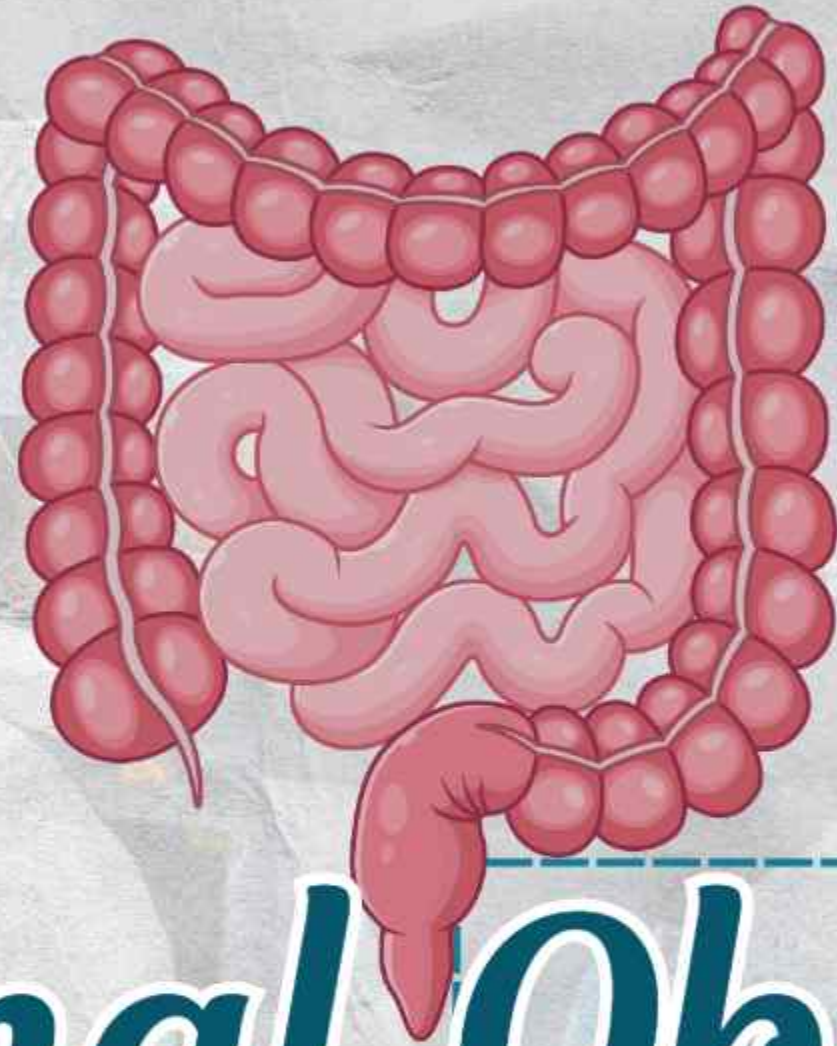




Intestinal Obstruction

*Done By: Haneen Mallah, Yaman Suliman, Rama Qafisheh,
layan khaled, Ameera almaliti*

