DIVERTICULITIS

Introduction

Diverticular disease is an extremely common presentation to the Emergency Department.

Disease severity can range from mild exacerbation which can be managed on an outpatient basis, to severe disease which may be life-threatening.

Mild symptoms may result from symptoms relating to diverticulosis or mild diverticulitis.

Moderate to severe disease will result from active diverticulitis.

The most serious complications include perforation and peritonitis, and massive GIT hemorrhage.

CT scan of the abdomen is the investigation of choice for suspected diverticulitis. This is ideally done with oral and IV contrast, however if the patient is unable to tolerate oral contrast, then IV alone may be used, or even plain CT without contrast.

Pathophysiology

Diverticulosis

Diverticulosis merely refers to the presence of diverticulae within the bowel wall.

Diverticula are very common in people from Western countries.

The incidence of diverticula increases with age, affecting approximately one half of those over the age of 80 years.

Diverticula are herniations of the colonic mucosa through the muscle layer of the large bowel.

They are thought to be formed as a result of high intraluminal pressure, forcing the mucosa through the muscle layer where it is weakened by penetration of a colonic artery.

This has been attributed to increased muscular contraction required to propel less bulky stools in those consuming low-fiber Western diets, and is consistent with the hypertrophied circular muscle layer and shortened taenia coli commonly found in these individuals.¹
Locations include:

- Most occur in the left sided regions of the sigmoid and descending colon, but any part of the large bowel can be affected.
- Right-sided diverticular disease is more commonly seen in Asian and younger populations.

**Diverticulitis**

*Diverticulitis* occurs as a result of inflammation of one or more diverticula, and is usually associated with some degree of localized peritonitis.

Its exact pathogenesis remains unclear.

Fecal material or undigested food particles may collect in a diverticulum, causing obstruction, (see photograph below) followed by secondary sepsis.

![Diverticulitis Image](image.jpg)

*An impacted fecalith, arrowed, with surrounding edema and erythema seen on colonoscopy within the sigmoid colon. (from Robert S. Fisher and Siva P. Doma, Images in Clinical Medicine, NEJM, July 16, 2009)*

**Organisms:**

The organisms involved in bacterial infection include:

1. Anaerobes including:
   - Bacteroides
2. Gram-negative aerobes, including:
   Escherichia coli

3. Facultative gram-positive bacteria, such as streptococci, are often cultured as well.

Complications of diverticulitis:

Important complications include:

1. Recurrent periodic inflammation and pain.
   - In some patients these episodes may be clinically silent.

2. Abscess formation
   - Infected diverticula may undergo abscess formation.

3. Perforation
   - This may lead to general peritonitis or local pericolic abscess.

4. Intestinal obstruction.
   - Due to chronic scarring and stricture formation or local adhesions.

5. Haemorrhage:
   - This is usually dark red lower GIT type bleeding
   - Diverticular disease is the most common cause of massive lower gastrointestinal bleeding. Fewer than 15% of patients with diverticular disease however will experience bleeding.
   - It is more likely to occur in patients taking antiplatelet agents or NSAIDs.

6. Fistula formation:
   - This may be to any adjacent structure, such as bladder, or another loop of bowel, or the uterus in females.
Clinical Features

Diverticulosis:

Uncomplicated diverticular disease (diverticulosis) is usually asymptomatic.

A minority of patients may develop:

- Colicky lower abdominal pain
- An irregular bowel habit, commonly alternating constipation and diarrhoea.
- Distension
- Flatulence.

Diverticulitis:

Diverticulitis is usually seen in patients over the age of 40.

There is a spectrum of disease from a sub-clinical local inflammation to bleeding to generalized peritonitis secondary to perforation.

Clinical features include:

1. Fever.

2. Pain:
   - Typically constant, (as opposed to colicky)
   - Most commonly in the left iliac fossa, but may occur anywhere.

3. There may be signs of peritonism.
   - Guarding, (voluntary or involuntary)
   - Rebound tenderness.
   - Rigidity, (suspect perforation)

4. The stools may be loose or there may be constipation.

5. Rectal haemorrhage:
   - Diverticulitis is a common cause of rectal bleeding, especially in the elderly.
Despite diverticula being more common on the left side of the colon, the majority of diverticular bleeds arise from the right hemicolon.

**Staging of severity:**

The severity of diverticulitis is often graded with the use of Hinchey’s criteria (see appendix 1 below), although this classification system does not take into account the effects of coexisting conditions on disease severity or outcome.

The risk of death is:

- Less than 5% for most patients with stage 1 or 2 diverticulitis
- Approximately 13% for those with stage 3
- Approximately 43% for those with stage 4

**Investigations**

**Blood tests:**

1. FBE:
   - Low Hb if bleeding has been significant
   - Elevated WCC, suggests active inflammation
2. CRP
   - An elevated level, suggests active inflammation
3. U&Es / glucose
4. LFTs

**Consider:**

5. Lipase, (pancreatitis as a differential diagnosis in anyone with abdominal pain).
6. Lactate. (degree of illness, or mesenteric ischaemia, in the elderly).
7. Blood group and save or cross match as clinically indicated.

