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# ***Principles of Management of Intestinal obstruction***

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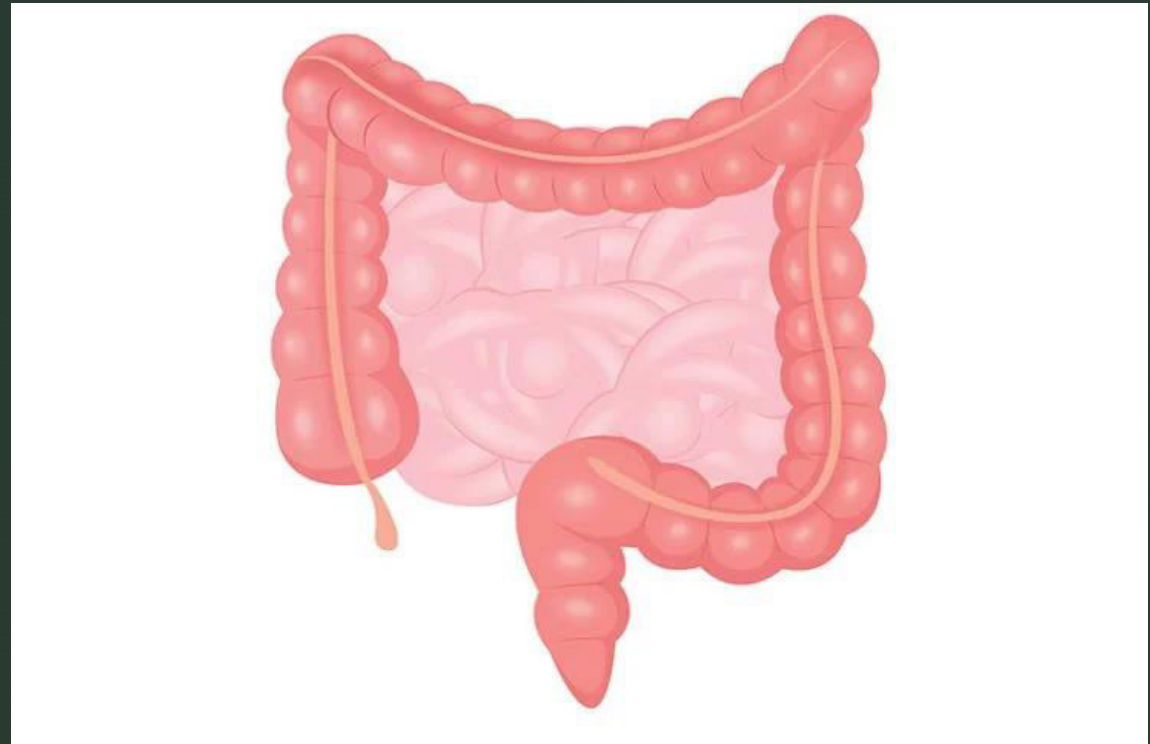
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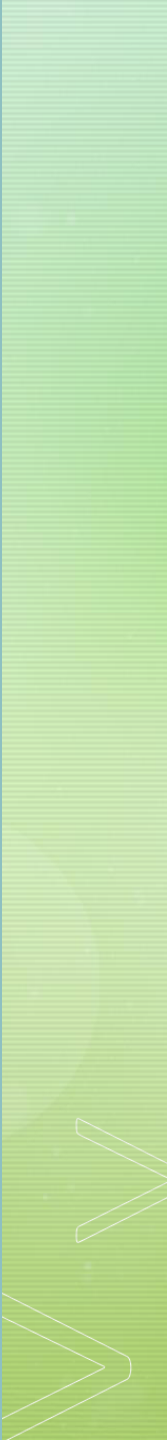
# Outlines

- Definition
- Etiology
- Pathophysiology
- Classifications
- Clinical features
- Investigations
- Management





## Definition

- Any condition that interferes with normal propulsion and passage of intestinal contents.**
  - Accounts for 5-15% of all surgical admissions.**
  - Patients are often extremely ill, requiring immediate assessment, resuscitation and intensive monitoring.**
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# Etiology

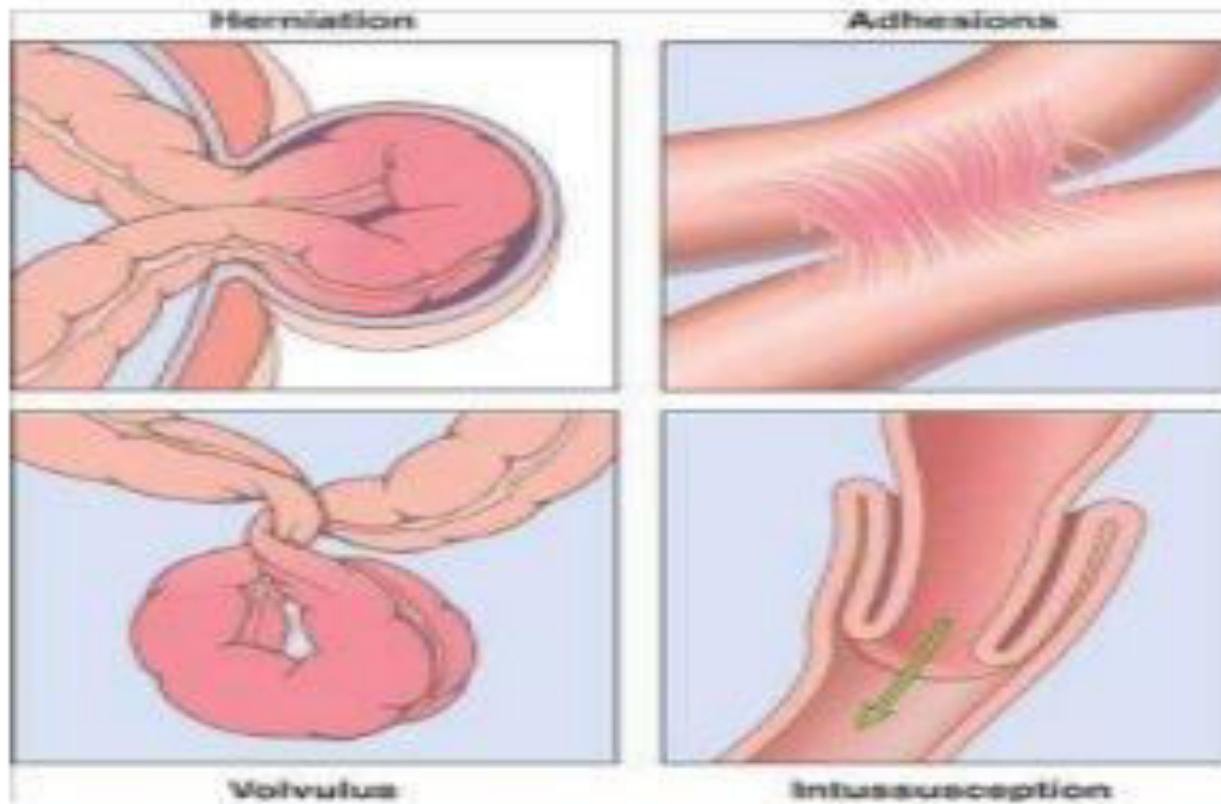
-classified according to Etiology :

- **Dynamic (mechanical):**

There is peristalsis working against mechanical obstruction .

