15.19 Miscellaneous disorders of the bowel 3025

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ESSENTIALS A wide range of miscellaneous disorders can affect the bowel. Those discussed in this chapter include cystic disorders, protein-losing enteropathy, vascular disorders of the intestine, intestinal pseudo- obstruction, various disorders of the colon and rectum (including microscopic, collagenous and lymphocytic colitis, solitary rectal ulcer syndrome), peritoneal disorders, and endometriosis. Cystic disorders of the bowel Colitis cystica profunda First described by Stark in 1766 and then by Virchow as colitis cystica polyposa in 1863, the disorder is characterized by submucosal mucin-filled cysts. They may be single or multiple, within 12 cm of the anal verge, and are more common in younger men. It may represent a subgroup of the solitary rectal ulcer/rectal prolapse syn- drome but has also been associated with Crohn's disease. The cysts are seen at colonoscopy as a submucosal mass covered by normal rectal mucosa that may occasionally be hyperaemic, polypoid, or ul- cerated. Diagnosis can be made with transrectal ultrasound, MRI, or colonoscopy, as it is important to exclude malignancy. Treatment is with bulking agents and laxative, re-education to avoid straining at stool, and surgery only if there is associated rectal prolapse. Pneumatosis cystoides intestinalis Gas-filled cysts within the small or large bowel are rare and can de- velop in a wide range of conditions. Some are primary, asymptom- atic, often in the left colon, and with no apparent cause. Others are secondary, involve the ileum and right colon, and can be associated with chronic obstructive pulmonary disease, intestinal obstruction, severe colonic inflammation (pseudomembranous colitis, necro- tizing enterocolitis), connective tissue disease (systemic sclerosis, mixed connective tissue disease), amyloidosis, endoscopy, or CT colography. Pneumatosis cystoides intestinalis has recently been described in patients receiving α-glucosidase inhibitors. The sub- mucosal or subserosal cysts are lined by histiocytes and giant cells and, although easy to diagnose on resection, specimens can be dif- ficult with biopsies. Symptoms, where present, may include diarrhoea, vague abdom- inal discomfort, blood per rectum, and weight loss. The air-filled spaces may be seen on abdominal films, but CT is best to diagnose them (Fig. 15.19.1). They appear as submucosal masses on colonos- copy. Rarely, portal venous gas can also be visualized, which implies associated bowel infarction. In some primary cases, a conservative approach is possible, but when symptomatic treatment is with high-flow oxygen therapy (55–75% O_2), aiming for a Pao_2 greater than 200 mmHg for 4 to 10 days or, avoiding

oxygen toxicity, with hyperbaric oxygen. If colonic integrity is compromised, or there is evidence of systemic sepsis or bowel perforation, broad-spectrum antibiotics and sur- gery are required. 15.19 Miscellaneous disorders of the bowel Alexander Gimson Fig. 15.19.1 CT image showing linear pneumatosis intestinalis (arrows) in the ascending and descending colon. From Levy AD, Mortele KJ, Yeh BM (eds) (2015). Gastrointestinal imaging. By permission of Oxford University Press.

