

Intestinal obstruction

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Definition

- Any condition interferes with normal propulsion and passage of intestinal contents.
- Can involve the small bowel, colon or both small and colon as in generalized ileus.



Definitions

- 5% of all acute surgical admissions
- Patients are often extremely ill requiring prompt assessment, resuscitation and intensive monitoring

Obstruction a mechanical blockage arising from a structural abnormality that presents a physical barrier to the progression of gut contents.

Ileus a paralytic or functional variety of obstruction

Obstruction:	Partial or complete
	Simple or strangulated

Epidemiology

- 1 % of all hospitalization
- 3-5 % of emergency surgical admissions
- More frequent in female patients - gynecological and pelvic surgical operations are important etiologies for postop. adhesions
- Adhesion is the most common cause of intestinal obstruction
- 80% of bowel obstruction due to small bowel obstruction - the most common causes are:
 - Adhesion
 - Hernia
 - Neoplasm
- 20% due to colon obstruction - the most common cause:
 - CR-cancer 60-70%,
 - diverticular disease and volvulus - 30%
- Mortality rate range between 3% for simple bowel obstruction to 30% when there is strangulation or perforation
- Recurrent rate vary according to method of treatment ;
 - conservative 12%
 - surgical treatment 8-32%

Classification

- Cause of obstruction: mechanical or functional.
- Duration of obstruction: acute or chronic.
- Extent of obstruction: partial or complete
- Type of obstruction: simple or complex (closed loop and strangulation).

CLASSIFICATION

DYNAMIC (MECHANICAL)

Peristalsis is working against a mechanical obstruction

ADYNAMIC (FUNCTIONAL)

Result from atony of the intestine with loss of normal peristalsis, in the absence of a mechanical cause.

or it may be present in a non-propulsive form (e.g. mesenteric vascular occlusion or pseudo-obstruction)

Etiology

□ Mechanical bowel obstruction:

A. Small bowel obstruction:

1. Adhesion 60%
2. Hernia 20%
3. Neoplasm 5%
4. Volvulus 5%
5. Others: IBD-GALL STONE-FOREIGN BODY-INTUSSUSCEPTION

B. Large bowel obstruction:

1. Cancer 60%
2. Diverticular disease 15%
3. Volvulus 15%
4. Others: hernia –fecal impaction-inflammatory

Etiology

❑ Functional bowel obstruction: 3 types

- A. Vascular occlusion ileus.
- B. Spastic ileus. (intestine remain contracted and no propulsive) causes are:
 - 1. Uremia.
 - 2. Porphyrria.
 - 3. Heavy metal poison.
- C. Adynamic or inhibition ileus:
 - 1. Post operation mostly after abdominal surgery
 - 2. Metabolic causes: hyponatremia-hypokalemia – hypomagnesaemia.
 - 3. Drugs: morphine - antacid-anticonvulsant.
 - 4. Intra-abdominal inflammation – sepsis – occult wound infection.
 - 5. Pneumonia – renal stone – retroperitoneal hematoma – fracture spine and ribs

Etiology according to age

Neonates:

- congenital atresia
- volvulus neonatorum
- anorectal malformation
- meconium ileus and Hirschsprung's disease

Infants:

- ileocaecal intussusception
- Hirschsprung's disease
- strangulated hernia

Adult:

- adhesion
- strangulated hernia

Elderly:

- colon carcinoma
- adhesion
- strangulated hernia -

CAUSES OF I.O (DYNAMIC)

Intraluminal

- Impaction
- Foreign bodies
- Bezoars
- Gallstone

Intramural

- Congenital atresia
- Stricture
- Malignancy (15%)

Extramural

- Bands/ adhesion (40%)
- Hernia (12%)
- Volvulus
- Intussusception
- Tumor-
benign/malignant

Pathophysiology:

Proximal bowel dilated
& develops altered
motility → dilate →
reduce peristaltic
strength → flaccidity &
paralysis (prev. vascular
damage due to inc.
intraluminal pressure)

Distal to obs.
Bowel exhibits
normal peristalsis
& absorption →
become empty →
contract &
become immobile

Distention is by
gas & fluid

-Gas: aerobic &
anaerobic
growth

-Fluid: Digestive
juices &
retarded
absorption

Dehydration &
electrolytes loss:
Reduced oral
intake, defective
intestinal
absorption, losses
from vomiting &
sequestration in
bowel of lumen.

Pathophysiology

- 8L of isotonic fluid received by the small intestines (saliva, stomach, duodenum, pancreas and hepatobiliary)
- 7L absorbed
- 2L enter the large intestine and 200 ml excreted in the faeces
- Air in the bowel - swallowed air (O_2 & N_2) and bacterial fermentation in the colon (H_2 , Methane & CO_2),
- 600 ml of flatus - released
- Enteric bacteria: coliforms, anaerobes and strep. faecalis.
- Normal intestinal mucosa - significant immune role

- Distension - gas and/ or fluid (\uparrow hydrostatic pressure).
- Bowel obstruction - rapid Bacterial overgrowth
- Mucosal barrier breached - translocation of bacteria and toxins resulting in bacteraemia, septicaemia and toxemia.

Functional obstruction

- secondary to factors that cause either paralysis or dysmotility of intestinal peristalsis.
- Postoperative ileus is the most common form
- Postoperative ileus - after intra-abdominal operation
- Postoperative ileus correlates with degree of surgical trauma and type of surgery
- Different anatomic segments of GIT recover at different rates after manipulation and trauma:
 1. Small bowel - hours after operation.
 2. Stomach - 24-48 hrs.
 3. Colon - 3-5 days post op.

