functional outcome may deteriorate with ageing, between 85% and 90% of patients retain their IPAA in the long term. Women of reproductive age should be advised of poten tially reduced fertility , as well as vaginal dryness, owing to denervation of the secretory glands of the vaginal mucosa. Laparoscopic or robotic techniques may reduce this e ff ect; how ever, women who have not completed their family may elect for a colectomy with ileostomy and IPAA at a later date. Pouchitis is inflammation of the ileal pouch mucosa that occurs to varying degrees in up to 50% of patients who undergo IPAA for UC. Interestingly , pouchitis is exceeding rare after IPAA for FAP , suggesting that there is an inher ent enteric mucosal proinflammatory response to an altered gut-associated microbiome following IPAA for UC. Pouchitis usually responds to a short course of antibiotic therapy , notably with metronidazole or cipr ofloxacin, and can be followed by maintenance with probiotics. In a small percentage of patients (3–5%), pouchitis is recurrent or persistent such that pouch excision may be necessary . In such cases, previously undiag nosed CD and pouch ischaemia should be considered as alter native diagnoses. Giovanni Battista Morgagni , 1682–1771, Professor of Anatomy , Padua, Italy . Antoni Le´ sniowski , 1867–1940, Professor of Surgery , Warsaw University , Warsaw , Poland. Thomas Kennedy Dalziel , 1861–1924, surgeon, Western Infirmary , Glasgow , UK. Leon Ginzburg , 1989–1988, surgeon, Mount Sinai Hospital, New Y ork, NY , USA. Gordon D Oppenheimer , 1900–1974, surgeon, Mount Sinai Hospital, New Y ork, NY , USA. The Kock pouch was originally designed as a continent uros - tomy but later adapted as a continent ileostomy for patients following proctocolectomy for IBD. The technique confirmed the safety of a small bowel reservoir, but di ffi culties with prolapse of the nipple valve mechanism required for continence and the success of IPAA as a mechanism to retain continence and anatomical continuity has meant that the operation is now rarely performed. Colectomy and ileorectal anastomosis This procedure is occasionally performed in UC if there is minimal rectal inflammation. A very considerable percentage (at least 50%) of patients with a quiescent rectum after total colectomy will develop significant mucosal inflammation in the rectum once the faecal stream has been re-established. Although rectal inflammation can be controlled with medical treatment, functional results may be disappointing. If the rectum is preserved, then annual rectal inspection is advocated. This procedure has the advantage of avoiding a stoma and the risk to sexual function associated with rectal dissection, and so may provide a useful transition in highly selected patients.

Figure 75.8 Stapled ‘J’ pouch with the stapler creating an ileal pouch– anal anastomosis

Pathology

Pathology

The terminal ileum is the most commonly a ff ected segment of bowel in patients with CD, often occurring in combination with other areas of disease. More proximal small bowel is less frequently involved. Colitis alone occurs in up to one-third of cases, the stomach and duodenum are a ff ected in around 5% of cases, but perianal lesions are common, a ff ecting up to 50% of patients. Perianal disease occurs in 25% of patients with small bowel disease and in 75% of patients with Crohn’s colitis. - Macroscopically CD is characterised by fibrotic thickening of the intestinal wall with narrowing (stricturing) of the lumen - and fat wrapping (encroachment of mesenteric fat around the bowel) (Figure 75.9). Ther e is usually dilated bowel just prox - imal to the stricture and deep mucosal ulcerations with linear or serpiginous (snake-like) patterns in the strictured area itself. Oedema between ulcers gives rise to a characteristic cobble - stone appearance of the mucosa (Figure 75.10). The trans - - mural inflammation (a pathognomonic feature of CD) may lead to segments of bowel becoming adherent to each other and to surrounding structures, for ming inflammatory masses - with mesenteric abscesses and fistulation into adjacent organs (Figure 75.11). The serosa is usually opaque, with thickening of the mesentery and enlarged mesenteric lymph nodes. CD is characteristically discontinuous, with inflamed areas separated - by apparently normal intestine, so-called skip lesions. Microscopically focal areas of chronic inflammation involving all layers of the intestinal wall with lymphoid aggre - gates are characteristic of CD. Non-caseating giant cell g ran - ulomas found in 60% of patients are pathognomonic of CD (Figure 75.2). They are most commonly seen in anorectal ming disease. Multifocal arterial occlusions are found in thickened muscularis propria. There may be nerve cell h yperplasia and deep, fissuring ulceration within a ff ected areas. Characteris - tically , and unlike in UC, there may be completely normal areas immediately next to areas of severe inflammation.

Figure 75.9 Crohn’s disease of the ileocaecal region showing typical thickening of the wall of the terminal ileum with encroachment of mesenteric fat. Figure 75.10 Crohn’s disease of the terminal ileum illustrating longitu dinal ulceration and cobblestone mucosa.