- Adhesion
- Malignancy
- intussusception
- Hernia
- Volvulus

# Dynamic Obstruction





- **-A-dynamic ( non-mechanical):**

Absent or inadequate peristalsis .

- Paralytic ileus
- Mesenteric vascular occlusion
- Pseudo-obstruction ( Neuro-muscular, Hirschsprung's disease ).

# Paralytic ileus

## **Causes of ileus**

- Post laparotomy
- Metabolic and electrolyte derangements: hypokalemia, hyponatremia, hypomagnesaemia, uremia, diabetic coma
- Drugs: opiates, psychotropic agents, anti cholinergic agents
- Intra abdominal inflammation & sepsis
- Retroperitoneal hemorrhage or sepsis
- Intestinal ischemia
- Systemic sepsis

Decreased intake  
Vomiting

PROXIMAL DILATATION

DISTAL COLLAPSE

Swallowed  
air

Distension

Increased  
peristalsis

Gas from fermentation

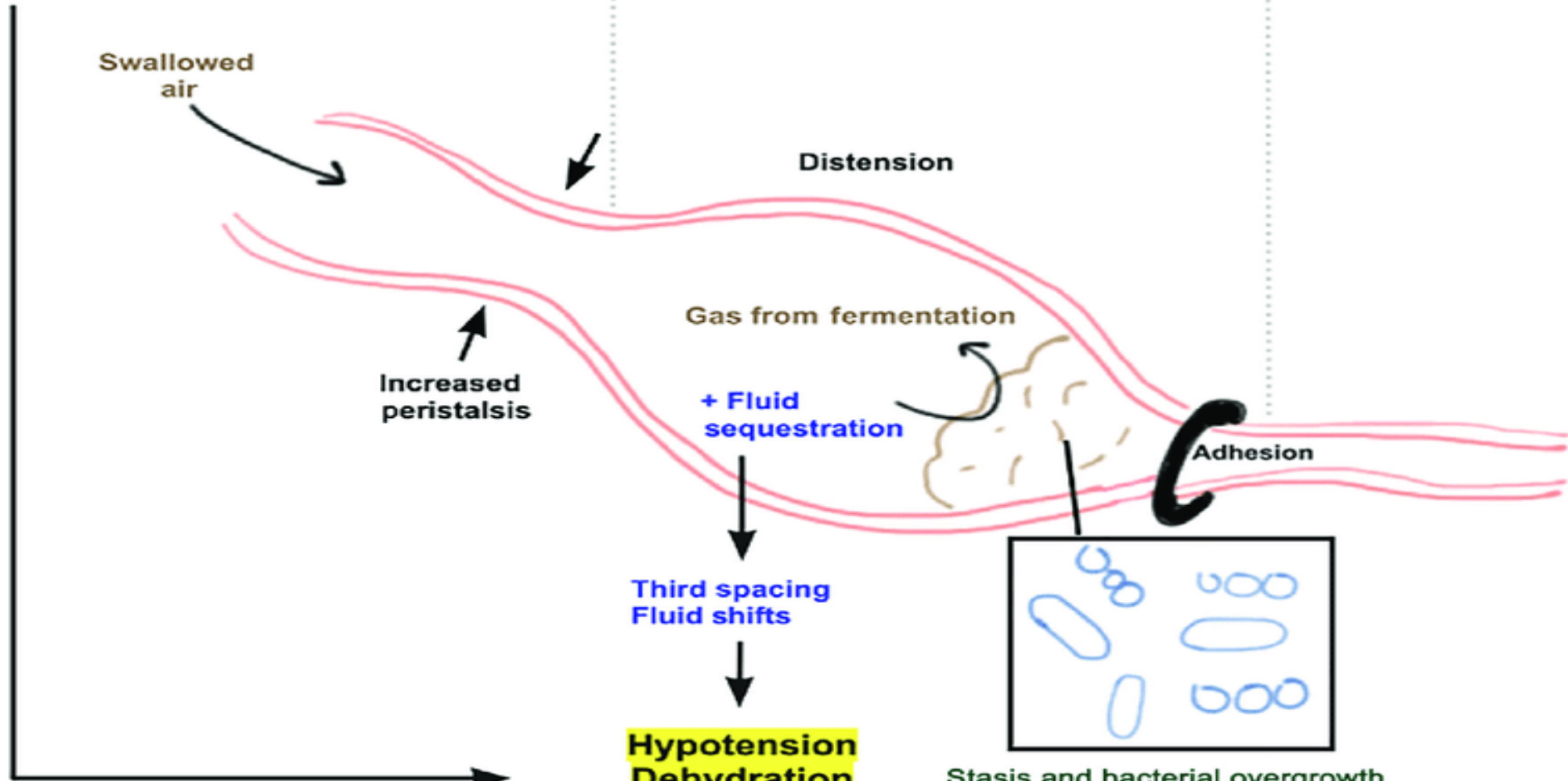
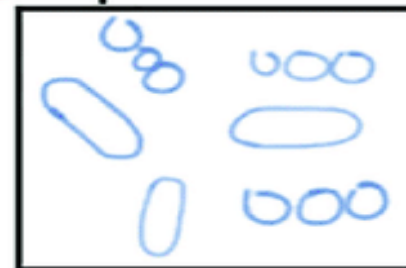
+ Fluid  
sequestration