Postoperative ileus

- should be differentiated from early postoperative mechanical bowel obstruction:
- Occurs within the first 6 weeks post operation
- Acute adhesions > 90%
- other causes:
 - ❖ Internal herniation
 - ❖ intra-abdominal abscess
 - ❖ intramural hematoma
 - ❖ anastomatic edema and leak

Difficult to differentiate by clinical presentation and X-ray so contrast study and CT scan - helpful

Intestinal Ileus

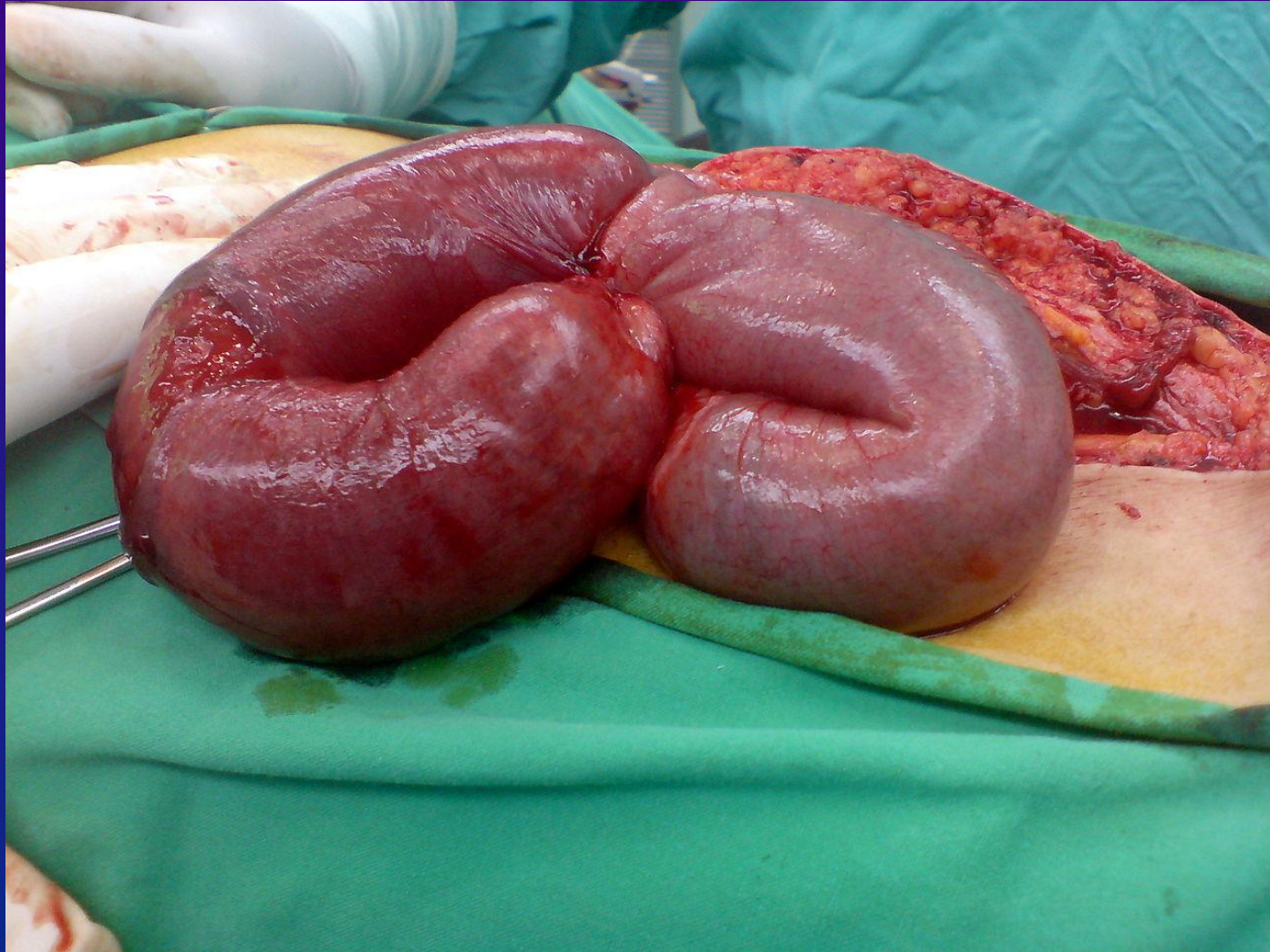
Etiology

- Postoperative State
- Sepsis
- Electrolyte Imbalance
- Drugs
- Ureteral and Biliary Colic
- Retroperitoneal Hemorrhage
- Spinal Cord Injury
- Myocardial Infarction
- Pneumonia

Small Bowel Obstruction

Etiology

- Adhesions
- Malignancy
- External or Internal Hernia
- Volvulus
- Crohn's Disease
- Intra-abdominal Abscess



gallstone





Large Bowel Obstruction

Etiology

- Colon Cancer
- Diverticulitis
- Extrinsic Cancer
- Fecal Impaction
- Intussusception
- Volvulus
- Incarcerated Hernias

Large Bowel Obstruction

Colon Cancer

- 20% of colon cancers present with obstruction
- Left-sided lesions are more prone to obstruct (more narrow lumen, more solid fecal stream)

Colon cancer obstruction



Intestinal obstruction special case: Volvulus

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

When complete - forms a closed loop obstruction → ischemia

Can be primary or secondary:

1°: congenital malformation of the gut

(e.g: volvulus neonatorum, cecal or sigmoid volvulus)

2°: more common, due to rotation of a piece of bowel around an acquired adhesion or stoma

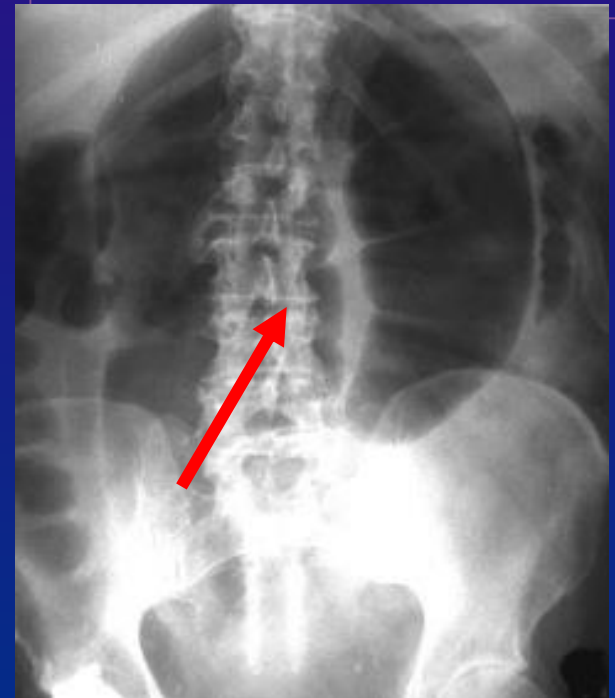
Commonest spontaneous type in adult is **sigmoid**, can be relieved by decompression per anum

Surgery is required to prevent or relieve ischaemia

Features:

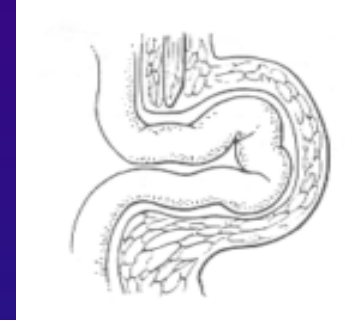
palpable tympanic lump (**sausage shape**) in the midline or left side of abdomen.

