Small Bowl Obstruction

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Definition:
Intestinal Obstruction is defined as partial or complete blockage of the bowel that results in the failure of intestinal contents to pass.

**Dynamic** : in which peristalsis is working against a mechanical obstruction.

**Adynamic** : in which there is no mechanical obstruction but peristalsis is absent or inadequate
Causes of intestinal obstruction

Dynamic
- Intraluminal
  - Faecal impaction
  - Foreign bodies
  - Bezoars
  - Gallstones
- Intramural
  - Stricture
  - Malignancy
  - Intussusception
  - Volvulus
- Extramural
  - Bands/adhesions
  - Hernia

Adynamic
- Paralytic ileus
- Pseudo-obstruction
Classifications:

-Motility: functional VS mechanical
-Extent of obstruction: partial VS complete.
-Pathological nature: simple VS complicated (strangulated).
-Level of obstruction: proximal VS distal.
Causes:

- Adhesions
- Hernias
- Neoplasm
- Strictures
- Volvulus
- Intussusception
- Gallstones
Pathophysiology:

In dynamic (mechanical) obstruction the bowel proximal to the obstruction dilates and the bowel below the obstruction exhibits normal peristalsis and absorption until it becomes empty and collapses.

Initially, proximal peristalsis is increased in an attempt to overcome the obstruction. If the obstruction is not relieved, the bowel continues to dilate; ultimately there is a reduction in peristaltic strength, resulting in flaccidity and paralysis.
**Gas**: there is a significant overgrowth of both aerobic and anaerobic organisms, resulting in considerable gas production. Following the reabsorption of oxygen and carbon dioxide, the majority is made up of nitrogen (90%) and hydrogen sulfide.

**Fluid**: this is made up of the various digestive juices. (saliva 500mL, bile 500mL, pancreatic secretions 500mL, gastric secretions 1 liter – all per 24 hours).
TYPES OF MECHANICAL INTESTINAL OBSTRUCTION
Adhesions:

represents 40% of all common causes of obstruction.
The lifetime risk of requiring an admission to hospital for adhesional small bowel obstruction subsequent to abdominal surgery is around 4% and the risk of requiring a laparotomy around 2%.

Any source of peritoneal irritation results in local fibrin production, which produces adhesions between apposed surfaces. Most commonly caused by previous surgery.
<table>
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<th><strong>Table 70.1</strong> The common causes of intra-abdominal adhesions.</th>
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<td>Acute inflammation</td>
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<td>Sites of anastomoses, reperitonealisation of raw areas, trauma, ischaemia</td>
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<td>Foreign material</td>
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<td>Talc, starch, gauze, silk</td>
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<td>Infection</td>
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<td>Peritonitis, tuberculosis</td>
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<td>Crohn’s disease</td>
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Summary box 70.3

Prevention of adhesions

Factors that may limit adhesion formation include:
- Good surgical technique
- Washing of the peritoneal cavity with saline to remove clots
- Minimising contact with gauze
- Covering anastomosis and raw peritoneal surfaces
Hernia:

External hernia; through abdominal wall.

Internal hernia; rare:
- when a portion of the small intestine becomes entrapped in one of the retroperitoneal fossae, in a congenital mesenteric defect, in the foramen of Winslow or through the diaphragm
Gallstone ileus:

-This type of obstruction tends to occur in the elderly secondary to erosion of a large gallstone directly through the gall bladder into the duodenum.

-The patient may have recurrent attacks as the obstruction is frequently incomplete or relapsing.
Bezoars:

- firm masses of undigested hair ball and fruit/vegetable fibers.

- may be associated with an underlying psychiatric abnormality.
Worms:

- Ascaris lumbricoides may cause low small bowel obstruction, particularly in children

- Worms may cause a perforation and peritonitis!!
Acute intussusception:
This occurs when one portion of the gut invaginates into an immediately adjacent segment, almost always, it is the proximal into the distal.

90% is idiopathic, but an associated upper respiratory tract infection or gastroenteritis may precede the condition.
It is believed that hyperplasia of Peyer’s patches in the terminal ileum may be the initiating event.

The condition is encountered most commonly in children, with a peak incidence between five and ten months of age.
Children with intussusception associated with a pathological lead point such as Meckel’s diverticulum, polyp, etc., are usually older than those with idiopathic disease.

Adult cases are invariably associated with a lead point, which is usually a polyp (e.g. Peutz–Jeghers syndrome), a submucosal lipoma or other tumour.

In most children, the intussusception is ileocolic. In adults, colocolic intussusception is more common.
Volvulus:

A volvulus is a twisting or axial rotation of a portion of bowel about its mesentery.

The rotation causes obstruction to the lumen (>180° torsion), obstruction and strangulation (>360 torsion).
Strictures:

- Small bowel strictures usually occur secondary to tuberculosis or Crohn’s disease.
- Malignant strictures associated with lymphoma are uncommon.
- Presentation is usually subacute or chronic.
STRANGULATION

Occurs when the blood supply is compromised and the bowel becomes ischemic which is life-threatening condition. Venous return is compromised before the arterial supply, causes increase in capillary pressure leads to impaired local perfusion and once the arterial supply is impaired, hemorrhagic infarction occurs. As the viability of the bowel is compromised, translocation and systemic exposure to anaerobic organisms and endotoxin occurs.
Causes of strangulation

- Direct pressure on the bowel wall
  - Hernial orifices
  - Adhesions/bands
- Interrupted mesenteric blood flow
  - Volvulus
  - Intussusception
- Increased intraluminal pressure
  - Closed-loop obstruction
Adynamic intestinal Obstruction
Hirschsprung Disease:

Hirschsprung disease (HD) is congenital megacolon characterized by the absence of myenteric and submucosal ganglion cells in the distal alimentary tract.