Adhesion

Third spacing  
Fluid shifts

Hypotension  
Dehydration  
Electrolyte depletion

Stasis and bacterial overgrowth



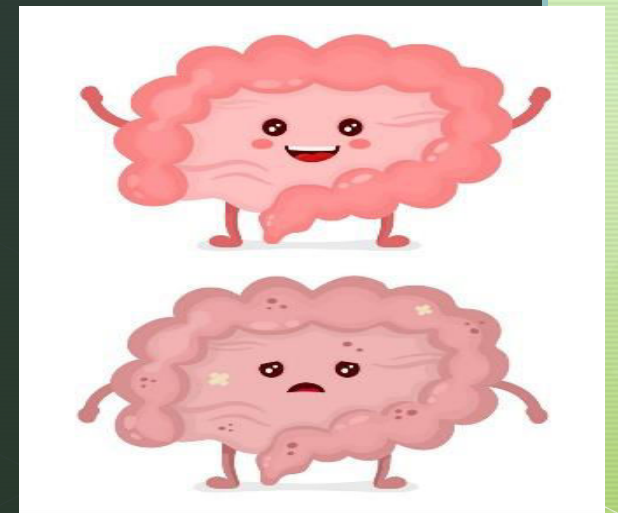


# Pathophysiology

- Irrespective to etiology or acuteness of onset in Dynamic obstruction , The bowel proximal to obstruction will dilate, and bowel distal to obstruction will exhibit normal peristalsis until it becomes empty then it will collapse.
- Initially in proximal bowel ( peristalsis increases to overcome the obstruction...continue to dilate....reduce peristaltic strength ..... flaccidity and paralysis.
- Distention occur by (gas, fluid):
  - Gas :aerobic and anaerobic bacterial growth.
  - Fluid :digestive juices and retarded absorption.

# Dehydration occurs due to :

- reduce oral intake.
- electrolytes depletion .
- Vomiting. ▽
- sequestration of bowel lumen fluid.



## *Other classifications*

-Small Vs Large bowel....

### **\*Small bowel obstruction :**

Adhesion

Hernia

Malignancy

Intussusception

Inflammatory bowel disease (Crohn's disease)

### **\*Large bowel obstruction :**

Colon cancer

Adhesion

Volvulus

Hernia

Chronic diverticulitis



**-Acute Vs subacute.**

**-Partial Vs complete .**

**-Simple Vs complex (closed loop/strangulated ).**



## Clinical features

-Based on classic quarter of :

**Abdominal pain**

**Abdominal distention**

**Nausea and Vomiting**

**constipation**

Clinical features may be influenced by whether obstruction complete or partial.

And vary according (location, duration, pathology of the obstruction and presence or absence of ischemia).

# Abdominal pain



Abdominal pain is the first symptom.

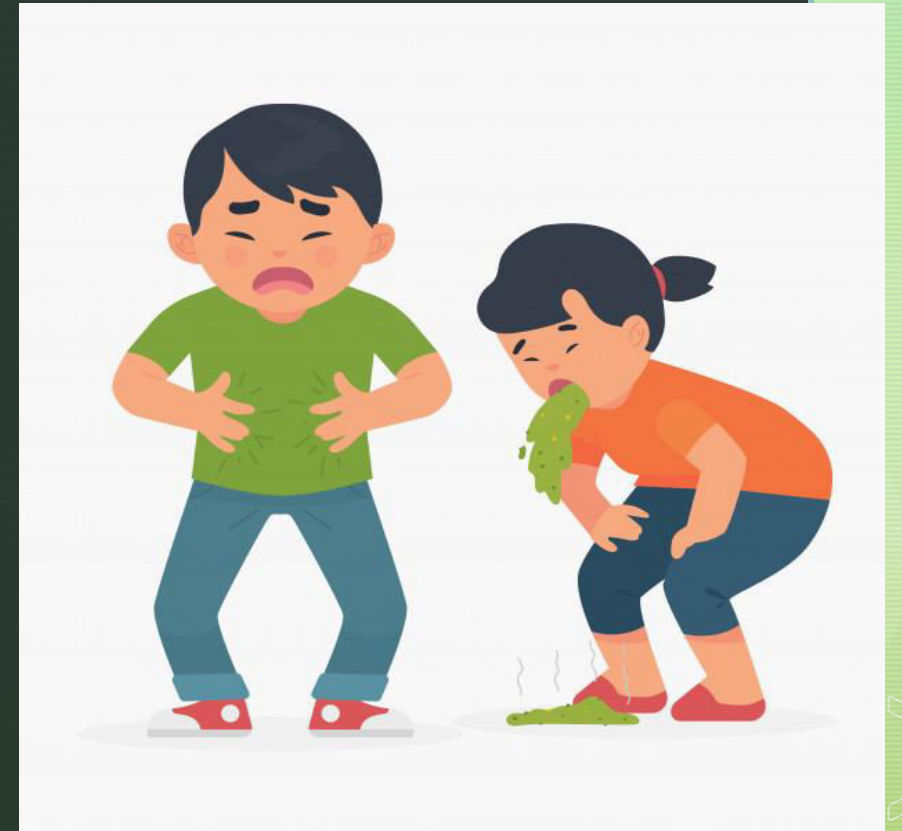
In ***small bowel obstruction***, the pain tends to be colicky (cramping and intermittent) in nature, with spasms lasting a few minutes. The pain tends to be central and mid-abdominal. Vomiting may occur before constipation.

In ***large bowel obstruction***, the pain is felt lower in the abdomen and the spasms last longer. Constipation occurs earlier and vomiting may be less prominent.

- With increasing the distention , the pain becomes constant, Diffused.
- If sever continuous pain .....you have to rule out strangulation .

# Vomiting

The character of vomitus alter from digested food (bilious) to a Feculent vomiting .



# Abdominal Distention

The degree of Distention depend on site of obstruction and is greater in the more distal lesions.