Constipation, abdominal distension (early & progressive)



INTESTINAL OBSTRUCTION SPECIAL CASE: HERNIA

- ACCOUNTS FOR 20% OF SBO
- COMMONEST
 1. FEMORAL HERNIA
 2. INGUINAL
 3. UMBILICAL
 4. OTHERS: INCISIONAL
- THE SITE OF OBSTRUCTION IS THE NECK OF HERNIA
- THE COMPROMISED VISCUS IS WITHIN THE SAC.
- ISCHAEMIA OCCURS INITIALLY BY VENOUS OCCLUSION, FOLLOWED BY OEDEMA AND ARTERIAL COMPROMISE.
- ATTEMPT TO DISTINGUISH THE DIFFERENCE BETWEEN:
 - INCARCERATION
 - SLIDING
 - OBSTRUCTION
- STRANGULATION IS NOTED BY:
 - PERSISTENT PAIN
 - DISCOLOURATION
 - TENDERNESS
 - CONSTITUTIONAL SYMPTOMS



Oglive's Syndrome

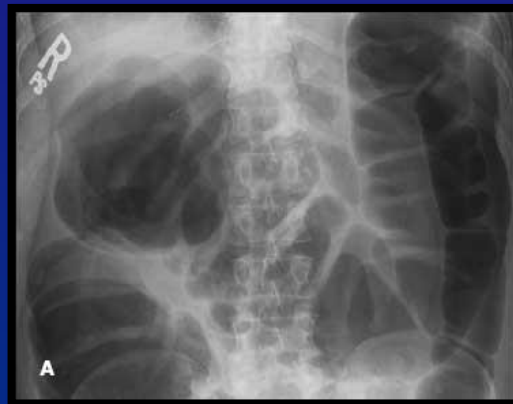
(Colonic Pseudo-Obstruction)

May mimic mechanical obstruction

Associated Conditions

Treatment:

- Rectal tube / enemas / exams (work in most)
- Colonoscopic decompression (80-90% eff.)
- Surgery (Cecostomy vs. Resection) - cecum >12 cm or peritoneal signs



Clinical Features

In High Small Bowel Obstruction

Vomiting occurs early and is profuse with **rapid dehydration**.

Distention is minimal with little evidence of fluid levels on abdominal radiograph.

In Low Small Bowel Obstruction

Pain is predominant with **central Distention**.

Vomiting is delayed. Multiple central fluid levels are seen in abdominal radiograph.

In Large Bowel Obstruction

Distention is early and pronounced.

Pain is mild and **Vomiting** and **Dehydration** is late.

The proximal colon and caecum are distended on abdominal radiograph.

Small Bowel Obstruction

Signs & Symptoms

- Intermittent, Crampy Abdominal Pain
- Nausea / Emesis
- Distension
- Obstipation
- Peristaltic Rushes on Auscultation
- Focal Tenderness
- Diffuse Peritonitis

Large Bowel Obstruction

Diagnosis

- Crampy Pain
- Onset may be acute or insidious
- Distension (50-60% have competent ileo-cecal valve and develop severe distension)
- Xrays: 12-14 cm cecum, perforation risk
- Contrast enema: Obstruction vs Ogilvie's
- Consider sigmoidoscopy to r/o and treat sigmoid volvulus

Diagnosis

❖ History and physical examination:

1. 4 cardinal symptoms (pain-vomiting-distension and obstipation)
2. Proximal obstruction earlier symptoms with prominent vomiting and less distension. While vomiting uncommon in colon obstruction till late stage
3. Location and characteristic of pain differentiate between mechanical obstruction and ileus
 - Severe – cramp and localized in mid of abdomen in mechanical obstruction
 - Diffuse and mild in ileus

Examination:

- Vital signs. (PR-Temp-BP)
- Hydration status
- Abdominal and rectal examinations

Physical examination

- 1/ The patient with intestinal obstruction may present with tachycardia and hypotension, demonstrating the severe dehydration that is present.
- 2/ Fever suggests the possibility of strangulation.
- 3/ Abdominal examination demonstrates a distended abdomen, with the amount of distention some what dependent on the level of obstruction. Previous surgical scars should be noted. Early in the course of bowel obstruction, peristaltic waves can be observed, particularly in thin patients, and auscultation of the abdomen may demonstrate hyperactive bowel sounds with audible rushes associated with vigorous peristalsis (i.e. borborygmi). Late in the obstructive course, minimal or no bowel sounds are noted.
- 4/ Mild abdominal tenderness may be present with or without a palpable mass; however, localized tenderness, rebound, and guarding suggest peritonitis and the likelihood of strangulation.
- 5/ A careful examination must be performed to rule out incarcerated hernias in the groin, the femoral triangle, and the obturator foramen.
- 6/ A rectal examination should be performed to assess for intraluminal masses and to examine the stool for occult blood, which may be an indication of malignancy, intussusception, or infarction.

Diagnosis

Laboratory :

- ☐ CBC: increase PCV (dehydration) and increase in WBC.
- ☐ KFT: increase in BUN and creatinine .
- ☐ Lactate concentration-amylase-lactic dehydrogenase useful
(low sensitivity)
- ☐ ABG: metabolic and respiratory acidosis.

