Bowel Obstruction

Interruption of normal flow of contents through bowel.

Either

Small intestine | Large intestine

Functional | Mechanical

- **Mechanical obstruction causes**:
  - **Extrinsic**: adhesions, hernias, volvulus. extra mural.
  - **Mural**: tumours, inflammatory strictures, intussusception, radiation enteropathy.
  - **Intraluminal**: foreign bodies, gallstone ileus, faecal impaction.

Adhesions
Hernia
Malignancy

⇒ Small Bowel Obstruction (SBO)

Mechanical

↳ Post Surgical Adhesions (formation of scar tissue along the tract).

↳ Surgeries: Abdominal ⅔ pelvic surgeries, C-Section ⅔ Endometriosis, Pelvic Inflammatory disease, Peritonitis.

↳ Volvulus: Twisting and torsion of parts of small bowel → twist around Mesentry ↳ impair Blood supply ⅔ venous drainage

↳ Intussusception: Telescoping ⅔ sliding of the proximal part of the bowel into the distal part

↳ Foreign bodies: Bezoer eg: Trichobezoer (Hair) + phytobezoer (fibers).

↳ Tumours: -

Analysis of: → Blood loss (Anemia) → weight loss → Tumor markers
→ alternating bowel movement (constipation ⅔ overflow diarrhea).
→ Age *** → night sweats / fever / constitutional symptoms

↳ Gall stone Ileus.

* Pneumobilia
Rigler Triad
SBO
ectopic gall stone

Large gall stone causing a cholycystoenteric fistula by erosion of the walls, it travels through the tract until reaching a narrow lumen, typically at the ileocecal valve.

↳ Parasitic infections blocking the lumen (tapeworm, Ascaris lumbricoides)

↳ Hernia: Irreducible: Incarcerated or Strangulated.

↳ Extraluminal compression.

↳ Inflammatory processes: IBD (Crohn's → strictures + UC.)

↳ Congenital atresia: pyloric stenosis.

Clinical Presentation

* Because it is mechanical → ↑↑ increased bowel sounds (to overcome obstruction).
↳ visible peristalsis ↳ Audible peristalsis (Borborygmi)
* Colicky cramping Abd. pain (+ central intermittent) (Any change in the pattern may indicate strangulation/ischemia)
* Abdominal distension (proximal to the site of obstruction). proximal < distal

Fluid-air levels
↳ due to fluid accumulation → Third spacing → fluid movement from intravascular region to the intraluminal region
↳ due to swallowed air accumulation

Normal air
→ ileocecal valve
→ rectum
→ bubble of stomach

⚠ Hypovolemic Shock
⚠ Electrolyte Imbalance.

* Vomiting (Early if proximal, delayed if distal) (+ Nausea)
↳ Bilious Vomiting (proximal, bile-stained).
↳ Feculent Vomiting (due to bacterial overgrowth "stagnation" so flora starts to resemble that of the colonic)
* Constipation or Absolute Constipation (Obstipation with lack of flatulance).
* Diarrhea (in intermittent "overflow diarrhea" or partial obstruction).

Others: → Bacterial translocation (overgrowth in the small intestine and the flora start to resemble the flora of the colon → Feculent).

Complications
↳ LNs → circulation → Sepsis.

Strangulation
→ ↑intraluminal pressure → ↑wall tension → ↑pressure on BVs → ↓↓ compromise the circulation → ischemia → necrosis & gangrene.
↳ Fever / Tachycardia / Peritoneal signs (Rigidity & Guarding).

On PEx → Also Should Check for:

Previous Hx of malignancy

Abdominal Scars
↓
Previous Surgeries
→ Abdominal / Pelvic
→ Gynecological

Digital Rectal Exam. *
→ Empty rectum (vault rectum).
→ Presence of occult blood (strangulation/ischemia)
→ Presence of masses
→ Blummer Shelf (↳ obturator hernia, Prolapse.)
→ BPH

proximal obstruction	distal obstruction
Early vomiting	delayed vomiting
distension ++	Severe distension.
Constipation	Obstipation or absolute constipation

→ The diagnosis of SBO is clinical, yet requires more investigations.