**Plain radiography:**
This cannot make a diagnosis of diverticular disease, but may provide some useful information.

- **CXR**
  - Look for signs of perforation

- **AXR (erect/supine)**
  There may be some regions of localized ileus or partial obstruction.
  - Gas in the portal venous system, is a **late and ominous** sign

**ECG:**

- As for any **very unwell** patient.

- Document the presence of AF, which in the elderly may increase suspicion for mesenteric ischemia as a possible differential diagnosis.

**CT scan:**

CT scan of the abdomen and pelvis is the investigation of choice for suspected diverticulitis. It is both highly sensitive and specific for diverticular disease.

Radiologists like to **ideally** have this done with oral and IV contrast:

- Often however a patient is unable to tolerate large amounts of oral contrast, then IV contrast alone may be used.
  
  The administration of oral contrast may also cause significant delay in the investigation and this may need to be weighed against how unwell the patient is.

- If there is a major concern about IV contrast, (such as significant renal impairment), then a plain CT scan is still useful, *(and far better than no imaging at all!)*

  IV material is often administered routinely, although it usually is not essential for diagnosis. Intravenous contrast material may help in revealing diverticular abscesses and fistulas and in demonstrating the enhancement pattern of the colonic wall. However, it is probably more helpful in the diagnosis of alternative diseases that may mimic diverticulitis.

- In some cases a water soluble contrast enema may be preferred.
CT may also reveal other disease processes accounting for lower abdominal pain, such as appendicitis, tubo-ovarian abscess, or Crohn’s disease. One limitation of CT scanning is the potential difficulty in differentiating diverticulitis from colon carcinoma.

Typical findings of diverticulitis on CT scan include:

- The presence of diverticulae

Together with one or more of:

- Wall thickening
- Enhancement of the colonic wall
- Stranding of the adjacent pericolic or mesenteric fat

In more severe complicated disease the following may also be seen:

- Abscesses
- Signs of perforation
- Fistula formation
- Obstruction

**Colonoscopy:**

This is usually reserved for patients who have recovered from an attack, as in the acute phase there is a risk causing perforation.

Patients should have a colonoscopy following a first episode (after full recovery) to confirm the diagnosis of diverticular disease.

**Management**

1. ABC issues, as indicated.
   - IV fluid resuscitation as required.
2. Correct electrolyte disturbances:
   - In particular, hypokalemia.
3. Nil orally
4. Analgesia:
5. Nasogastric tube:
   - This may be considered if there is significant vomiting or abdominal distension.

6. Antibiotics:

   **Mild infections in well patients may be treated with oral antibiotics:**
   - Amoxycillin and clavulanate
   - **OR**
   - Metronidazole plus cephalexin

   *See latest edition of Gastrointestinal Therapeutic Guidelines for alternatives and full prescribing details.*

   *If there is no improvement in 48 to 72 hours, consider CT scan of the abdomen to look for evidence of complicated diverticulitis (eg intra-abdominal collection).*

   *For more severe cases, IV antibiotics will be required:*

   *Options include:*  
   - Ceftriaxone + Metronidazole
   - **OR**
   - Ampicillin + gentamycin + Metronidazole.
   - **OR**
   - Tazocin, (piperacillin + tazobactam)
   - **OR**
   - Ticarcillin + clavulanate.

   *See latest edition of Antibiotic or Gastrointestinal Therapeutic Guidelines for full prescribing details.*

7. Surgery:
Symptoms usually settle with conservative management, but occasionally surgery will be needed for severe or complicated cases.

Some localized larger abscesses may be suitable for percutaneous drainage procedures.

In general terms indications for surgery with resection of diseased segments of bowel will include:

- Peritonitis associated with perforation
- Abscess, not amenable to percutaneous drainage
- Bowel obstruction.
- If a fistula has formed between a diverticulum and an adjacent organ, elective repair is indicated.
- Elective surgery should also be considered, if there are more than 2 episodes of severe diverticulitis (i.e. requiring hospitalisation).

8. Diverticular bleeding:

These cases will settle spontaneously in around 80% of cases.

If the bleeding continues the site of bleeding may be localised with red cell scanning or CT angiography.

If bleeding fails to settle, therapeutic options include:

- Urgent colonoscopy with direct treatment of the bleeding vessel with using endoscopic techniques.
- Selective angiography with embolization of the bleeding vessel.
- Surgery, colectomy.

Disposition

Mild cases may be treated as an outpatient

Indications for admission to hospital include:

- Unable to tolerate oral fluids
- Intractable pain
- Milder disease that is not responding to standard treatment
- Moderate to severe cases requiring IV antibiotics and in some cases surgery.

  Including severe complication such as peritonitis from perforation, septicemia or major hemorrhage

- Considerations of comorbidities

- Diagnostic uncertainty

**Appendix 1: Staging of Severity of Diverticular Disease**
The Hinchey Scheme for the grading of severity of diverticular disease.¹

Patients with stage 1 disease have small, confined pericolic or mesenteric abscesses, whereas those with stage 2 disease have larger abscesses, often confined to the pelvis. Stage 3 disease, or perforated diverticulitis, is present when a peridiverticular abscess has ruptured and caused purulent peritonitis. Rupture of an uninflamed and unobstructed diverticulum into the free peritoneal cavity with fecal contamination, the so-called free rupture, signifies stage 4 disease and carries the highest risk of an adverse outcome.

References


Dr J. Hayes
Dr. S. Herodotou
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