Diagnosis

❖ Radiological : **Upright CXR with supine and upright abdominal radiographs: *initial imaging study.***

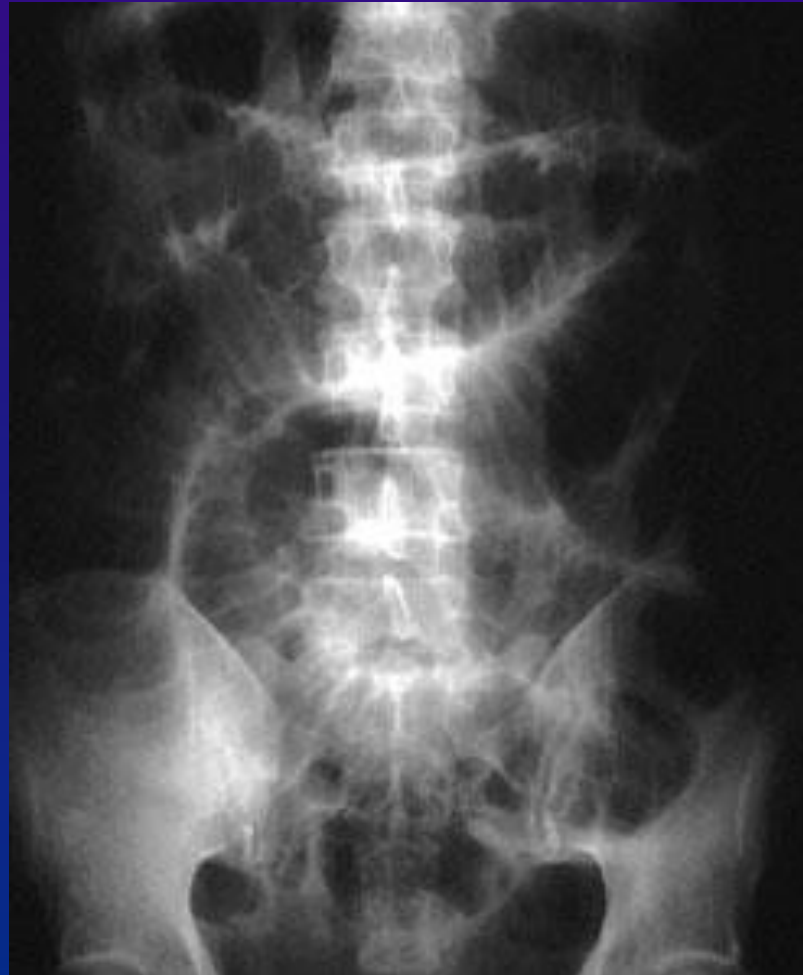
1. CXR :

- » Detect extra-abdominal condition present with bowel obstruction e.g. pneumonia.
- » Presence of pneumoperitoneum - perforated viscus.

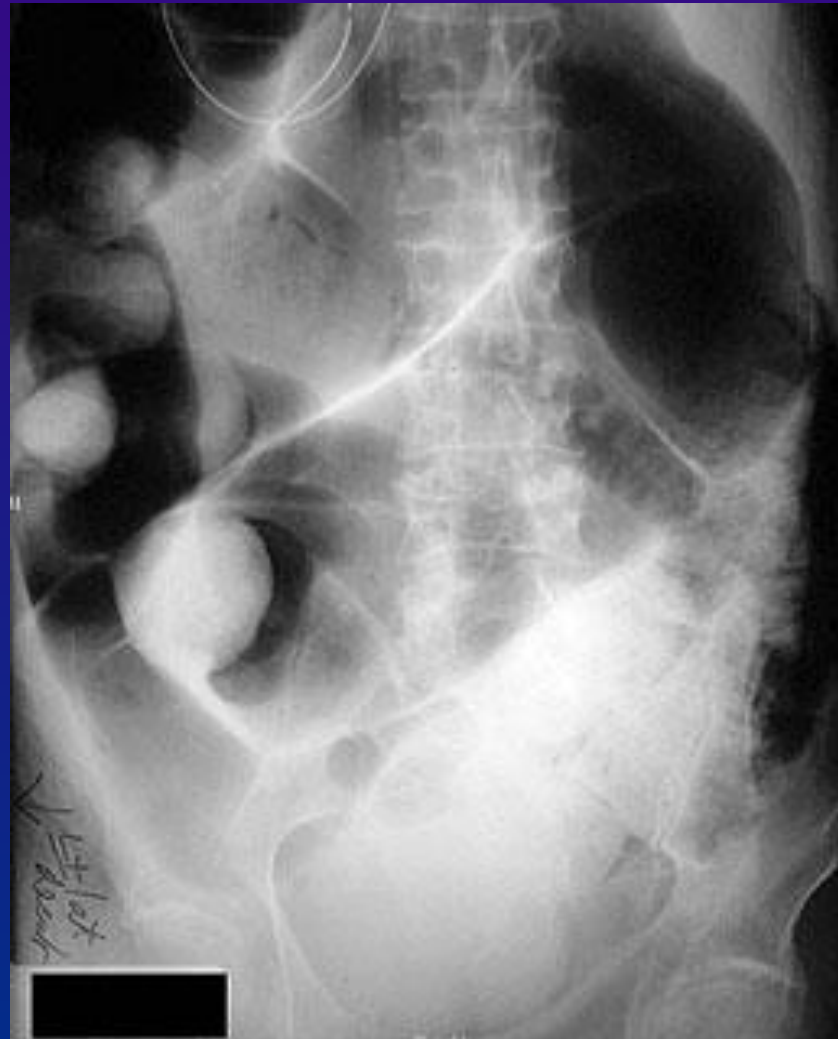
2. Abdominal X-RAY

- » Small bowel considered dilated - diameter >3 cm, proximal colon >9 cm, the sigmoid >5 cm.
- » Dilated small bowel - in the central portion of abdomen (plicae circularis).
- » Dilated colon - in the periphery of abdomen (haustral marking).
- » Diagnostic in 50-80% of patients
- » The cause of bowel obstruction can often determined
 - Presence of pneumobilia - G.S ileus.
 - Sigmoid and cecal volvulus - pathognomnic images.

