

Intestinal obstruction and ileus

The term ileus is now most often used to imply non-mechanical intestinal obstruction. The term paralytic ileus is sometimes used when the problem is inactivity of the bowel.

NB: obstruction to free passage of contents can occur at any level of the gut but only obstruction beyond the duodenum will be considered here. For conditions causing obstruction at a higher level, see the separate articles on [Oesophageal strictures, webs and rings](#), [Oesophageal cancer](#), [Gastric cancer](#) and [Infantile hypertrophic pyloric stenosis](#).

How common is intestinal obstruction? (Epidemiology)

Of all patients admitted to hospital with intestinal obstruction, most have small intestinal obstruction. 10–18% of colorectal malignancies present with obstruction.^[1]

Volvulus, impaction of the intestine, constipation and megacolon are all more common in patients with presenile dementia and Alzheimer's disease, Parkinson's disease, multiple sclerosis and quadriplegia. Schizophrenia has an increased risk for megacolon and constipation whilst major depression is associated only with constipation but with none of the other colonic diseases.

Risk factors

- **Small intestinal obstruction:**
 - May be due to adhesions, strangulated hernia, malignancy or volvulus. The majority (75%) of small bowel obstructions are attributed to intra-abdominal adhesions from prior operations.^[2]
 - 80% of all bowel obstructions occur in the small bowel.^[3]

- **Large intestinal obstruction:**^[4]
 - Is most often the result of colorectal malignancies. Patients are often aged over 70.
 - The risk of obstruction increases the further down the bowel the lesion is sited, as the contents become more solid.
 - Tumours are often advanced and there may be distant metastases.
 - Perforation can occur at the site of the tumour or in a dilated caecum.
- **Sigmoid and caecal volvulus:**^[5]
 - Describes rotation of the gut on its mesenteric axis. The sigmoid colon is the most common site of volvulus and accounts for 5% of large bowel obstruction.
 - It is usually seen in the elderly or those with psychiatric illness.
 - It is a common cause of intestinal obstruction in Africa where the incidence is much higher than in Europe and America. This difference is thought to be due to a relatively high-fibre diet.

- **Paralytic ileus** [6] describes the condition in which the bowel ceases to function and there is no peristalsis. Intestinal pseudo-obstruction is also called Ogilvie's syndrome. It results from massive dilatation of the colon but possibly small intestine too. It may occur in association with a number of medical conditions including:
 - Prolonged abdominal, pelvic or colorectal surgery.
 - Open surgery.
 - Chest infection.
 - Acute myocardial infarction.
 - Stroke.
 - Acute kidney injury.
 - Puerperium.
 - Trauma.
 - Severe hypothyroidism.
 - Electrolyte disturbance.
 - Diabetic ketoacidosis.
- **Postoperative ileus** is a significant problem. Reduced handling of the bowel at operation is recommended.
- **Congenital gastrointestinal malformations** can cause neonatal intestinal obstruction. Another cause of meconium ileus is cystic fibrosis. Volvulus and midgut malrotations affect children and are uncommon.
- **Hirschsprung's disease** can cause blockage of the bowel. It may present early or late in childhood. Intussusception in children blocks the bowel. Intussusception in adults is much less common and does not tend to obstruct.
- **Miscellaneous causes** in adults include gallstone ileus (which occurs when a large gallstone is passed into the gut and blocks it), severe constipation causing faecal impaction, and [Crohn's disease](#). Malignancy may cause obstruction from outside the gut - eg, gynaecological tumours.

- **Bezoars** – eg, medication bezoars (tablets or semi-liquid masses of medications, most often formed following overdose of sustained-release medications) and trichobezoars (a bezoar formed from hair).
- **Body packers** can develop intestinal obstruction when packets of illicit drugs packed in condoms are swallowed and trapped in the bowel. The packages may be visible on X-ray. If they leak, intoxication will occur.^[7]

Intestinal obstruction symptoms (presentation)

The typical clinical symptoms associated with obstruction include nausea, vomiting, dysphagia, abdominal pain and failure to pass bowel movements. Clinical signs include abdominal distention, tympany due to an air-filled stomach and high-pitched bowel sounds.^[8]

History ^[3] ^[4] ^[5] ^[6]

There is considerable overlap with the presentation of the various conditions although some features may be more prominent or occur earlier in one cause than another. Differentiation on clinical grounds alone is often not possible.

- Diffuse, central abdominal pain of a colicky nature. Pain is less or absent in paralytic ileus but there may be a history to suggest causes.
- Vomiting tends to be early in high-level obstruction. Faeculent vomiting is extremely unpleasant and is limited to low obstruction. Retrograde peristalsis results in faecal material being brought back.
- The progress of the condition tends to be faster in small bowel obstruction and slower with lower levels of lesions.
- Abdominal distension: the lower the level of obstruction, the more marked this will be.
- Absolute constipation tends to be earlier in low obstruction and later in high-level obstruction. In low-level obstruction there may be a history of progressive constipation or change in bowel habit. In paralytic ileus there is no bowel movement and no flatus.

