



Colonic diverticular disease

BACKGROUND Diverticular disease of the colon is common and the spectrum is broad, ranging from asymptomatic diverticulosis to perforation and massive haemorrhage requiring emergency colectomy.

OBJECTIVE This article discusses the epidemiology, pathophysiology, symptomatology and management of common presentations of diverticular disease including a brief review of surgical management.

DISCUSSION Management is based on the patient's symptoms and signs with assistance from findings at colonoscopy, computerised tomography scanning and occasionally bleeding localisation studies. For minimally symptomatic patients, a high fibre diet is the mainstay of management. Those with diverticulitis require antibiotics and bowel rest, and hospitalisation may be required. Surgery is indicated for recurrent diverticulitis, complicated diverticulitis, perforation and severe bleeding. This involves resection of the affected colon segment and can be performed laparoscopically or open.

Diverticular disease (DD) is present in 10% of people aged over 45 years, and 65% of people aged over 70 years in western populations.¹ The disease is common in areas of economic development, and is associated with a western low fibre diet. The highest incidence of DD is in Europe, North America and Australia. Colonic diverticular disease most often affects the sigmoid and left colon in western populations, whereas in Asian populations the right side is mainly affected.²

Pathophysiology

Colonic diverticulae are acquired pulsion diverticulae (*Figure 1*). The combination of increased intraluminal pressure and weakness in the muscle coat of the colon results in the mucosa bulging through the muscle. Manometric studies show that segmental colon wall contractions, and thus intraluminal pressure, is greatest in the sigmoid. This correlates with the anatomical location of diverticulae as well as the presence of muscular hypertrophy in the colon wall in the region of diverticulae (*Figure 2*). The mucosa bulges through the weakness in the muscle wall at the site of perforating vessels, between the taenia coli. There is a strong correlation between low fibre diet, low stool bulk, subsequent increased intraluminal pressure and the development of diverticulosis.³

Case history 1

A woman, 65 years of age, who is otherwise well, presents with several years of abdominal pain and irregular bowel habits. Colonoscopy revealed moderate sigmoid diverticulosis without evidence of stricture or inflammation.



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This case represents the commonest manifestation of DD, that of the asymptomatic or minimally symptomatic patient. In many such patients, the presence of diverticulae is incidental, and the pain is in fact due to irritable bowel syndrome (IBS). In most patients however, the attribution of the pain to DD or IBS is academic, as the treatment is the same.

Management of mild DD

Reassurance and a high fibre diet is the mainstay of both conditions. The ingestion of 20–30 g of bran per day has been demonstrated to negate the underlying increased intraluminal pressure and limit the progression of disease.⁴ There is no evidence however, that this will prevent the development of complications such as diverticulitis or bleeding. The avoidance of foods containing seeds or pips has been proposed, based on the theory that such indigestible matter can lodge in the mouth of



Figure 1. Colonoscopic appearance of diverticulosis



Figure 2. Resected specimen from a man aged 32 years who suffered recurrent attacks of acute diverticulitis. Note marked bowel wall and mesenteric thickening

a diverticulum and cause complications. Again, there is no supportive scientific evidence and experience at colonoscopy suggests that if a diverticulum does contain anything, it is usually a faecolith. Simple analgesia may be beneficial, but opiates are best avoided as they are constipating. There is no evidence to support anticholinergics or antibiotics.

Diverticulitis, DD or IBS?

The differentiation between symptomatic DD and IBS becomes more important in a patient with significant symptoms in whom surgical treatment is being contemplated. Colon resection will be successful in patients whose symptoms are due to DD, but not in those with DD but symptoms due to IBS. Crucial in this differentiation is evidence of inflammation or diverticulitis. The pain of IBS tends to be spasmodic, but is particularly related to the passage of a bowel motion.

Factors suggestive of diverticulitis are a history of more severe episodes of constant pain lasting several days, often resolving after the commencement of antibiotics. A documented fever at the time of the pain is useful, as are an elevated white cell count or the presence of colon wall thickening, mesenteric stranding or pericolic fluid on computerised tomography (CT) scanning. For this reason, it is reasonable to investigate patients with left lower quadrant pain and tenderness with full blood examination (FBE) and CT scan, even if their clinical condition does not warrant admission to hospital. In more difficult cases, diagnostic laparoscopy is helpful. If a soft, supple colon with no inflammatory adhesions is present, the patient can be advised that they are unlikely to benefit from colon resection.

There is a small group of patients who develop a true stricture related to previous episodes of diverticulitis. This can be diagnosed at colonoscopy, but barium enema evidence of proximal colon dilation is supportive. Ultimately in some patients the nature of the pain remains unclear and the decision to offer surgery becomes one of trying to assign a probability for success. As always, adequate informed consent is important. In particular, the patient must be aware that the distinction between DD and IBS as the aetiology for their pain is unclear, and that there is a possibility that their symptoms will persist.

If resection is undertaken, it is essential that the distal resection margin is in the upper rectum, and the proximal resection margin is in soft, supple bowel. This can be done as a laparoscopic assisted or open procedure.