Small Bowel Obstruction



Large Bowel Obstruction



X ray



Diagnosis

❑ **Contrast studies:**

- ✓ Indications are controversial.
- ✓ Identify site and often the cause of obstruction.
- ✓ Differentiate between colonic and distal small bowel obstruction
- ✓ Differentiate between ileus-partial and complete obstruction.

❑ **Computed tomography:**

- ✓ Valuable in B.O especially when plain films failed in diagnosis or suspect strangulation.
- ✓ Sensitivity **93%** and specificity **100%**
- ✓ **Accuracy 94%** in diagnosis of BO

❑ **US**

CT



US

- You can find distended loops of intestine that are filled with fluid.
- The wall of the intestine may be oedematous.
- Possibility of viewing the image in real time, you can observe the increased intestinal peristalsis.
- In intussusception the sensitivity of ultrasound is 95%-100%.



Treatment

A. Resuscitation.

B. Conservative treatment

1. Previous surgery.
2. Incomplete obstruction.
3. Advanced malignancy.
4. Uncertain diagnosis.

C. Indications for surgery

1. Generalized or localized peritonitis.
2. Perforation.
3. Irreducible hernia.
4. Palpable mass.
5. Virgin abdomen.
6. Closed loop
7. Failure to improve.

Small Bowel Obstruction

Treatment

- Correct intravascular volume deficit
- NGT vs. Miller-Abbott or Cantor Tubes
- Serial Exams
- Operation if no improvement or if signs of complete (closed loop) obstruction or incarceration.
- Evaluation of Bowel Viability

Large Bowel Obstruction

Treatment

- Iv Fluids
- Naso Gastric Tube
- Operation

Emergently if signs of peritonitis / perforation

Prep bowel if possible

- Is an ostomy necessary?

Right vs. Left-sided Lesions

Traditional vs. Newer Attitudes

INDICATIONS FOR SURGERY

- **Absolute**

Generalised peritonitis

Localised peritonitis

Visceral perforation

Irreducible hernia

- **Relative**

Palpable mass lesion

'Virgin' abdomen

Failure to improve

- **Trial of conservatism**

Incomplete obstruction

Previous surgery

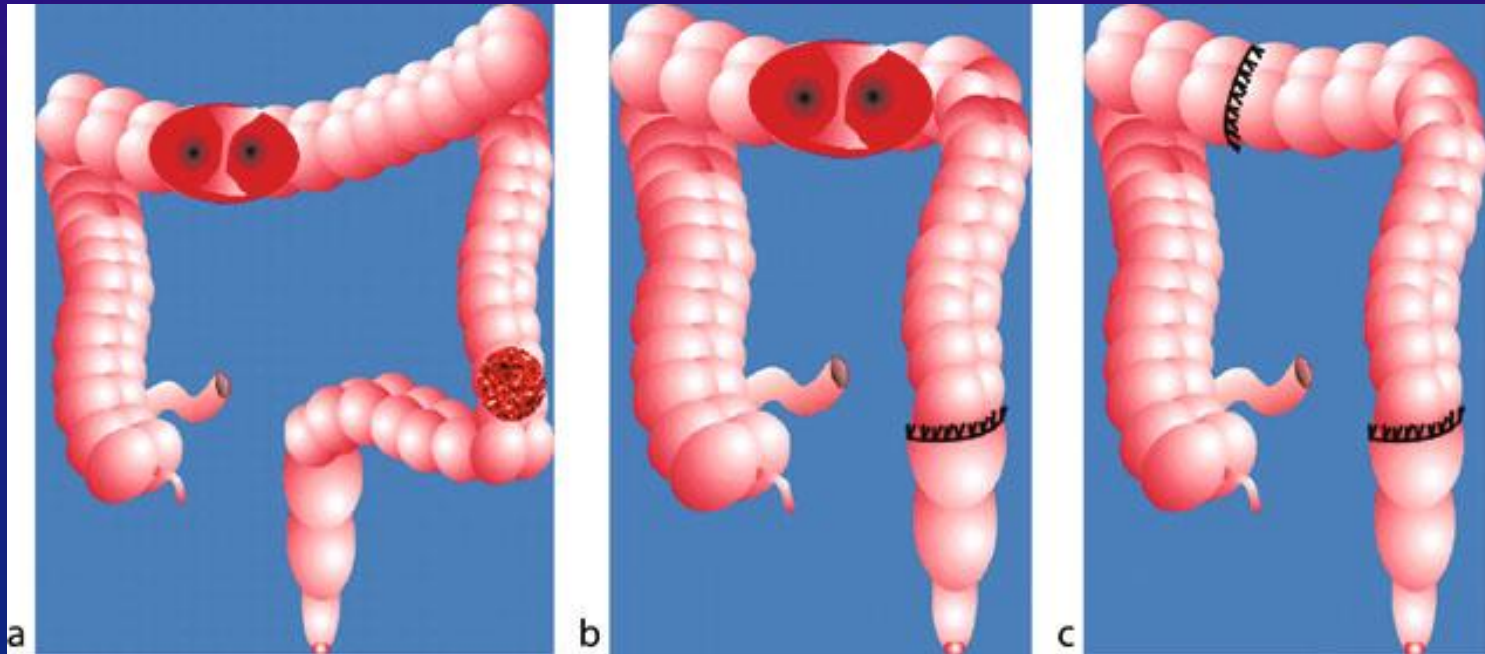
Advanced malignancy

Diagnostic doubt - possible ileus



Three-staged procedure

- Defunctioning colostomy
- Resection and anastomosis
- Closure of colostomy
- Three stage procedure will involve 3 operations!