Lab investigation
→ Urinanalysis
→ Creatinine
→ Blood urea Nitrogen.
(Kidney function & dehydration)
→ CBC
→ Type of Blood / Cross match.
→ Electrolytes. ⚠ Hypochloremic Hypokalemic metabolic alkalosis ⚠ Hypovolemia
→ If there's stool: Stool analysis (↳ vomit)
(Chemo occult blood test).

Imaging
→ CT with contrast ↗ Gastrografin ✓ ↘ Barium ✗
→ Abdominal X-ray → Supine + Erect
Air-fluid levels (Step ladder appearance)
→ Chest x-ray → Air under diaphragm (perforation).
→ Enteroclysis (imaging w/ contrast).
→ Ultrasound.

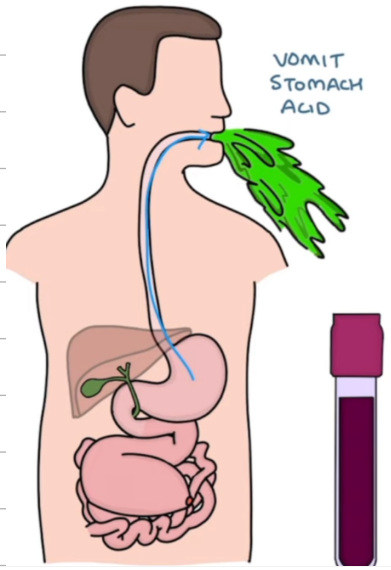
→ Complications of SBO

- → Perforated bowel.
- → Sepsis : Bacterial translocation / gangrene
- → Aspiration
- → Intra abdominal **abscess** (not able to be drained).
- → Short bowel syndrome (multiple surgeries of resection).
- → Strangulation ⅋ cut off blood supply
  - ↳ In cases of closed loop obstruction
    - ↳ colon tumor with competent ileocecal valve
    - ↳ Hernia
    - ↳ volvulus

(should always be checked)

Alarming Signs:

- Fever
- Leukocytosis
- Peritoneal signs.
- Tachycardia
- Shock (hypovolemic)
- Change in pattern of pain
- Acidosis.
  - ↳ ⚠ Ischemia



INITIAL MANAGEMENT

ABCDE APPROACH

MAY BE HAEMODYNAMICALLY UNSTABLE
- ↳ HYPOVOLAEMIC SHOCK ("THIRD-SPACING")
- ↳ BOWEL ISCHAEMIA + Acidosis.
- ↳ BOWEL PERFORATION
- ↳ SEPSIS

FULL SET OF BLOODS
- ↳ ELECTROLYTE IMBALANCES (URE)
- ↳ METABOLIC ALKALOSIS (VENOUS BLOOD GAS)
- ↳ RAISED LACTATE (VENOUS BLOOD GAS) (LAB SAMPLE)

BOWEL ISCHAEMIA

INITIAL MANAGEMENT

"DRIP AND SUCK"

→ NIL BY MOUTH (NPO) Nothing per os.

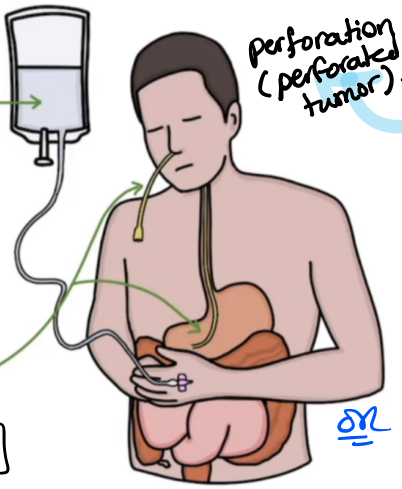
→ IV FLUIDS
- ↳ HYDRATE
- ↳ CORRECT ELECTROLYTE IMBALANCES

→ NG TUBE WITH FREE DRAINAGE
- ↳ ↓ RISK VOMITING + ASPIRATION

for decompression.