section 15 Gastroenterological disorders 3026 Protein-losing enteropathy This is a syndrome due to excessive loss of protein from the gastrointestinal tract. It should be considered in any case where hypoproteinaemia or a low albumin cannot be explained by renal loss (nephritic syndrome) or reduced hepatic synthesis. The cardinal features are peripheral oedema, occasionally diarrhoea and weight loss. There is a low albumin (occasional falling to very low levels, <15 g/dl), and reduced immunoglobulins, caeruloplasmin, and fibrinogen. Gastrointestinal protein loss may be due to a wide range of causes (Box 15.19.1). Increased interstitial pressure within the intestine can lead to protein loss due to lymphangiectasia (Waldmann's disease, lymphoedema–lymphangiectasia–intellectual disability, Hennekam's syndrome), chronic lymphatic obstruction due to tuberculosis, sarcoidosis, lymphoma, retroperitoneal fibrosis, or in association with an elevated right-sided heart pressure (con- strictive pericarditis, following Fontan's procedure). Various ul- cerative disorders of the gastrointestinal tract include severe erosive gastritis, Crohn's disease, pseudomembranous colitis, and acute graft-versus-host disease. Finally, it has been associated with Ménétrier's disease, bacterial overgrowth of the small bowel, Whipple's disease, eosinophilic gastroenteritis, coeliac disease, and tropical sprue. A number of radioisotopes have been used for diagnosis, with 51Cr-labelled albumen being most commonly used. Stool α1-antitrypsin levels are also used, as this protein is not broken down within the gut. Treatment should be aimed at raising the serum albumin level and management for each specific cause of the protein loss. Miscellaneous vascular disorders of the intestine Spontaneous intramural haemorrhage Spontaneous bleeding into the bowel wall may occur following trauma; during excessive anticoagulation with warfarin; in patients with coagulation disorders, particularly haemophilia; and in vascu- litis. It may present as pain, symptoms of partial intestinal obstruc- tion, intussusception, and rarely intestinal haemorrhage. The main differential diagnosis is with acute mesenteric ischaemia. CT may not be able to distinguish between these two diagnoses although intramural haemorrhage is more commonly associated with pro- longed INR. Treatment is usually conservative with correction of the coagulation deficit and transfusion. Aortoenteric fistulas Aortoenteric fistulas are rare but serious conditions that may arise as a complication following abdominal aortic surgery or rarely spon- taneously. Clinical symptoms range from occult, recurrent gastro- intestinal bleeding and intermittent, unexplained fever attacks to dramatic, massive intestinal blood loss with shock. The fistula is usu- ally in the second or third part of the duodenum and may be diag- nosed by CT with contrast or angiography (Fig. 15.19.2). Treatment is by surgery although recently endoluminal aortic stents have been successfully used. Mortality remains high. Intestinal pseudo-obstruction Acute colonic pseudo-obstruction Acute massive dilatation of the caecum and right colon, sometimes extending into the transverse and left side of the colon, can occur following intra-abdominal surgery for any cause as well as in any critically ill patient with severe sepsis, or respiratory or cardiac dis- ease. In Ogilvie's original report, two patients had retroperitoneal malignancy, currently an exceptionally rare cause for this syndrome. Most patients have constant dull pain with marked abdominal distension associated with vomiting. There is constipation, but many patients continue to pass wind and some occasionally have diarrhoea despite the colonic dilatation. Bowel sounds are variable in pitch and frequency but are absent only

rarely. The diagnosis is made on a plain radiograph of the abdomen, which can be undertaken to monitor the risk of colonic perforation— the main risk from this disorder. The differential diagnosis includes toxic megacolon (a complication of inflammatory bowel disease or Clostridium difficile infection), caecal volvulus (Fig. 15.19.3), and mechanical colonic obstruction. Treatment is with intravenous fluids and electrolytes, together with nasogastric suction, and any drugs that might be implicated in reduced colonic motility (e.g. opioids, tricyclic antidepressants, or anticholinergic agents) should be stopped. Pharmacological stimulation has been recommended with neostigmine (an acetyl- cholinesterase inhibitor), and a meta-analysis of trials has been positive. Decompression of the colon with a rectal tube or with colonoscopy is occasionally needed, although the long-term value has been contested. Very rarely, surgical decompression with a caecostomy may be warranted if the colon is more than 12 cm in Box 15.19.1 Causes of a protein-losing enteropathy Inflammatory conditions • Inflammatory bowel disease—Crohn's disease • Gastric cancer • Intestinal lymphoma • α-Chain disease Lymphatic obstruction • Intestinal lymphangiectasia • Right-sided heart failure • Congestive cardiac failure • Constrictive pericarditis • Fontan procedure for single ventricle • Hepatic venous outflow obstruction • Mesenteric tuberculosis or sarcoidosis • Intestinal lymphoma Increased permeability without ulceration • Coeliac disease • Tropical sprue • Ménétrier's disease • Amyloidosis • Bacterial overgrowth of small bowel • Connective tissue diseases • Allergic gastroenteropathy • Eosinophilic gastroenteropathy