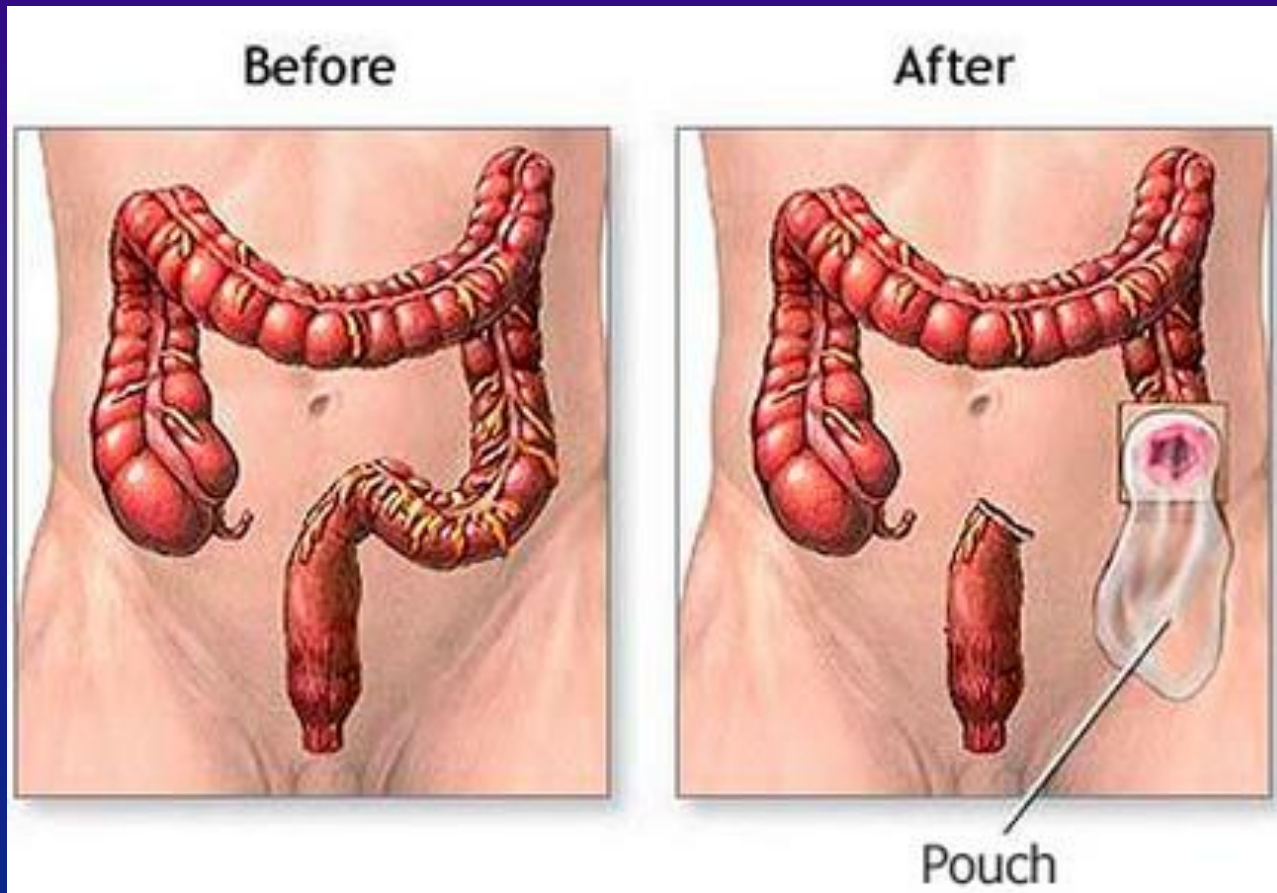
Two-staged procedure

- Hartmann's procedure
- Closure of colostomy
- With two-staged procedure only 60% of stomas are ever reversed

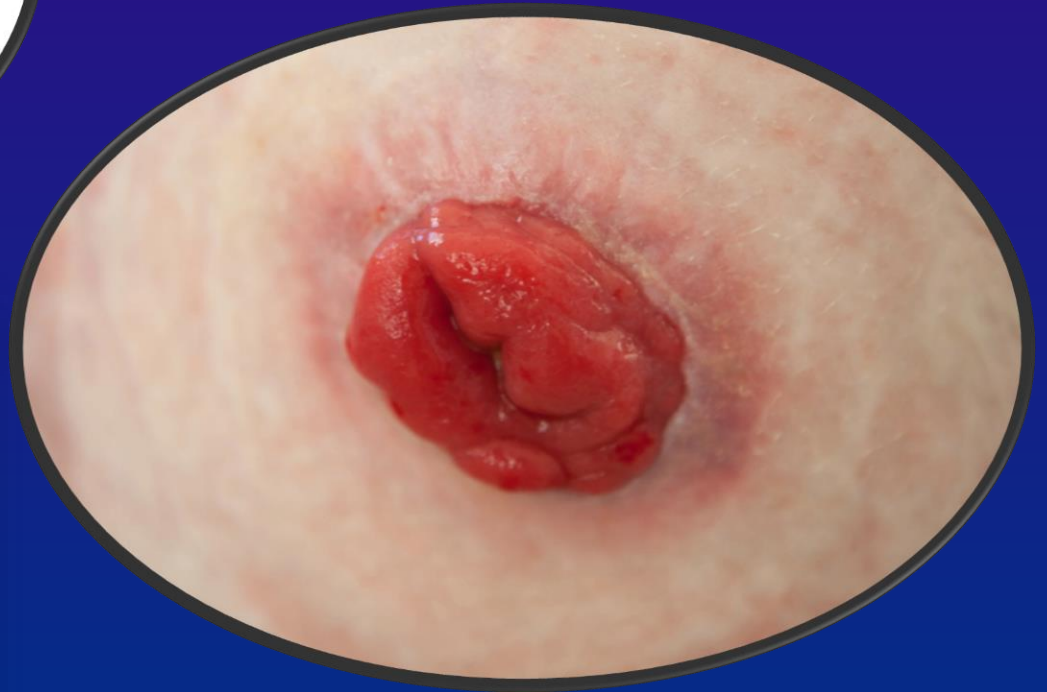
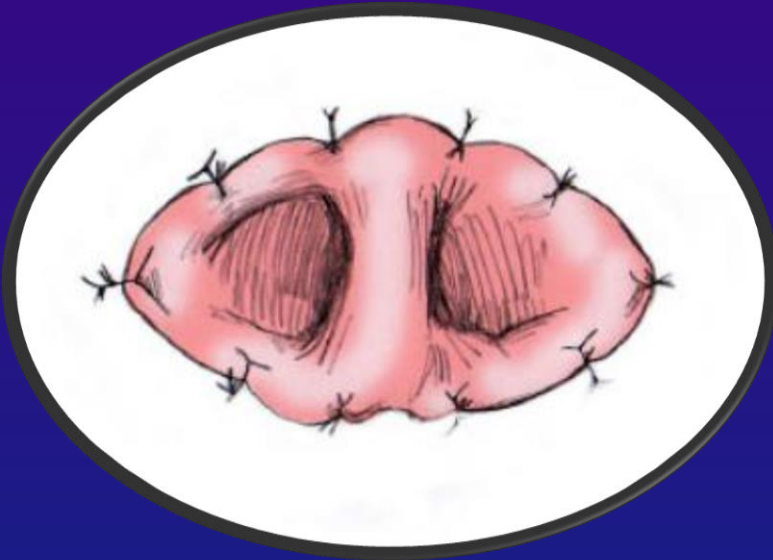
HARTMANN's PROCEDURE

the surgical resection of the rectosigmoid colon with closure of the rectal stump and formation of an end colostomy