→ Water soluble contrast (gastrografin) → aid at bowel movement.

⊕ Steriods in cases of IBD



Otherwise Surgery is the treatment approach.

Open: in strangulating cases OR Laparascopic

Electrolyte imbalance should be corrected asap as hypokalemia can cause paralytic ileus

Note: Mechanical obstruction ⊕ (on top of it) paralytic ileus → Bowel fatigue.

Functional → Ileus, Paralytic, Adynamic

Intestinal hypomotility without obstruction = decreased motor activity

Causes:

→ Peritonitis

→ Postoperative ileus (long procedure, no post-op mobility, extensive manipulation of SB) → (also due to insertion of mesh, restricting approximation & motion).
Small bowel regains function before large bowel

→ Electrolyte imbalance → Hypokalemia.

→ Medications: Anesthetics → Anticholinergics, Narcotics, Sedatives

→ Spinal cord injury.

→ Retroperitoneal hemorrhage.

→ Inflammatory intra-abdominal process
↳ like when there's pancreatitis → the corresponding small bowel segment is paralytic.

→ Acidosis (DKA)

→ Hypoperfusion, Hypoxia, Stress.

→ Idiopathic.

→ Clinically → diminished bowel sounds
No abdominal pain
otherwise, vomiting & constipation & distension (same as mechanical)

→ Management: NPO, NGT, IV fluids, prokinetic drugs, cholinergics
Bowel Rest

Neostigmine — Metoclopramide

or give Erythromycin

Laplace Law.

tension in the wall of sphere = pressure × radius / thickness.

↳ inversely proportional to the thickness.

⇒ Large Bowel Obstruction

Mechanical

Most common causes:

- ✱ Neoplasm / Malignancy
- ✱ Volvulus. (sigmoid / cecal).
- ✱ Stricture. (crohn's, ischemic). (Inflammatory process)
- ✱ Impaction. (fecal).
- ✱ Intussusception. (at the ileocecal junction).

closed loop obstruction (volvulus) → accelerates the complications.

✱ third space loss → leads to: Electrolyte imbalance •
Dehydration •
Hypovolemic shock •

✱ Dilated proximal bowel loops → ↑↑ pressure on walls → ischemia ← ↓↓ arterial supply ← Edema ← ↓ venous drainage
↳ ↑↑ perforation → peritonitis

- **Largest Diameter:** The cecum has the widest diameter of any part of the colon. According to Laplace's Law, pressure is inversely proportional to the radius of a hollow organ. Therefore, the cecum is subject to higher wall tension when distended, increasing the risk of perforation.
- **Thin Muscular Wall:** The cecum has a relatively thinner muscular layer compared to other colonic segments, which makes it structurally weaker and less resistant to increased intraluminal pressure.

Most common site to perforate → Cecum

Most common site for volvulus formation → Sigmoid.

long mesentry and narrow mesentric base.

Causes are age related

Elderly

↑ IOS: Malignancy

Children

Imperforate anus
Hirschprung disease
:

Intussusception.

Entero Colic

Ileo cecal
or Ileocolon

Colocolic

colocolic
sigmoidorectal.

Reduction: via air (pneumatic) → 1° Int
or contrast (Hydrostatic)

Surgery. → 2° Int

Functional LBO

↳ Ogilvie Syndrome / Acute Colonic Pseudo-Obstruction.

* No seen lesion obstructing the colon.
* Autonomic Imbalance: ↓ parasympathetic ↑ Sympathetic
  - ↳ loss of peristalsis
  - ↳ Air & fluid accumulation

⚠ Complications:
- → Perforation
- → Ischemia.