Perianal Crohn’s disease

Perianal Crohn’s disease

Perianal CD is distressing and often debilitating for patients. The most common presentation is with a perianal abscess: perianal swelling, redness and pain, followed by discharge of pus or faecal drainage to perianal skin or vagina, representing To r u K o n o , 1955–2021, Sapporo Higashi Tokushukai Hospital, Higahi-ku, Sapporo, Hokkaido, Japan. - a fistulous connection. Management requires a combination - of medical and surgical treatments. The role of surgery is to control infection in the first instance, and later to minimise recurrent infection, r educe drainage and to o ff er potential for fistula cure. If a fistula is seen at the time of abscess drainage, a seton may be placed. Otherwise, further examination under anaesthesia will be required for placement of draining seton(s) - by an experienced colorectal surgeon. MRI may aid identification of occult fistulae or sources of ongoing sepsis. Long-term drainage with setons prevents - further tissue loss from undrained infection but also allo ws safe initiation of biological therapy . Infliximab or adalimumab therapy may be combined with seton insertion in the early phase of management of perianal fistulae. Once fistula dis - charge has reduced, typically after two or three doses, the seton can be removed. Laying open of fistulae (fistulotomy), com - monly performed for fistulae resulting from the more common cryptoglandular perianal abscess, should generally be av oided in CD as the wound edges heal poorly . Potentially curative surgical options include advancement flaps, fibrin glue, fistula plugs, lig ation of the intersphincteric coupled with sutured closure of the internal fistula opening. ® The over-the-scope clip (OTSC) and video-assisted anal fis tula treatment (V AAFT) have only been used in small numbers of patients (see Chapter 80). Injection of adipose-derived mesenchymal stem cells into tissue surrounding complex anal fistula tracts is well tolerated and when used in combination with established treatments may increase fistula healing rates. The mechanisms of action are uncertain but are thought to relate to regenerative and anti-inflammatory cytokines produced by stem cells. The treat ment is expensive and further trials are needed. A diverting stoma may o ff er significant quality of life benefit in selected patients and should be o ff ered to symptomatic patients in the presence of intractable symptomatic perianal disease or proctitis, or failure to control perianal sepsis. Proctectomy is a good option for some patients and a permanent stoma should not be viewed as a treatment failure as it may again o ff er significant improvement in quality of life in selected patients. Rectovaginal fistulae hardly ever close with medical management alone, and surgery to repair rectovaginal fistulae has relatively low success rates. Failure of surgical repair may result in further deterioration in symptoms if there is additional loss of functional anorectal, vaginal or perineal tissue, and ultimately stoma rates are high in this group of patients.

Radiology

Radiology

A plain abdominal film may indicate the severity of disease in the acute setting and is particularly valuable in demonstrating May o score named after the Mayo Clinic, R ochester MN, USA. been replaced by CT , although a contrast study will show a featureless colon. CT findings in pancolitis may show signif - icant thickening of the colonic wall, as well as inflammator y stranding in the colonic mesentery (Figure 75.5).

TABLE 75.2 Scoring system for assessment of ulcerative colitis activity. Finding Stool frequency Sub- Rectal bleeding score Normal 0 None 1 or 2 more than 1 Streaks of blood <50% normal of the time 3 or 4 more than 2 Obvious blood >50% of normal the time 5+ more than 3 normal Blood alone passed Adapted from Schroeder KW, Tremaine WJ, Ilstrup DM. Coated oral 5-aminosalicylic acid therapy for mildly to moderately active ulcerative colitis. N Engl J Med 1987; 317 (26): 1625–9.

SURGERY

SURGERY

Many general surgeons have relatively little experience in managing patients with IBD. High-volume centres have lower morbidity and mortality rates after colectomy for emergency surgery for IBD and after primary ileocaecal resection for CD. Specialist units also have a lower failure rate following IPAA and are more likely to o ff er subsequent restorative surgery , - rather than permanent stoma, for patients who have required emergency colectomy . Less common aspects of IBD surgery , including the need for revision or excision pouch surgery , rectov aginal fistula management, Kock pouch formation or care of adolescent patients, require specialist expertise to achieve good outcomes.

TREATMENT

TREATMENT

E ff ective treatment of UC requires a multidisciplinary approach to management. Members of the IBD multidisciplinary team - typically include specialists in IBD gastroenterology , colorectal surgery , IBD nursing, stoma therapy , gastrointestinal and interventional radiology , pathology , dieticians and nutritional - support services, clinical psychologist and other specialties according to the individual patient’s need.); Summary box 75.1 Principles of management of ulcerative colitis /uni25CF /uni25CF /uni25CF /uni25CF

Most patients are maintained on optimised medical therapy Acute severe colitis (ASC) requires multidisciplinary management Toxic dilatation or impending complication should be suspected if the patient /uni00A0 develops abdominal tenderness or distension, or deteriorates clinically Patients with colitis are at increased risk of developing cancer; those with pancolitis of long duration are most at risk Sub- Global Sub- Sub- Disease activity score assessment score score on /f_l exible sigmoidoscopy 0 Normal 0 Normal 0 1 Mild 1 Mild 1 2 Moderate 2 Moderate 2 3 Severe 3 Severe 3

Figure 75.5 Computed tomography scan demonstrating colitis with a thickened colonic wall and in /f_l ammatory stranding in the mesentery (courtesy of Dr D Kasir, Hope Hospital, Salford, UK).