Tobies

CLICK ON ICONS 



*Definition and classification
pathology*



Etiology



Clinical presentation



Investigations



Treatment



Definition classification *pathology*

Definition classification pathology

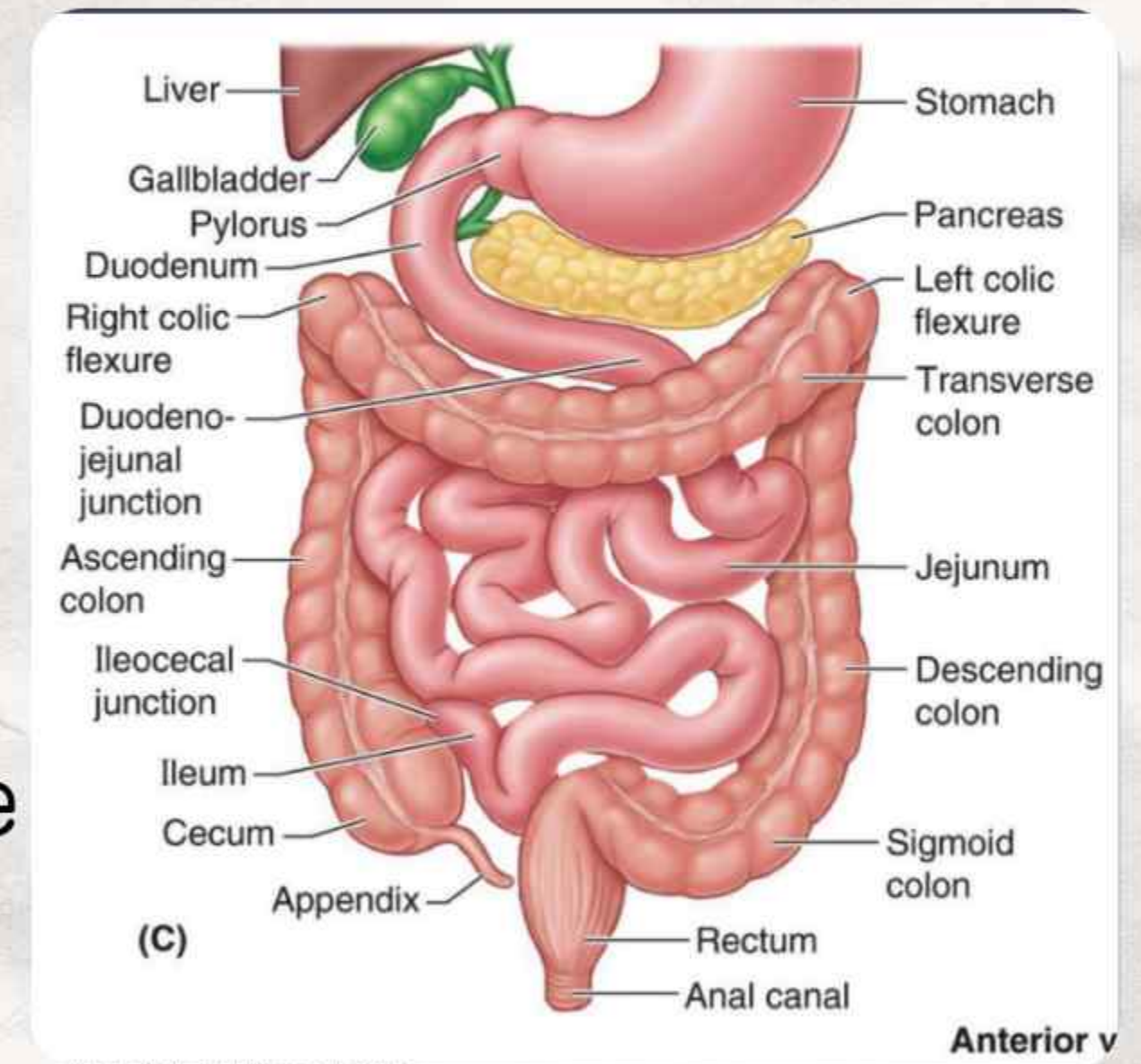
Quick Anatomy

INTESTINAL OBSTRUCTION :

- **Definition:** Failure and arrest of distal downwards propagation of the intestinal contents.

which part of the intestine?! any part of the intestine, but small intestine is more common to be obstructed.

the contents? Fluids, food, gas...



Definition classification pathology

CLASSIFICATION:

I. According to Intestinal movement:

Dynamic: mechanical

Adynamic: functional, paralysis. Example: paralytic ileus.

II. According to the level of obstruction:

1. High small intestinal obstruction: affect duodenum or jejunum.

2. Low small intestinal obstruction: affect ileum.

3. Large intestinal obstruction.

III. According to speed of onset :

1. Acute obstruction:

- It has rapid onset , symptoms are early and usually affect small intestine.

2. Chronic obstruction:

- It has gradual onset , symptoms are incidious and usually affect large intestine. There is progressive constipation, distension & abdominal colics.

3. Acute obstruction on top of chronic: A narrow lumen in chronic intestinal obstruction become completely obstructed by impaction of hard faeces.