15.19 Miscellaneous disorders of the bowel 3027 diameter, and may be accompanied by resection if there is evi- dence of obvious colonic ischaemia. Chronic intestinal pseudo-obstruction This is a rare syndrome associated with symptoms and signs sug- gesting mechanical obstruction of the large or small bowel in the absence of any obstructive lesion. A similar disorder of the intes- tine but without features of obstruction or bowel dilatation has been termed 'chronic intestinal dysmotility'. The main features are of nausea, repeated vomiting, and ab- dominal pain. There may be significant bowel distension and constipation or occasionally diarrhoea. Bowel sounds are usually hyperactive. There are a number of causes (Box 15.19.2) which include familial visceral neuropathies and myopathies, which may present in infancy or adulthood; collagen vascular disorders; neuromuscular disorders and endocrinopathies; infections; and some drugs. The diagnosis requires features of colonic or small-bowel dila- tation and may require specific electrophysiological studies or full-thickness bowel biopsy at laparotomy. Treatment is directed at the underlying disease, or the use of prokinetic agents. Rarely, surgery may be needed for isolated sections of affected bowel, or substantial sections if symptoms are severe and chronic. Some cases have done well following small-bowel transplantation. Fig. 15.19.2 Aortoenteric fistula in a patient with an aortobifemoral graft who was admitted with fever and upper gastrointestinal bleeding. The arterial phase of intravenous contrast enhancement shows extravasation of contrast material from the aorta into the duodenum (arrows). Extensive soft tissue surrounds the aorta. At surgery, a mycotic aneurysm was found. From Levy AD, Mortele KJ, Yeh BM (eds) (2015). Gastrointestinal imaging. By permission of Oxford University Press. Fig. 15.19.3 Plain abdominal X-ray showing a prominent focal loop of air-distended large bowel with its axis extending from the right lower quadrant to the left upper quadrant in a case of caecal volvulus. From Abujudeh HH (ed) (2014). Emergency radiology cases. By permission of Oxford University Press.

Microscopic colitis This syndrome is characterized by the triad of watery diarrhoea, a normal