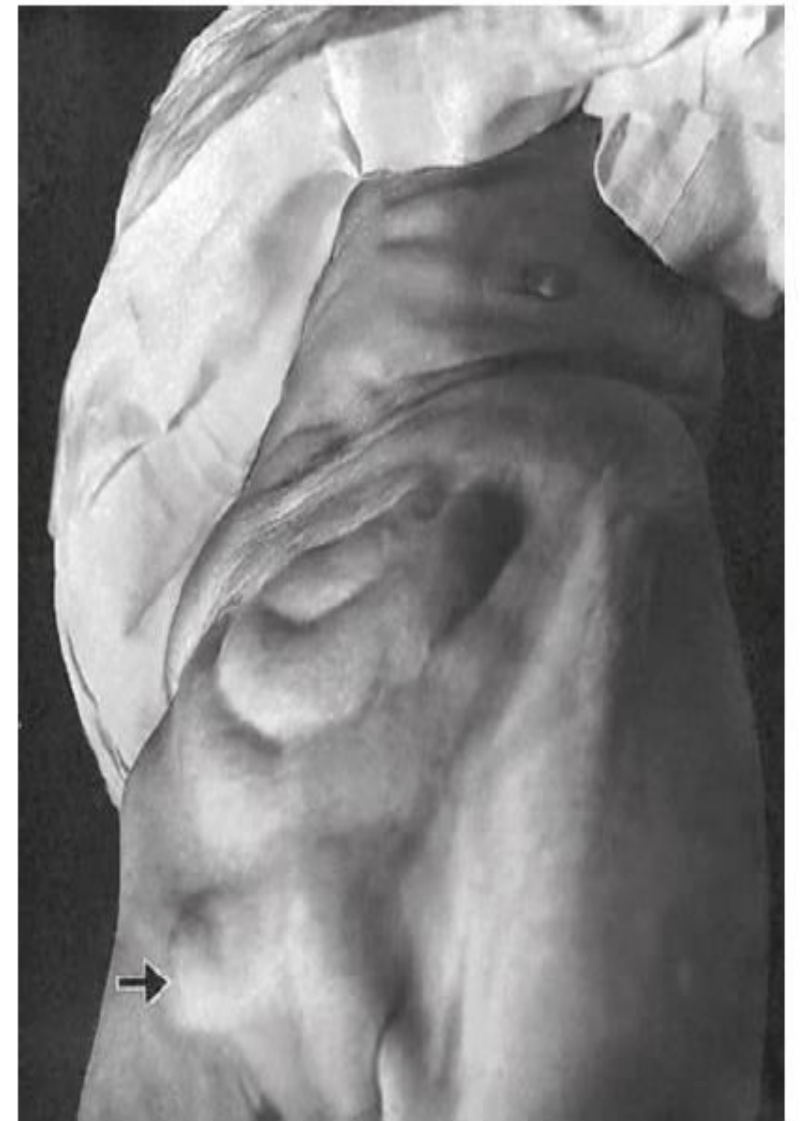


Figure 70.7 Visible peristalsis. Intestinal obstruction due to a strangulated right femoral hernia, to which the arrow points.



# Constipation

-**Obstipation** :neither feces nor flatus is passed . ( cardinal feature of complete bowel obstruction).

-**Constipation**: where only flatus is passed.



# Complications

- Bowel infarction
- Bowel perforation
- Peritonitis
- Intra-abdominal abscess
- Septic shock
- Hypovolemic shock



# History & Physical Examination

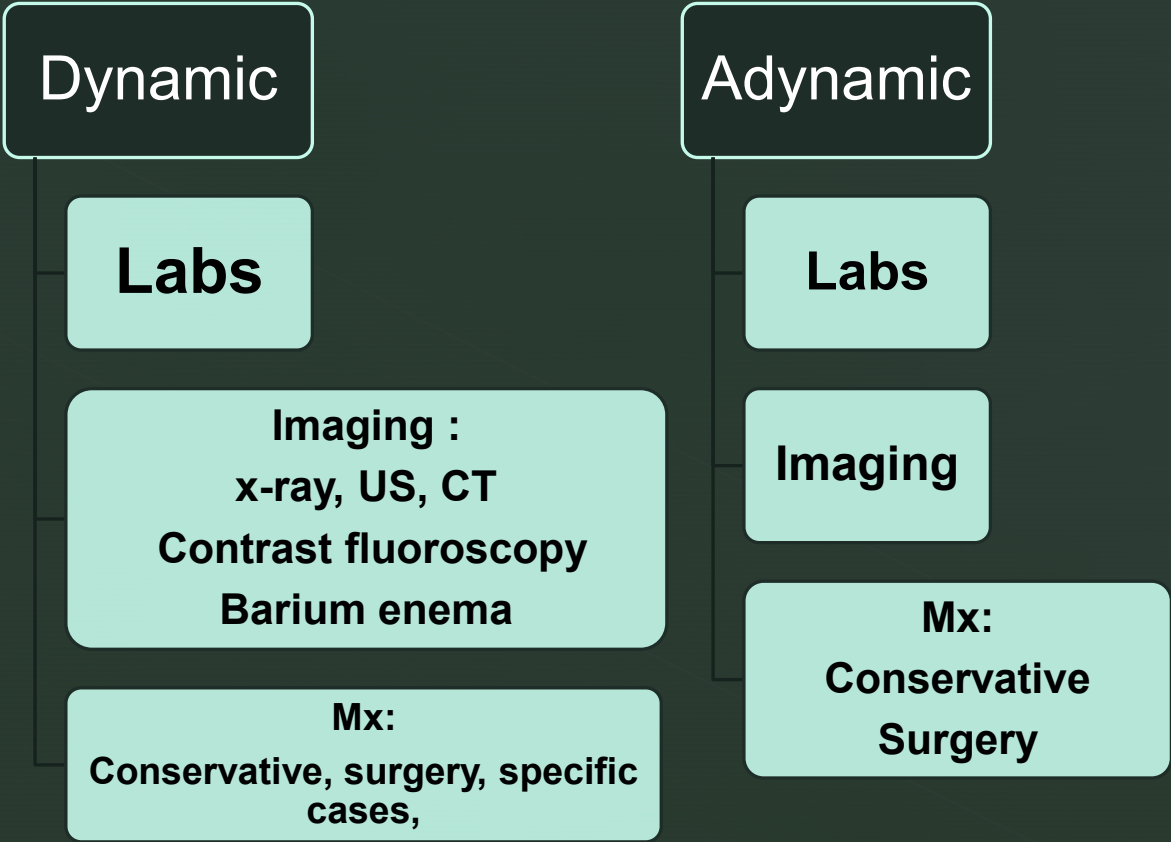
## History :

- symptoms ( abdominal pain, nausea and vomiting, constipation ..etc).
- previous bowel obstruction.
- previous abdominal or pelvic surgery.
- Hx of malignancy.
- Drug Hx .

# Physical examination

- General examination
- Vital signs
- Hydration status
- Abdominal examination
- Hernia examination
- PR examination

# Intestinal Obstruction



# Investigations

## **\*\*Labs:**

-CBC: HB, WBC, platelet.