Hartmann's procedure

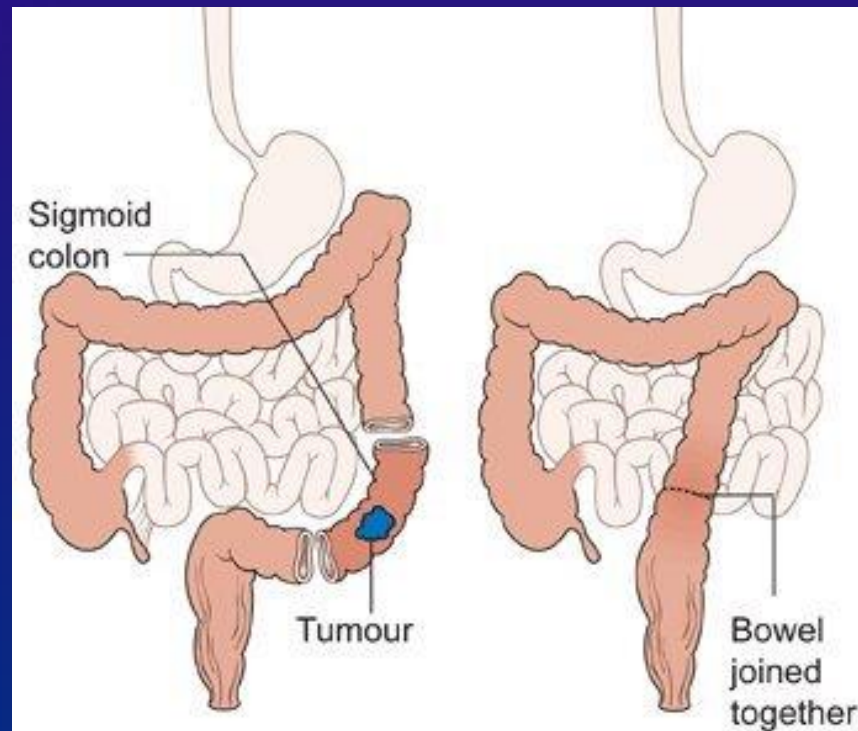


Ileostomy - Colostomy



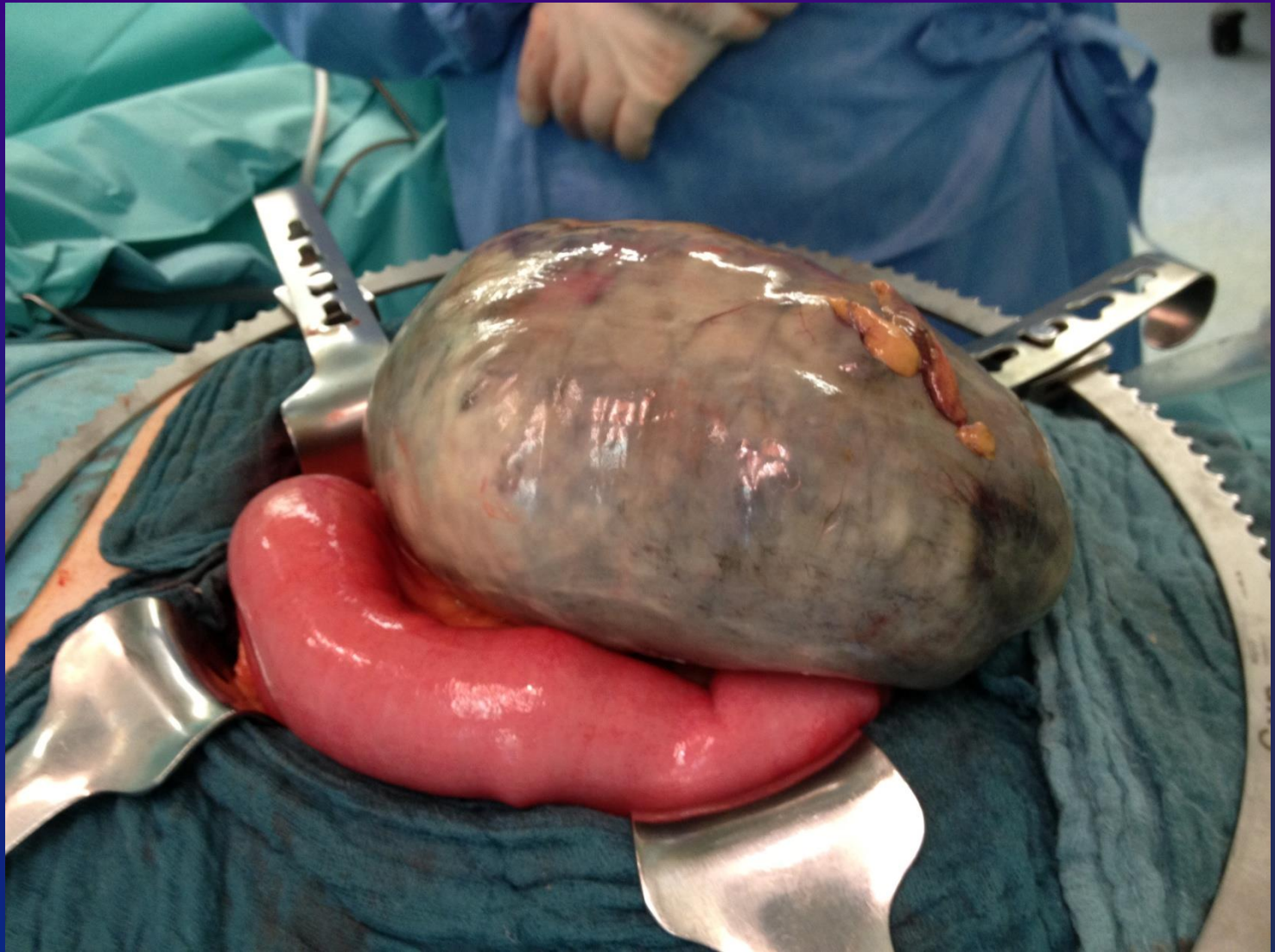
One-stage procedure

- Resection, on-table lavage and primary anastomosis
- Associated with prolonged total hospital stay