macroscopic colonoscopy, and specific histology showing either lymphocytic colitis or collagenous colitis. Although usually considered together as microscopic colitis, there are some distinct epidemiological, histological, and therapeutic differences between the two types. There is an annual incidence rate of 10/100 000 with lymphocytic colitis being marginally the most common. It is five times more common over the age of 65 years and in women. There have been associations with coeliac disease, hypothyroidism, a family history of inflammatory bowel disease, and more recently drugs including selective serotonin reuptake inhibitors, H2 antagon- ists, and nonsteroidal anti-inflammatory drugs. Collagenous colitis This was first recognized by Lindström in 1976. Patients, mostly women, usually present in the fifth and sixth decade, but the disease can occur in young adults as well as in older people. Watery diar- rhoea accompanied by occasional abdominal cramps, wind, disten- sion, and some nausea are usual. Diarrhoea can be severe and may seem secretory in nature. There may be some mucus, but bleeding per rectum does not occur. Despite such severe symptoms the pa- tients look well, with a good appetite, and they do not lose weight. There are no abnormal physical signs and on colonoscopy the mucosa looks normal, although it may seem somewhat granular and hyperaemic. Such endoscopic changes can occur throughout the colon but are usually patchy and never severe. The diagnosis is made on the appearance of the biopsy, where there is a thickened band of subepithelial collagen extending 15 μm compared with a normal thickness of 2 to 6 μm. The collagen band is widest in the right colon and tends to become thinner more distally. Immunohistochemical studies have shown that the abnormal tissue consists predominantly of collagen type 3, and there is a patchy variable inflammatory infil- trate in the lamina propria consisting of lymphocytes, plasma cells, and some neutrophils. The disease is confined to the colon and is distinct from collagenous sprue. Regarding treatment, a Cochrane review in 2017 found low- quality evidence suggesting that budesonide may be effective for inducing and maintaining clinical and histological responses, but concluded that bismuth subsalicylate, Boswellia serrata extract, mesalazine with or without cholestyramine, prednisolone, and pro- biotics required further study. Lymphocytic colitis The clinical symptoms are similar to collagenous colitis but the mucosa always looks normal at colonoscopy. Histological examin- ation shows a diffuse inflammatory cell infiltrate throughout the lamina propria with no architectural changes to the glands. The infiltrate is predominantly lymphocytes but there may also be eo- sinophils and a characteristic feature is the marked increase in intraepithelial lymphocytes, which clearly distinguishes it from ul- cerative colitis where they are normal or reduced. In some cases of microscopic colitis there may be spontaneous remissions and symptoms may have been preceded by some infec- tious trigger, including Campylobacter jejuni, Clostridium difficile, or yersinia infection. In cases that do not resolve, treatment is now more rational as recent meta-analyses have demonstrated signifi- cant improvement with budesonide, which is now generally used as first-line therapy, although there are also reports of improvements with mesalazine, cholestyramine, bismuth, or just simply with loperamide. Malakoplakia This is a rare, chronic granulomatous condition, most commonly affecting the genitourinary tract, skin, lung, bone, or brain; within the gastrointestinal tract it is most common in the sigmoid colon or rectum. It is observed in two clusters: in children and older people. It is more common in diabetic, immunosuppressed, or immunocom- promised patients, including those with hypogammaglobulinaemia, HIV infection, or after organ transplantation. Yellowish soft plaques 1 to 20 mm in diameter show a histiocytic infiltrate with eosino- phils and characteristic basophilic, laminated, calcium-containing Michaelis–Guttman bodies. In the bowel, it may occur with isolated rectosigmoid involve- ment, as diffuse colonic involvement, or as a focal lesion associated with a polyp or cancer. It is usually considered to be a granuloma- tous reaction to a chronic

infection: Escherichia coli, klebsiella, and proteus have been implicated. Treatment is with antibiotic therapy (quinolone and co-trimoxazole–trimethoprim) and by minimizing immunosuppression. Solitary rectal ulcer syndrome The solitary rectal ulcer syndrome is somewhat misnamed as it may occasionally occur above the rectum and be multiple or circumfer- ential. It occurs across the age spectrum and is seen into the ninth decade. The ulcer may be at one end of the spectrum of clinical dis- orders associated with rectal mucosal prolapse and is caused in most cases by mucosal ischaemia and infarction. Presentation is with blood per rectum in 90% of cases, and less frequently with abdominal pain, mucus per rectum, straining at defecation, diarrhoea, and constipation. Patients are commonly an- aemic, and the symptoms have a serious impact on the quality of life. The ulcers may be located anteriorly (70%), posteriorly, or cir- cumferentially, and are multiple in one-third of cases. At colonos- copy, the ulcer may be surrounded by a minimal area of inflamed mucosa, or it may be at the end of a polypoid lesion simulating a carcinoma. Biopsy is crucial to rule out that diagnosis. Histology Box 15.19.2 Causes of chronic intestinal pseudo-obstruction • Familial visceral myopathy • Familial visceral neuropathy • Paraneoplastic neuropathy • Scleroderma • Dermatomyositis/polymyositis • Mixed connective tissue disease • Diabetic neuropathy • Spinal cord injury • Neurofibromatosis • Myotonic dystrophy • Amyloidosis • Hypothyroidism • Hypoparathyroidism