- In sigmoid volvulus the picture is rather like large bowel obstruction with pain, constipation, late vomiting and a very marked degree of abdominal distension. Half of such patients will have had a previous episode.
- Colonic pseudo-obstruction:
 - Occurs when there is an autonomic imbalance resulting in sympathetic over-activity affecting some part of the colon. The patient is often elderly with numerous comorbidities.^[9]
 - Pseudo-obstruction presents like a large bowel obstruction but the other medical history may indicate the true nature.
- Severe pain and tenderness suggest ischaemia or perforation.

Examination

- Look for signs of dehydration such as poor peripheral perfusion, tachycardia and hypotension. Dehydration is caused by water remaining unabsorbed in the bowel and losses from vomiting without the ability to replace orally. Pyrexia may suggest perforation or infarction of the bowel.
- Examination of the abdomen starts with observation. Abdominal distension will be apparent. It may be worth measuring abdominal girth to monitor progress. Massive peristalsis may even be visible.
- Distended bowel is very resonant on percussion. Abdominal masses may possibly be felt but even a large mass may be missed in a grossly distended abdomen.
- If strangulation or perforation occurs there will be features of an acute abdomen with peritonism.
- Check hernial orifices. Femoral hernia is at high risk of obstruction. Inguinal hernia is a lower risk factor but it is much more common.
- Place a stethoscope on the abdomen to listen for bowel sounds. In obstruction they are very active and tinkling bowel sounds are characteristic. In ileus the bowel is silent or nearly so. Bowel sounds are very irregular and so auscultation must not be rushed if a true picture is to be achieved.

- The patient may be generally toxic and unwell because ischaemia of the bowel causes peritonitis and septicaemia.

Diagnosing intestinal obstruction and ileus (investigations)

- Fluid charts are required to monitor intake and output, especially as an intravenous infusion is almost certainly required, a nasogastric tube may be passed and oliguria is an important sign of early dehydration.
- Plain abdominal X-ray can still be an important investigation:
 - Sensitivity is 50–66% in small bowel obstruction and higher in large bowel obstruction. Films are taken supine and erect. A systematic approach is required. [3] [4]
 - Obstruction of the small bowel shows ladder-like series of small bowel loops but this also occurs with an obstruction of the proximal colon. Fluid levels in the bowel can be seen in upright views.
 - Distended loops may be absent if obstruction is at the upper jejunum.
 - The colon is in the more peripheral part of the film and distension may be very marked.
 - Fluid levels will also be seen in paralytic ileus and the small bowel is distended throughout its length. In an erect film a fluid level in the stomach is normal as may be a level in the caecum.
 - Multiple fluid levels and distension of the bowel are abnormal. Gas under the diaphragm suggests perforation.
- Blood should be taken for FBC, U&Es and creatinine and group and cross-match, as major surgery may be required. Glucose may be slightly elevated by stress but very high levels are a cause for concern.
- CT scanning is now the gold standard for imaging of bowel obstruction, particularly small bowel obstruction. Contrast should be used if the renal function allows. [3]

- CT CAP can also be useful for staging any underlying malignancy in large bowel obstruction. [4]
- MRI may be useful for evaluating obstruction in younger patients who have had multiple CT scans previously. [3]
- Ultrasound scans can detect obstruction but are no substitute for CT scans and should only be used when this will not delay further management. [3]

Differential diagnosis

- **Abdominal pain** and **vomiting** can occur with gastroenteritis but, if the abdomen is bloated and there is little or no bowel movement, obstruction must be considered. Diarrhoea and vomiting will also cause very active bowel sounds that may be confused with the tinkling of obstruction.
- Ischaemia of the gut can cause pain and distension but there is usually bloody diarrhoea.
- The pain of **acute pancreatitis** tends to radiate to the back. There may be an associated paralytic ileus. Amylase is often raised in obstruction but levels are very high in pancreatitis.
- Perforation of the gut can produce an acute abdomen with pyrexia and vomiting. **Peptic ulcer disease**, perforated **diverticular disease** and a perforated carcinoma are all possible causes.
- **Intussusception** should be considered in children.
- **Tuberculosis** can present as gastrointestinal disease.
- Non-gastrointestinal conditions to bear in mind include **myocardial infarction** (small bowel) and **ovarian cancer** (large bowel).

Treatment of intestinal obstruction and ileus (management)

In patients with uncomplicated obstruction, management is conservative, including fluid resuscitation, electrolyte replacement, intestinal decompression and bowel rest. Endoscopy can be used for bowel decompression, dilation of strictures or placement of self-expandable metal stents to restore the luminal flow either as a final treatment or to allow for a delay until elective surgical therapy. When gastrointestinal obstruction results in ischaemia, perforation or peritonitis, then emergency surgery is required. [8]

Resuscitation is very important. Correction of fluid and electrolytes considerably reduces the operative risk before surgery for obstruction. In pseudo-obstruction, correction of such abnormalities will facilitate the return of normal bowel function. Note urine output as a sign of adequate replacement. In paralytic ileus a nasogastric tube will reduce vomiting.