Case history 2

A man 45 years of age presents with 4 days of left lower quadrant pain and diarrhoea. On examination he is febrile 37.9, slightly distended and locally tender.

This fits the clinical picture of acute diverticulitis, or inflammation of the diverticula bearing colon. This results from obstruction of the neck of a diverticulum with a faecolith, causing in local bacterial overgrowth and inflammation and often localised perforation, sealed off by adjacent bowel, abdominal wall or omentum.⁵ An FBE and CT scan will usually be adequate to confirm the diagnosis. Computerised tomography findings of diverticulitis include the presence of diverticulae, and thickening and inflammation of the colon wall, mesentery and adjacent tissues.⁶ In addition, early diagnosis of diverticular abscess can be made. Barium enema is contraindicated because of the risk of perforation.

Management of diverticulitis

Initial management is antibiotics and bowel rest. The decision to admit to hospital is based on the degree of tenderness, systemic upset, general health and home supports. For outpatient management, oral metronidazole and amoxycillin, and clear fluids by mouth are commenced. The patient should be reviewed the next day, and if there is no improvement, admitted to hospital where they can be given intravenous fluids and antibiotics. Of those admitted, 75% will recover with nonoperative management.⁷

Patients with diverticular abscess should be admitted. Advances in interventional radiology now allow for percutaneous drainage which saves many patients an operation.⁸ This is indicated for all abscesses over 5 cm, and those not improving.

Surgery is indicated for those who develop free perforation, or who fail nonoperative measures. In almost all cases this involves a Hartman's procedure with resection of the involved segment, oversewing of the rectal stump and formation of end colostomy. Technical issues at this operation are to minimise the resection to the inflamed colon, minimise the colon mobilisation to just sufficient to bring up a healthy colostomy, and to avoid dissection around the rectum. This avoids inflammation and subsequent scarring in the retroperitoneal and pelvic spaces facilitating a smoother reversal operation in 6 months.

Of those who resolve with nonoperative management on the initial attack, 70% have no further recurrences.⁹ However, with subsequent attacks, the complication rate increases.¹⁰ Colonoscopy is indicated after 6 weeks to confirm the diagnosis and exclude underlying malignancy. Elective colon resection is indicated after recurrent attacks of acute diverticulitis, after complicated initial attacks, and in younger patients as they have a higher recurrence and complication rate.¹¹

Case history 3

A man 78 years of age on clopidigrel after a coronary stent, presents with small volume, bright red blood twice a week for 3 months. Colonoscopy reveals diverticular disease and haemorrhoids.

This type of bleeding is not typical of DD. The decision to continue the clopidigrel depends on the risk of coronary re-occlusion and is made in consultation with the cardiologist. In many cases, no treatment is required. Nevertheless, in this age group colonoscopy is indicated to exclude malignancy.

Case history 4

A woman 82 years of age presents with a 12 hour history of dark cherry red rectal bleeding. She is hypotensive. After saline fluids for resuscitation her haemoglobin is 82.

This is consistent with a diverticular bleed, the differential diagnosis being angiodysplasia or carcinoma. Management is admission, resuscitation and observation. Labelled red cell scan or mesenteric angiography may localise the bleeding point, depending on the local availability and expertise. Urgent colonoscopy will exclude malignancy and may be therapeutic with electrocoagulation argon plasma coagulation and haemostatic clips now available. Surgery is required in patients with ongoing bleeding and haemodynamic instability despite resuscitation, or who require blood transfusion of greater than 8–10 units.

Conclusion

Colonic diverticular disease covers a wide spectrum of clinical presentations. Management is based on the patient's symptoms and signs with assistance from findings at colonoscopy, CT scanning and occasionally

bleeding localisation studies. Surgery is indicated for recurrent diverticulitis, complicated diverticulitis and perforation, and severe bleeding. This involves resection of the affected colon segment, and can be performed laparoscopically or open.

Summary of important points

- In patients with mild symptoms and diverticulæ, pain may be due to IBS rather than DD.
- Asymptomatic or mildly symptomatic patients are treated with a high fibre diet as simple analgesia if required for pain, avoiding opiates.
- Features that distinguish inflammation (diverticulitis) from IBS include constant pain lasting several days, fever, raised white cell count and pain resolving after commencement of antibiotics. Colon inflammation can be identified on CT scanning by wall thickening, mesenteric stranding or pericolic fluid.
- Diverticulitis is treated with antibiotics (metronidazole and amoxicillin) and bowel rest and may require inpatient care; 75% of patients admitted do not require operative management.
- Colonoscopy is indicated 6 weeks after resolution of diverticulitis to confirm the diagnosis and exclude malignancy.
- Patients who develop a diverticular abscess require admission and, if the abscess is over 5 cm, percutaneous drainage.
- Resection of the affected segment of colon is indicated for patients with recurrent diverticulitis or who develop complications including perforation or bleeding.

Conflict of interest: none declared.

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