Approximately 1 per 5000 live births.

4 times more common in males than females.
Paralytic ileus:

-A condition in which there is failure of transmission of peristaltic waves secondary to neuromuscular failure.

-Postoperative duration of 24–72 hours.

-Infection: Intra-abdominal sepsis may give rise to localized or generalized ileus.

-Reflex ileus: This may occur following fractures of the spine or ribs, retroperitoneal hemorrhage.

-Metabolic: Uremia and hypokalemia
Pseudo-Obstruction:

- an obstruction, usually of the colon, in the absence of a mechanical cause or acute intraabdominal disease.

It is associated with a variety of syndromes in which there is an underlying neuropathy and/or myopathy.

The exact mechanism is unknown, yet it is thought to be due to an interruption of the autonomic nervous supply to the colon resulting in the absence of smooth muscle action in the bowel wall.
clinical features:

The four cardinal symptoms of intestinal obstruction are:
- Abdominal pain
- Distension
- Constipation
- Vomiting
Pain:

Pain is the first symptom encountered; it occurs suddenly and is usually severe. It is colicky in nature. centered on the umbilicus (small bowel) or lower abdomen (large bowel). With increasing distension, the colicky pain is replaced by a mild and more constant diffuse pain.

The development of severe pain is suggestive of the presence of strangulation, especially if continuous.

Not seen in paralytic ileus.
**Vomiting:**

Frequent vomiting, nature of Vomitus depends on the level of obstruction. The more distal the obstruction, the longer the interval between the onset of symptoms and the appearance of nausea and vomiting.

(watery and acidic>>Greenish-Blue and Bile-Stained>>faeculant)
**Constipation:**

This may be classified as absolute (i.e. neither faeces nor flatus is passed) or relative (where only flatus is passed). Absolute constipation is a cardinal feature of complete intestinal obstruction.

Some patients may pass flatus or faeces after the onset of obstruction as a result of the evacuation of the distal bowel contents.
Distention:

In the small bowel, the degree of distension is dependent on the site of the obstruction and is greater the more distal the lesion.

Visible peristalsis may be present

Distension is a later feature in colonic obstruction.
Other manifestations:

- Dehydration
- Pyrexia
- Hypokalemia
- Abdominal tenderness
Physical examination:

Inspection:
- dehydration: dry skin and tongue, poor venous filling, sunken eyes and oliguria.
- distention, visible peristalsis, hernias, scars

Palpation:
Mases, tenderness, guarding, rigidity, obstructed hernia
Auscultation:
frequent and high pitched VS absent.

Digital rectal examination:
obstructive mass in the pouch of Douglas, the apex of an intussusception or faecal impaction.
Investigation
Abdominal X-ray:

valuable in diagnosis of intestinal obstruction, and localizing the site of obstruction.

A loop or loops of distended bowel are usually seen, together with fluid levels on an erect film.

obstruction is suggested by a ladder pattern of dilated loops, central position and by striation that bass completely across the width of the distended loop.
X-RAY Barium Follow-Through:

Patient drinks a contrast medium containing barium sulfate. Contrast medium appears white on x-rays, and shows the outline of the internal lining of the bowel.

X-ray images are taken at intervals as the contrast moves through the intestine

The bowel is accessed as it becomes visible.

The test is completed when the Barium is visualized at the Caecum.
Barium Enema:

injecting a barium sulfate dye through the back passage (rectum) and taking x-ray views of bowel as the dye moves through and fills the large bowel.
CT: combined with oral water-soluble contrast (gastrografin), is particularly useful; it can localize the site of obstruction, detect obstructing lesions and colonic tumors, and may diagnose unusual hernias.
Treatment:

Acute, sudden onset, complete obstruction with risk of strangulation requires **emergent surgical** intervention.

Chronic large bowel obstruction, slowly progressive, and incomplete obstruction can be investigated at some leisure and treated electively.

Although the treatment of specific causes of intestinal obstruction is considered accordingly, there are some general principles applied.
Initial management:

1- Gastrointestinal decompression via a nasogastric tube
2- Fluid and electrolyte replacement
3- Antibiotics:
   - if Strangulation is found or suspected.
   - for all patients undergoing surgery.
INDICATIONS FOR SURGERY:

Absolute
- Peritonitis
- Visceral perforation
- Irreducible hernia
- Intestinal strangulation

Relative
- Palpable mass lesion
- Failure to improve
Operation:

Bowel is inspected and non-viable bowel is removed.

Non-Viability is determined by:
Loss of peristalsis
Loss of Sheen
Greenish or Black (Not Purple; Purple may still recover)
Loss of Pulsation in supplying vessels
Complications associated with intestinal obstruction repair:

- bleeding
- infection
- Abscesses formation
- leakage of stool from an anastomosis
- adhesion formation
- paralytic ileus
- reoccurrence of the obstruction.
Thank you, next.