 usually shows evidence of ischaemia, but the characteristic feature is hypertrophy of the muscularis mucosae with smooth muscle fibres extending between the crypts and down into the epithelium. Treatment is commonly difficult but should be centred on cor- rection of constipation with bulking agents (with or without lactu- lose), and patients should be warned not to strain at stool. Topical treatments with 5-aminosalicylic acid or corticosteroids have been helpful in small series, but as these ulcers can remit spontaneously, it is difficult to be sure whether treatment has been effective in an individual patient. For patients with continuing disabling symp- toms, anorectal physiological measurements should be considered because there may be evidence of impaired pelvic floor muscle in- novation. A defecating proctogram may determine whether the ano- rectal angle changes when the patient attempts to empty the rectum and record the degree of mucosal prolapse. Surgical therapy with a rectopexy may be helpful in some cases. Stercoral ulcers These occur in association with faecal impaction and are most commonly found in the rectosigmoid area. The patients are usu- ally elderly, but these ulcers can occur at any age in severely con- stipated individuals, including patients with a neurological cause for constipation. The common symptoms are those associated with constipation—nausea, abdominal distension, pain, and anorexia. The ulcers are frequently asymptomatic but may be the cause of an- aemia from chronic bowel loss. The differential diagnosis includes other ulcers within the colon, particularly those with an infectious cause (tuberculosis and amoebiasis) as well as malignancy. Isolated ulcers of the large intestine not associated with underlying colitis are rare but may be an incidental finding on screening col- onoscopy or present with abdominal pain, acute blood per rectum bleeding, or chronic gastrointestinal blood loss. A common cause, particularly when the ulcers are caecal or right sided, is the use of nonsteroidal anti-inflammatory drugs. Complications of parenteral nutrition and intestinal failure A number of complications of parenteral nutrition have been de- scribed relating to vascular thrombosis and catheter-related sepsis, but metabolic complications and the development of a cholestatic liver disease are the most important. Metabolic dysfunction includes hyperglycaemia, dyslipidaemia, manganese toxicity, oxalate renal stones, osteoporosis, and a refeeding syndrome which includes hypophosphataemia, hypernatraemia, and hypokalaemia

shortly after starting nutrition in a malnourished patient. Hepatobiliary disease includes cholelithiasis and a progressive cholestasis resulting in liver failure. This progressive liver disease is more common in children with intestinal failure (due, for instance, to necrotizing enterocolitis) but may also occur in adults. In larger cohort studies, about 25% of cases receiving total parenteral nutri- tion will have significantly abnormal liver blood tests with up to 5% showing evidence of fibrosis leading to cirrhosis. The liver dis- ease may be driven by the total parenteral nutrition itself and result from nutrient excess, deficiency, or toxicity, and is suggested by the dramatic improvements in liver function that can occur with ma- nipulation of the contents of the nutrition support. On the other hand, it may also be related to the accompanying bowel resection. Bacterial overgrowth, increased permeability of the bowel wall due to intestinal atrophy, gut-derived endotoxins, and lithocholic acid with a reduced circulating bile salt pool and bile flow promoting cholestasis have all been suggested. The development of a similar liver disease in patients following a jejunoileal bypass and other forms of bariatric surgery and the fact that liver dysfunction is less common in patients with an intact colon or who can maintain small amounts of enteral feeding are evidence in favour of the gut being a major driver of the liver pathology. Management of these cases should be centralized in intestinal failure units experienced in the complex management of nutrition support and scrupulous catheter care. A careful balance in lipid composition, where both too much and too little must be avoided as well as too much carbohydrate, is important. Cyclical feeding and wherever possible maintaining at least some enteral nutrition are recommended. Ursodeoxycholic acid, as a choleretic, has been shown to prevent liver dysfunction and antibiotics to prevent bac- terial overgrowth in children but there is less evidence of their ef- ficacy in adults. Supplementation with choline and taurine are also important. Bowel-lengthening surgical techniques in children are still unproven but there is increasing evidence of the benefit of trans- plantation of the small bowel (with or without a liver) and 50% 5- year survival is now being recorded. Disorders of the peritoneum A number of rare disorders can specifically affect the peritoneum and serosal surfaces of the large and small bowel (Box 15.19.3). Their importance is firstly as a differential diagnosis for diffuse ma- lignant infiltration of the peritoneum, by far the commonest cause of widespread peritoneal deposits seen on cross-sectional imaging, but also because they may require specific therapy. Disseminated malignancy is common, with ovarian and adeno- carcinoma most prevalent. Patients present with abdominal swelling, ascites, pain, and weight loss. CT scanning will reveal peritoneal deposits and biopsy is mandatory in order to tailor chemotherapy to specific cancers (Fig. 15.19.4). Primary peritoneal mesothelioma presents in a similar manner with a slightly better Box 15.19.3 Diffuse disorders of the peritoneum • Malignancy: — Primary: mesothelioma, leiomyosarcoma, solitary fibrous tumour — Secondary: ovary, stomach, colon, kidney — Pseudomyxoma peritonei — Desmoid tumours • Erdheim–Chester disease • Sarcoidosis • Amyloidosis • Tuberculosis • Retractile mesenteritis • Leiomyomatosis peritonealis disseminate