Surgery

- Laparotomy may be required without a clear diagnosis. Resection of the bowel may be required and so blood must be cross-matched and available. Informed consent before the operation should include the fact that a stoma may be required.
- If possible, it is worth awaiting full resuscitation and fluid replacement before surgery but if the patient is toxic with possible perforation or infarction of bowel, early intervention is required.
- Early surgery is required if there is local or generalised **peritonitis**, evidence of perforation or an irreducible hernia. A palpable mass and failure to improve are relative indications to intervene surgically.
- A more conservative approach is acceptable if there is incomplete obstruction, previous surgery suggesting adhesions, advanced malignancy or suggestion that it is pseudo-obstruction.
- In view of the risk of perforation and absorption of toxins from ischaemic bowel, prophylactic antibiotics for gut surgery are advised.

Non-surgical treatment

- Endoscopic stenting is a further advance in the management of small and large bowel obstruction and may be particularly useful in the palliative care of cancer patients and in the elderly.^[10] ^[11] Self-expanding stents are of particular value in the management of obstruction of the large bowel.^[12]
- If adhesions are thought to be the cause of obstruction then conservative measures may be sufficient.

Volvulus

See also the separate [Volvulus and midgut malrotations](#) article.

- [Sigmoid volvulus](#) can be treated conservatively in many cases. Sigmoidoscopy and passage of a flatus tube may be successful. Failure of decompression or evidence of perforation requires operation.
- Around 25% of colonic volvulus is of the caecum. It involves the terminal ileum and ascending colon. Decompression via the colonoscope may work but usually surgery is required. Ischaemic bowel may require resection. Fixation prevents recurrence.
- Caecal volvulus is an uncommon and poorly recognised condition.^[13] There may be a history of previous, intermittent, self-limiting abdominal pain.

Pseudo-obstruction

In intestinal pseudo-obstruction the cautious use of neostigmine may aid recovery but most important is the correction of fluid and electrolyte imbalance.^[14] Colonoscopy may need to be used for decompression. Early recognition and management are vital if perforation is to be avoided.^[15]

Malignant bowel obstruction

See also the separate [Colorectal cancer](#) article.

- The management of patients with obstruction due to malignancy who are unfit for surgery provides considerable problems. Corticosteroids, opioids, antispasmodics, antiemetics and antisecretory agents may all be of benefit.^[16]

- One review (based only on a few studies) regarding colonic stenting for malignant large bowel obstruction found:^[17]
 - Although emergency colonic stenting appears to be an effective treatment of malignant large bowel obstruction, there were no advantages in terms of overall complication rate and 30-days postoperative mortality.
 - However, when colonic stenting was used as a bridge to surgery, it provided surgical advantages, a higher primary anastomosis rate and a lower overall stoma rate, without increasing the risk of anastomotic leak or intra-abdominal abscess. However, these results should be interpreted with caution because few studies reported data on these outcomes.

Complications of intestinal obstruction

- Carcinomas causing obstruction are usually primary small or large bowel cancers. Metastases from other organs are rare.^[18]
- Perforation and ischaemia of the bowel may cause peritonitis and septicaemia.
- Fluid and electrolyte imbalance, hypovolaemia and septicaemia may all contribute to circulatory collapse and acute kidney injury.
- In acute colonic pseudo-obstruction, if perforation or ischaemia occurs the mortality is 40%.^[19]

Prognosis

- In patients with small bowel obstruction, the mortality is 14% if surgery is delayed, compared to 3% if this is performed immediately.^[20]
- The prognosis of advanced carcinoma of the colon remains poor. A high proportion of patients who present with obstruction have distant metastases.^[21]
- 50% of sigmoid volvulus will recur in the following two years.
- Older patients, patients with hypoalbuminaemia and those in whom the primary tumour is not gastrointestinal in origin are less able to withstand the rigours of major surgery.^[22]

Further reading

- [Catena F, De Simone B, Coccolini F, et al](#); Bowel obstruction: a narrative review for all physicians. World J Emerg Surg. 2019 Apr 29;14:20. doi: 10.1186/s13017-019-0240-7. eCollection 2019.
- [Yoo RN, Cho HM, Kye BH](#); Management of obstructive colon cancer: Current status, obstacles, and future directions. World J Gastrointest Oncol. 2021 Dec 15;13(12):1850-1862. doi: 10.4251/wjgo.v13.i12.1850.
- [Schick MA, Kashyap S, Meseeha M](#); Small Bowel Obstruction.
- [Lieske B, Antunes C](#); Sigmoid Volvulus.
- [Lieske B, Meseeha M](#); Large Bowel Obstruction.
- [Beach EC, De Jesus O](#); Ileus.

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