-Electrolytes:

hypokalemia

Hyponatremia

hypochloremia

-Kidney function test

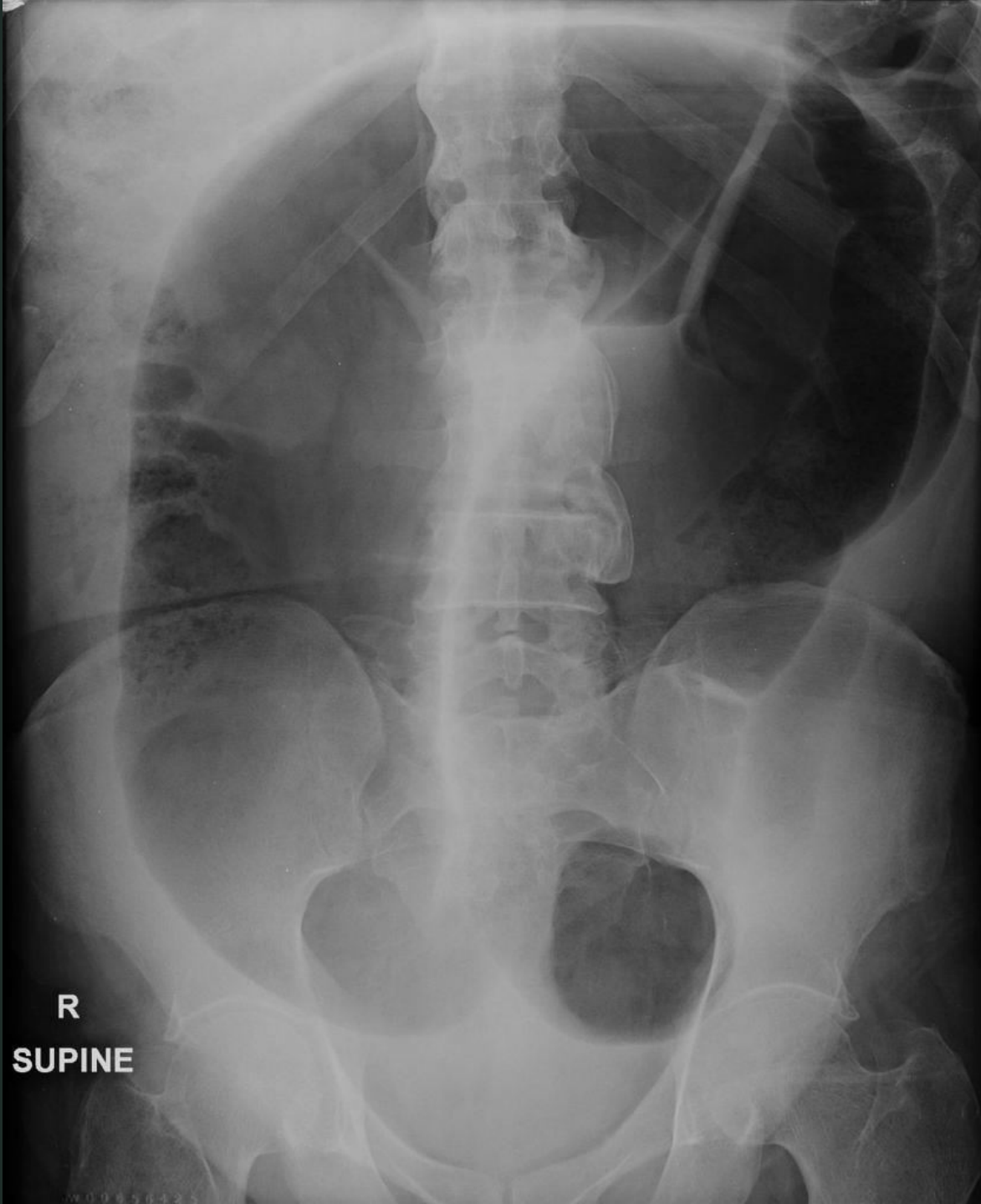
-Urinalysis

# Intestinal Obstruction

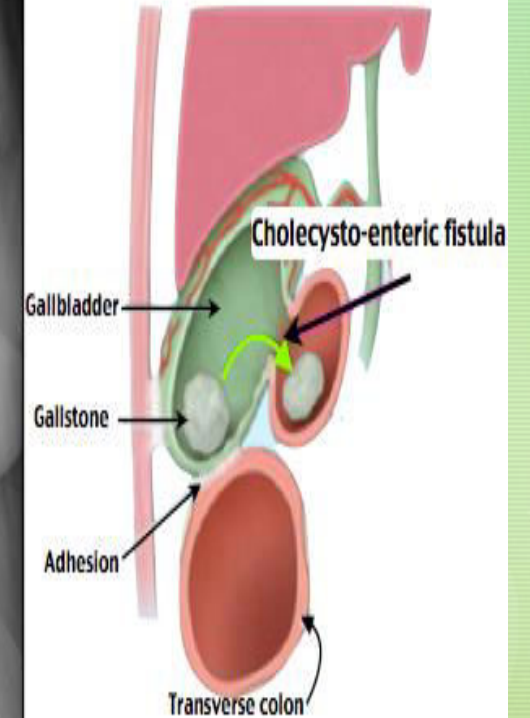
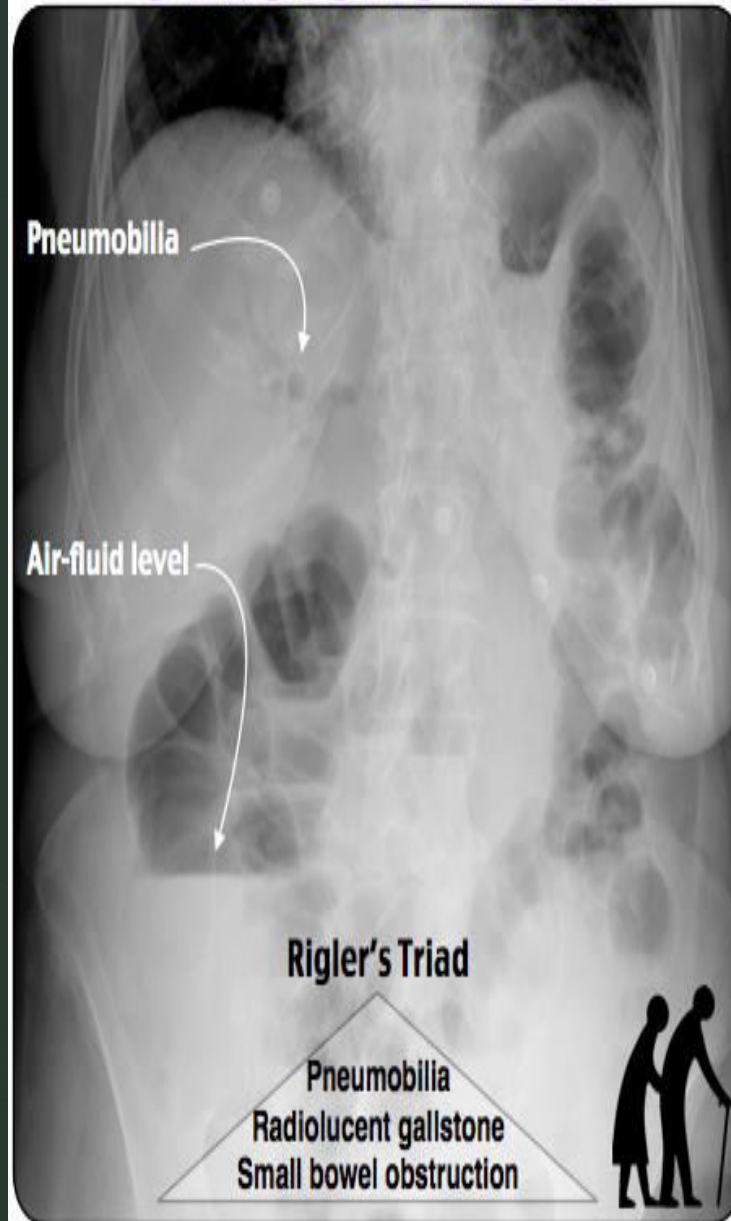
## Imaging