 prognosis. A clue to synchronous peritoneal carcinomatosis may be an elevated level of CA19-9. It is associated with poor survival and reduced quality of life. The benefits of cytoreductive surgery and hyperthermic intraperitoneal chemotherapy in patients with disseminated ovarian cancer, gastric cancer, and peritoneal meso- thelioma remain unproven. Desmoid tumours (aggressive fibromatosis) are rare benign neoplasms of fibroblastic origin that can be either extra- or intra- abdominal (mesenteric fibromatosis). They are locally invasive, with high recurrence rates. It occurs as a sporadic form and is associated with familial neoplastic syndromes including Gardner’s syndrome and familial adenomatous polyposis

(FAP). Sporadic cases may have mutations in the adenomatous polyposis coli (APC) or β-catenin (CTNNB1) genes. In FAP, tumours carry biallelic APC mutations. Overall, desmoids can occur in up to 15% of FAP cases rising to 65% after abdominal surgery in those with 3′ APC mutations. They are a leading cause of death after colectomy. Symptoms include pain, fea- tures of intestinal obstruction, and often a palpable mass. Treatment remains unsatisfactory and includes surgery, nonsteroidal anti- inflammatory drugs, and tamoxifen. Pseudomyxoma peritonei has been linked to peritoneal spread of appendiceal and ovarian mucinous tumours (Fig. 15.19.5). Erdheim–Chester disease is a multisystem xanthomatosis with histiocytic proliferation similar to Langerhans cell histiocytosis but with a different immunohistochemical profile. Mutations in the BRAF proto-oncogene occur in the majority of cases. Sheets of foamy histiocytes can involve lung, skin, brain, adrenals, renal tract, liver, and peritoneum. Treatment is unsatisfactory but pegylated interferon-α is recommended as first-line therapy. The syndrome of retractile mesenteritis (sometimes referred to as sclerosing mesenteritis or mesenteric panniculitis) may pre- sent with abdominal discomfort, pain, diarrhoea, and weight loss. Chronic fibrosing inflammation involves the root of the mesentery and small bowel. In some cases it has been associated with retroperi- toneal fibrosis, a desmoid or carcinoid tumour of the small bowel. It is more common in males and may have a prolonged debilitating course. Treatment is with tamoxifen and corticosteroids. Leiomyomatosis peritonealis disseminata is an uncommon condition characterized by subperitoneal proliferation of benign nodules composed of smooth muscle cells. It is most common in premenopausal women and hormonal influences may play a role in its pathogenesis. The macroscopic appearance mimics peritoneal carcinomatosis but the clinical course is benign and may regress with stopping hormone therapies. (a) (b) Fig. 15.19.4 Intravenous and oral contrast-enhanced CT images showing enhancing tumour nodules in the greater omentum (arrows in (a)), ascites, and nodular thickening of the pelvic peritoneum (arrow in (b)) in a case of metastatic colon cancer. From Levy AD, Mortele KJ, Yeh BM (eds) (2015). Gastrointestinal imaging. By permission of Oxford University Press. (a) (b) Fig. 15.19.5 Intravenous contrast-enhanced CT showing low-attenuation mucinous ascites scalloping the liver margin (arrow in (a)). The spleen is engulfed by mucin, which contains areas of calcification (arrowhead in (a)). Large amounts of mucin are evident in (b). From Levy AD, Mortele KJ, Yeh BM (eds) (2015). Gastrointestinal imaging. By permission of Oxford University Press.