- One-stage procedure - stoma is avoided
- Anastomotic leak rate <4%

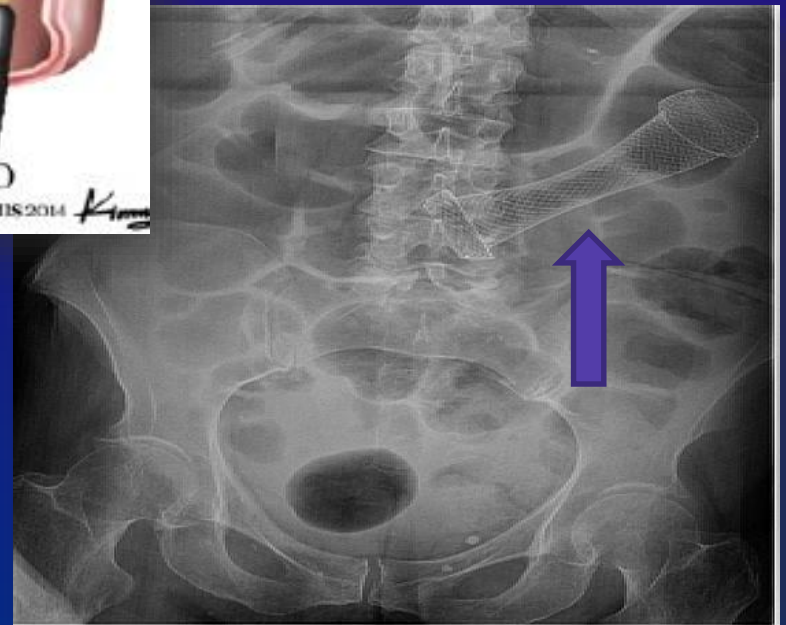
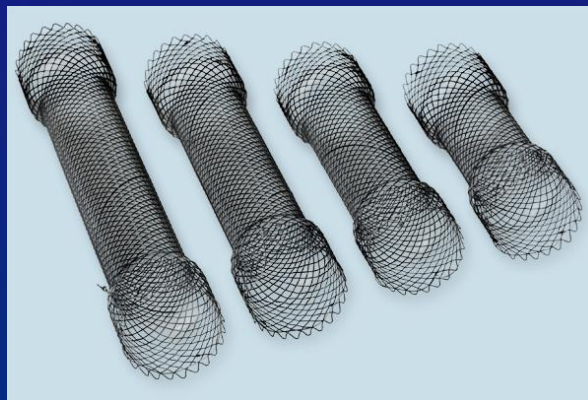
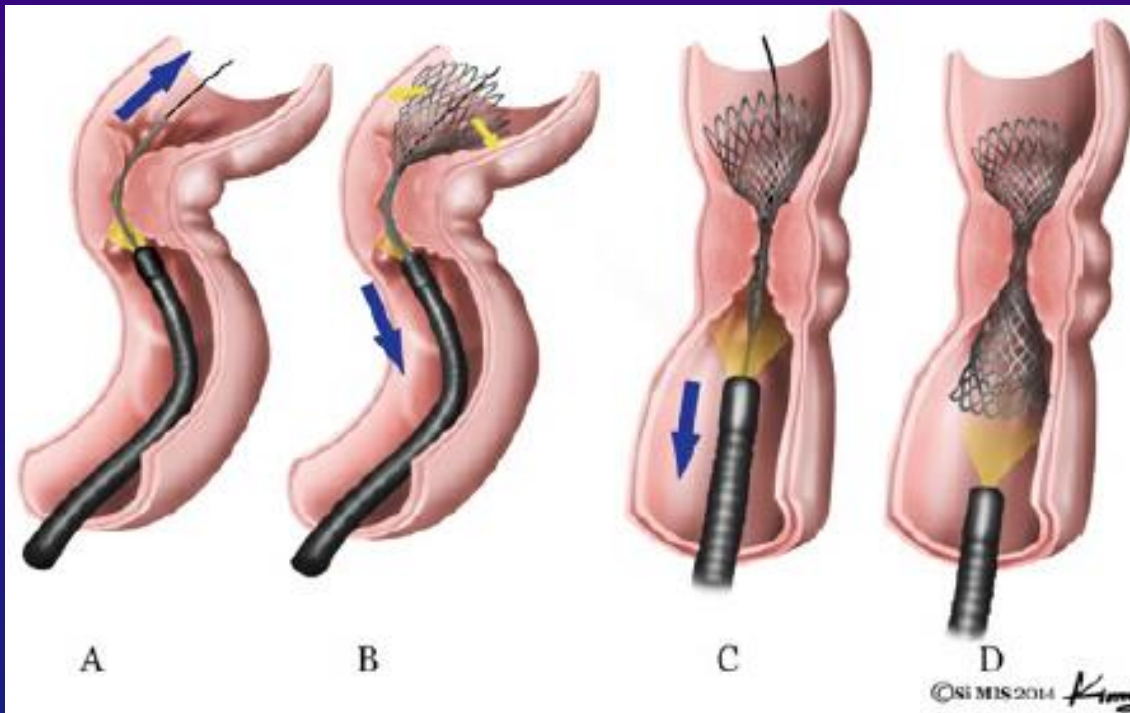








Minimally invasive procedure



Thank You