When evaluating Abdominal radiographs (continue)

- Is there a paucity of distal colonic gas or an abrupt cutoff of colonic gas with proximal colonic distention and air-fluid levels (suggestive of complete or near-complete colonic obstruction).
- Is there evidence of strangulation (e.g., thickened small bowel loops, mucosal thumb printing, pneumatosis cystoides intestinalis, or free peritoneal air)?
- Is there massive distention of the colon, especially of the cecum or sigmoid (suggestive of either volvulus or pseudo-obstruction).
- Are there any biliary or renal calculi, and is there any air in the biliary tree (suggestive of gallstone ileus or a renal stone that could be causing ileus)?



# Gallstone Ileus\*



\*Ileus is a misnomer since "ileus" is defined by a non-mechanical cause of small bowel motility failure



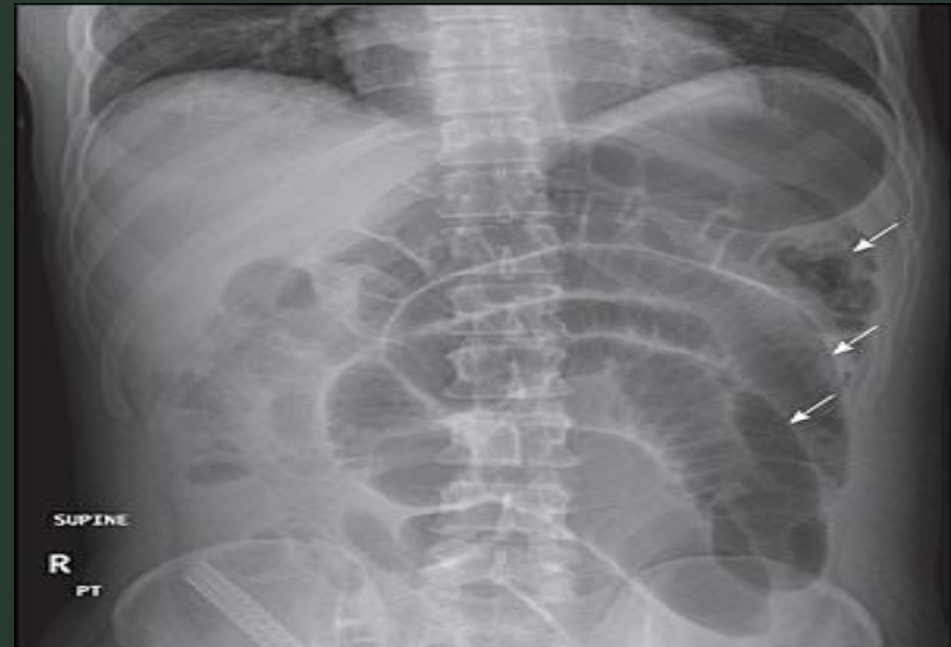
# IMAGING

Initially: x-ray ●

Lateral decubitus :



supine: ●



# Intestinal Obstruction

## Adjunct Tests for Equivocal Situations

### U/S

- Simultaneous observation of distended and collapsed bowel segments
- Free peritoneal fluid
- Highly reflective fluid within bowel lumen
- Bowel wall edema



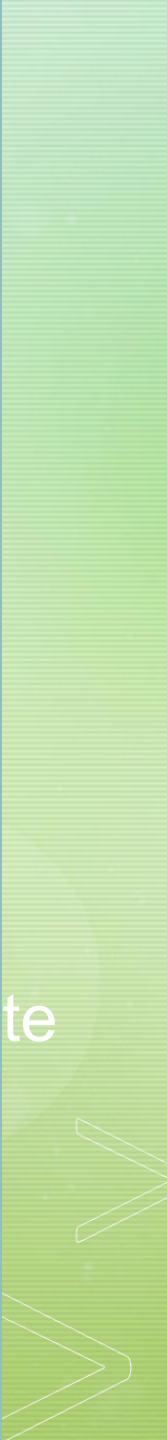
# Ct scan

## **Indications**

With IV and oral contrast: Best initial test in hemodynamically stable patients with suspected partial bowel obstruction

With IV contrast: Indicated in patients with suspected complete bowel obstruction.

Non-contrast: Indicated in patients with contrast allergy and suspected complete bowel obstruction