15.19 Miscellaneous disorders of the bowel 3031 Endometriosis Endometriosis is defined as the presence of endometrium and stroma outside the uterine cavity and myometrium was first described by von Rokitansky in 1860. It is commonly asymptomatic and occurs in up to 15% of menstruating women. Involvement of the bowel is much less common and only rarely causes symptoms, but when they do occur they are often debilitating and may take years to be diag-nosed. The pathogenesis is considered to be retrograde passage of endometrial tissue into the pelvic organs and subsequent spread by haematogenous or lymphatic dissemination. When implanted, the tissue continues to be hormonally modulated. It is most commonly left-sided within the abdomen in the rectosigmoid region (80%) fol- lowed by ileum, caecum, and appendix. Small serosal endometriotic nodules rarely cause symptoms, but large collections and those in a subserosal location may result in vague abdominal and back pain, diarrhoea, constipation, and abdominal bloating, symptoms that closely mimic the irritable bowel syndrome. Rectal bleeding may occur, but symptoms are not often cyclical. Symptomatic endomet- riosis is found in women of childbearing age and is uncommon be- fore age of 20 years. It is important to consider the diagnosis in any women with prolonged symptoms suggestive of the irritable bowel syndrome who does not respond to initial therapies and in those whose pain is not relieved by defecation. Nevertheless, diagnosis may be difficult as symptoms can be multiple and diffuse especially if the

lesions are widespread. Imaging is the mainstay of diagnosis and includes transvaginal ultrasonography, double-contrast barium enemas, and colonoscopy, but endometriosis is increasingly being identified with MRI. The presence of methaemoglobin from a re- current haemorrhage within the lesion causes hyperintense T1- weighted images and hypointensity on T2. Old endometriotic lesions with significant fibrosis are less well identified on MRI, and CT scans may be necessary. Some cases are only diagnosed at lapar- otomy or laparoscopic examination of the bowel. Management must be individualized and distinguish between peritoneal and deep infiltrating endometriosis. In some, a solely expectant and conser- vative approach or medical therapy is appropriate. Few trials have been performed. Inducing a pseudo-pregnancy state with low-dose oestrogen–progestogen is not recommended for intestinal disease, and agents that are effective in pelvic endometriosis including the synthetic androgen danazol or gonadotrophin-releasing hormone agonists may not be appropriate in bowel endometriosis as they may promote fibrosis. A cautious trial of therapy as a first line may be indicated but laparoscopy or surgery will be needed in those with severe symptoms or partial bowel obstruction. FURTHER READING Boland K, Nguyen GC (2017). Microscopic colitis: a review of collagenous and lymphocytic colitis. Gastroenterol Hepatol (NY), 13, 671–7. Cameron IC, et al. (1995). Intestinal endometriosis: presentation, in- vestigation, and surgical management. Int J Colorectal Dis, 10, 83–6. Cipolletta L, et al. (1995). Malakoplakia of the colon. Gastrointest Endosc, 41, 225–8. Gagliardi G, et al. (1996). Pneumatosis coli: a proposed pathogenesis based on study of 25 cases and review of the literature. Int J Colorectal Dis, 11, 111–18. Kelly D (2006). Intestinal failure associated liver disease—what do we know today? Gastroenterology, 130, 870–7. Nyhlin N, et al. (2006). Systematic review: microscopic colitis. Aliment Pharmacol Ther, 23, 1525–34.

Revision #1
Created 2026-01-22 16:38:38 UTC by Omar Ayman
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