## Intestinal Obstruction

### CT scan

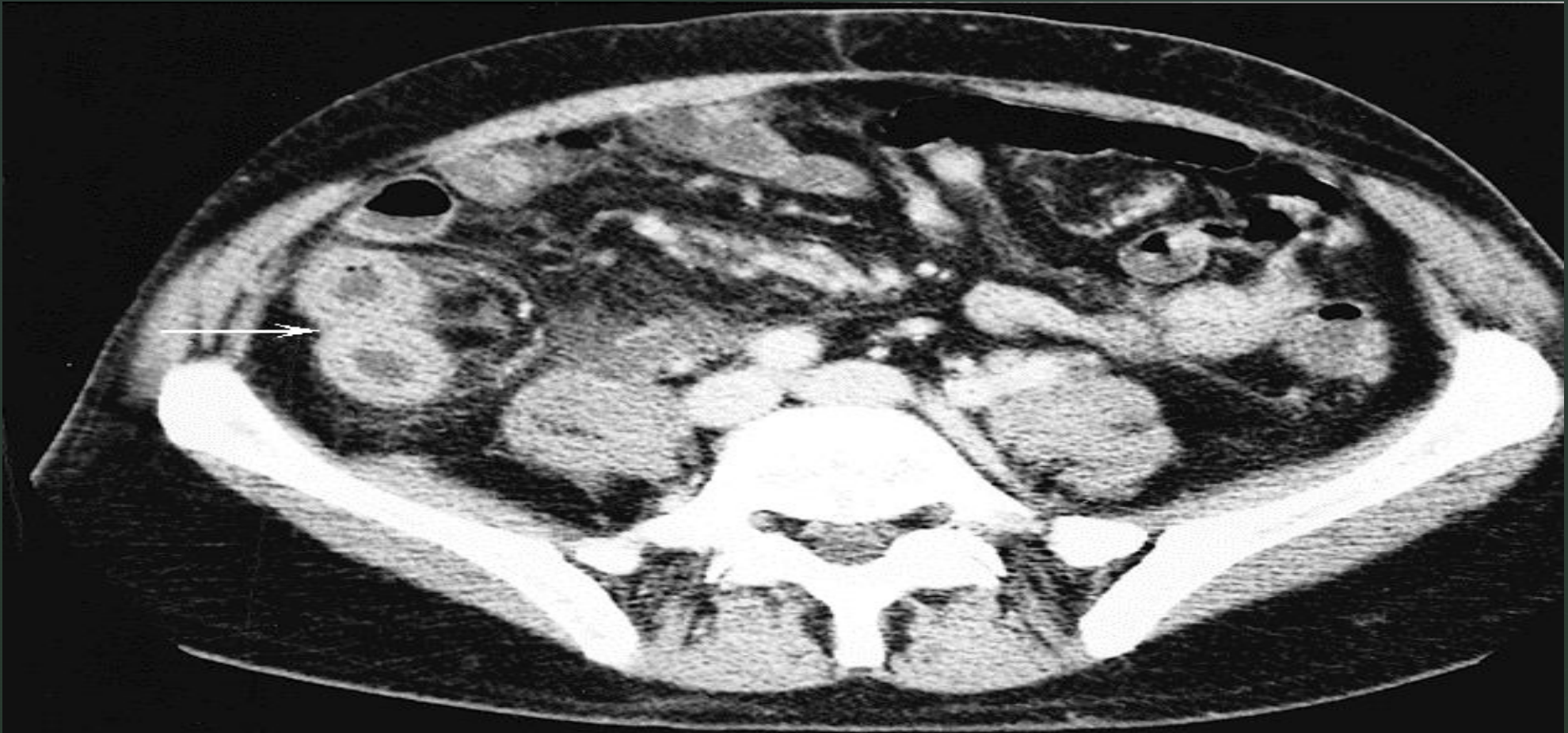
- Ascertain the level of obstruction
- Assess the severity of obstruction and determine the cause of obstruction
- Detect closed loop obstruction and early strangulation
- Detect inflammatory processes
- Detect small amounts of pneumatosis cystoides intestinalis

Intestinal Obstruction



## Intestinal Obstruction

- CT scan: early closed-loop small bowel obstruction



## CT with water-soluble contrast

---Absence of contrast material in the rectum is also an important sign of complete obstruction!

\*\*A C-loop of distended bowel is highly suspicious for intestinal volvulus

\*\*Thickened intestinal walls and poor flow of contrast material into a section of bowel suggests ischemia, whereas pneumatosis intestinalis, free intra-peritoneal air, and mesenteric fat stranding suggest necrosis and perforation

# Barium enema

**Indication:** in suspected distal LBO

**Findings** Tapering of bowel lumen at the site of obstruction

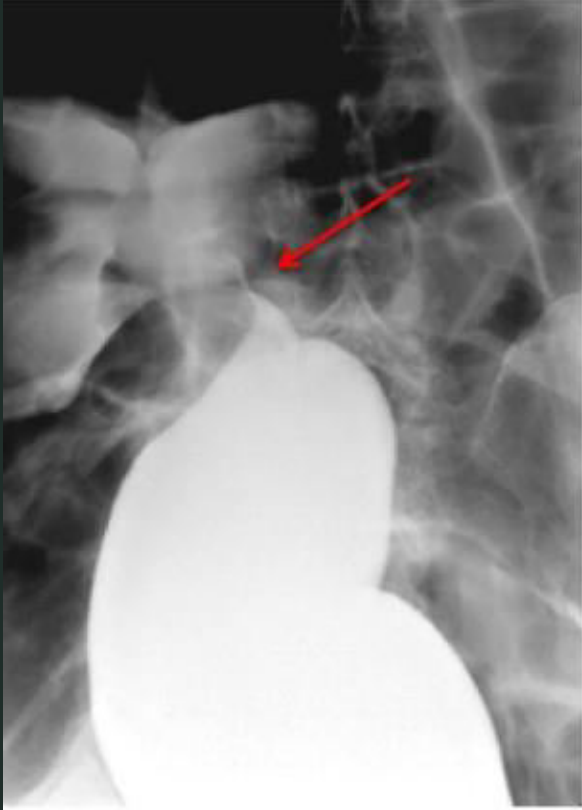
Complete bowel obstruction: contrast would not be visible beyond obstruction

Partial bowel obstruction: a trickle of contrast would be visible beyond obstruction

**Bird beak sign** seen in **volvulus**

**Apple core sign** seen in **colonic malignancy**



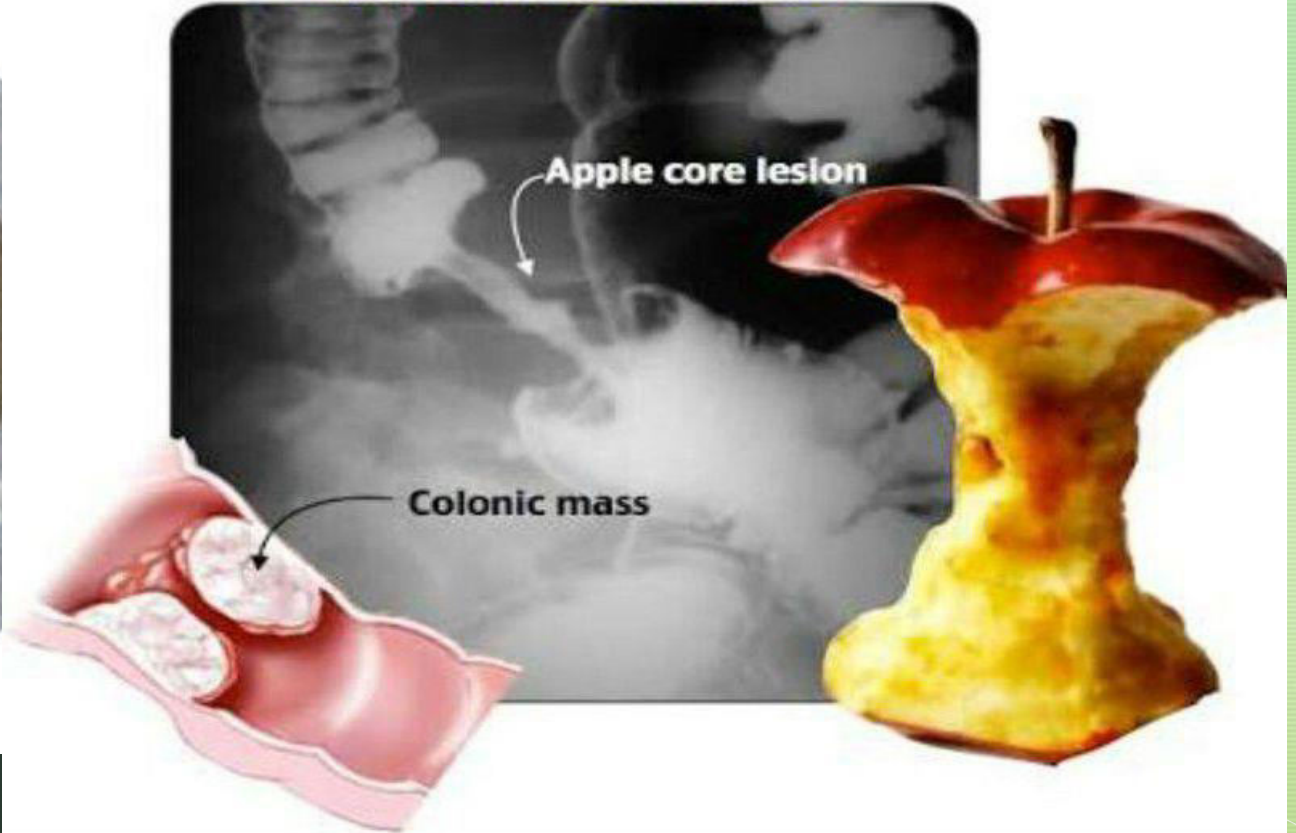


A



B

## Colon Cancer



## ▶ DANGEROUS SIGNS (Red Flags)

- Constant pain
- Absent bowel sounds  
“strangulation”
- Tenderness with rigidity
- Leukocytosis
- Fever and tachycardia
- Shock

# Treatment



Three main measures-

- GI drainage
- Fluid & Electrolyte replacement
- Relief of obstruction, usually surgical

## ➤ Nonstrangulated obstructions:

- can be treated nonoperatively (conservative) if the patient is clinically stable.
- adequate fluid resuscitation to achieve a urine output of at least 0.5 mL/kg/hour.
- Intestinal decompression: nasogastric tube insertion
- Bowel rest (NPO)
- Administration of IV analgesics and antiemetics
- Foley's catheter
- During nonoperative management, the patient must be observed closely and undergo abdominal examinations every 4 to 6 hours (monitor abdominal girth and tenderness)
- If the patient at any time (develops shock or peritonitis) or fails to improve within a few days, laparotomy is indicated.

# Treatment

## Indication for surgery:

- failure of conservative management
- tender, irreducible hernia
- Strangulation
- Suspected bowel obstruction and hemodynamic instability or features of sepsis
- Complete bowel obstruction with signs of ischemia/necrosis
- Persistent partial obstruction (> 3–5 days)
- Closed-loop obstruction



## surgery

If the site of obstruction is unknown; laparotomy assessment is directed to-

- The site of obstruction.
- The nature of obstruction.
- The viability of gut.

	<b>VIABLE</b>	<b>NON-VIABLE</b>
<b>CIRCULATION</b>	Dark color becomes lighter	Dark color remain
	Visible pulsation in mesenteric arteries	No detectable pulsation
<b>GENERAL APPEARANCE</b>	Shiny	Dull and lusterless
<b>INTESTINAL MUSCULATURE</b>	Firm	Flabby, thin and friable
	Peristalsis may be observed	No peristalsis



## Operative intervention:

- After full resuscitation the abdomen should be opened through a midline incision
- a standard groin incision can be used in the case of an inguinal or femoral hernia.
- During the exploration and identification of the origin of obstruction, adhesiolysis is usually required
- If an obstructing lesion cannot be resected, an enteroenteric or enterocolonic anastomosis can bypass the area of obstruction.
- Placement of a gastrostomy tube for postoperative decompression should be considered in specific cases, such as carcinomatosis or unresectable obstructing cancer.





After obstruction is removed, the bowel is inspected for viability. If non-viable, resection is required.

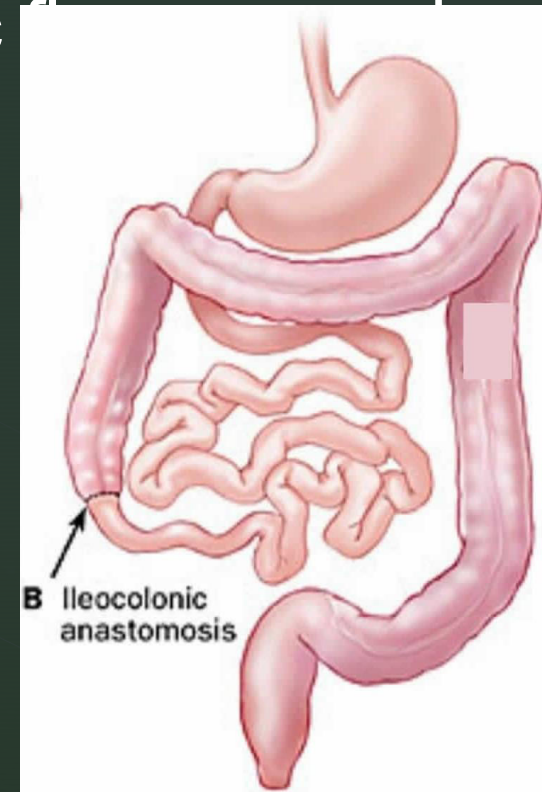
To check for viability intra-op, as sometimes the bowel is purple not black (gangrenous) or pink (healthy viable).

surgeon dips gauze in warm saline, places it on the purple (uncertain) bowel, and asks the anesthesiologist to increase o<sub>2</sub> saturation

And monitor if the bowel tissue return to pink then no resection, but if the bowel stayed purple or turned black then resect

Small bowel segments can be resected with primary anastomosis of proximal and distal segments because of extensive blood supply.

Large bowel segments proximal to the splenic flexure can be resected with primary ileocolic anastomosis.



# PLAN

- IV fluids and electrolytes resuscitation for all
- NG tube if repeated vomiting
- Antibiotics ?
- Hernia -> Operation
- Adhesions -> Conservative first
- Obstruction -> Remove
- Volvulus -> Derotate and/or operate
- Mesenteric ischemia -> Operate
- Abscess or peritonitis -> Drain and treat



## Special cases

Sigmoid volvulus with no signs of strangulation: rigid/flexible sigmoidoscopic detorsion

### PARALYTIC ILEUS

NG suction, fluid replacement

Use prokinetics (erythromycin) in resistant case

Laparotomy - if inactivity persists > 7 days, only after confirmation of abdominal sepsis / mechanical obstruction



Thank you