Definition classification pathology

- **IV. Etiology:**

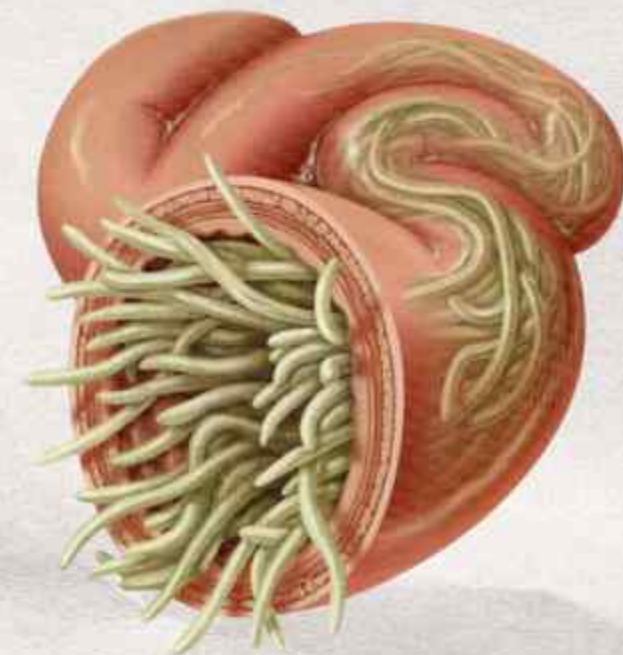
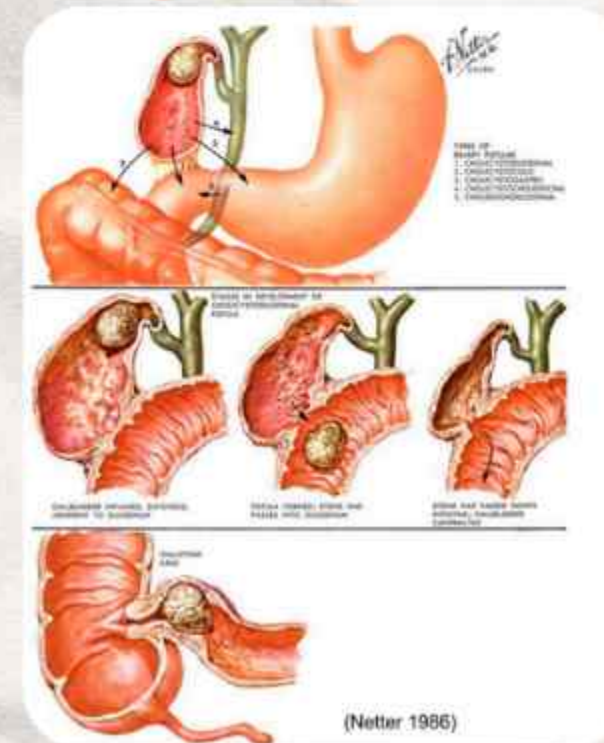
A. Adynamic obstruction: Paralysis of intestinal movements as in:

1. Paralytic ileus. 2. Acute mesenteric vascular occlusion.

B. Mechanical (Dynamic) obstruction: the intestinal movement intact but there is a mechanical factor which causes obstruction.

The obstructing factor may be:

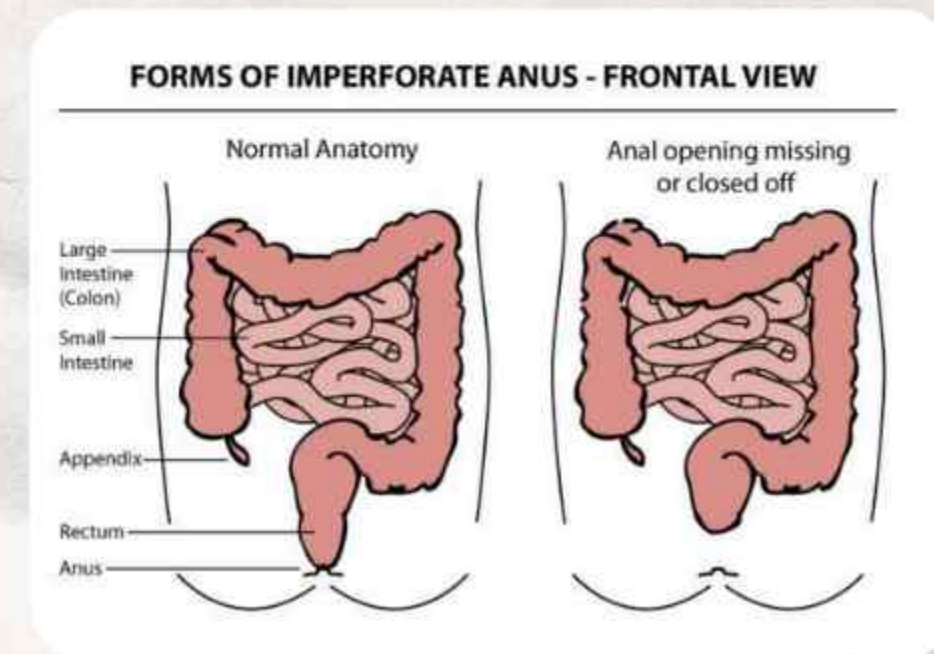
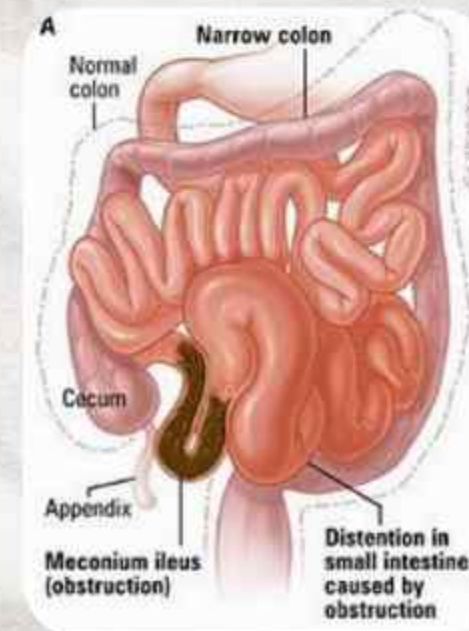
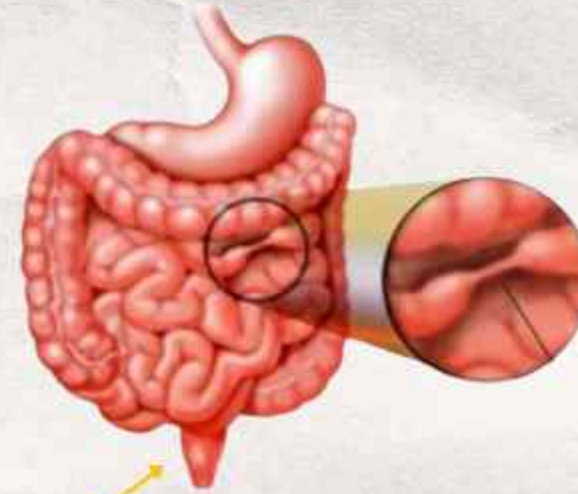
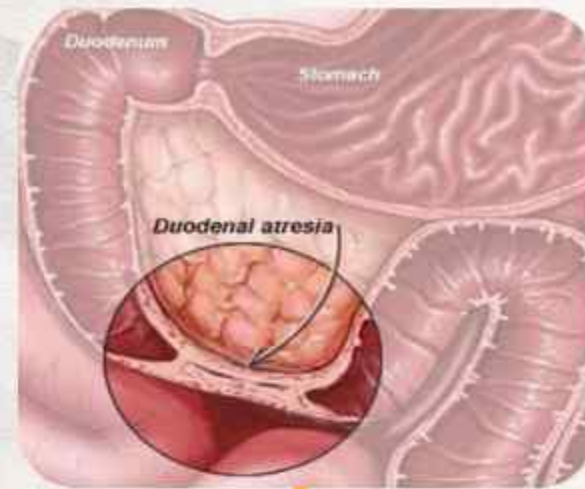
1. In the lumen: F.B., hard faeces, gall stone ileus & mass of parasites.



IV. Etiology: classification

2. In the wall:

- a. Congenital: Congenital atresia or stenosis of duodenum, jejunum or ileum , imperforate anus and meconium ileus.
- b. Stricture of intestine: postoperative, T.B., ulcerative colitis or Crohn's disease.
- c. Neoplasms: Colorectal carcinoma is the commonest cause of large intestinal obstruction .
- d. Volvulus and intussusception.

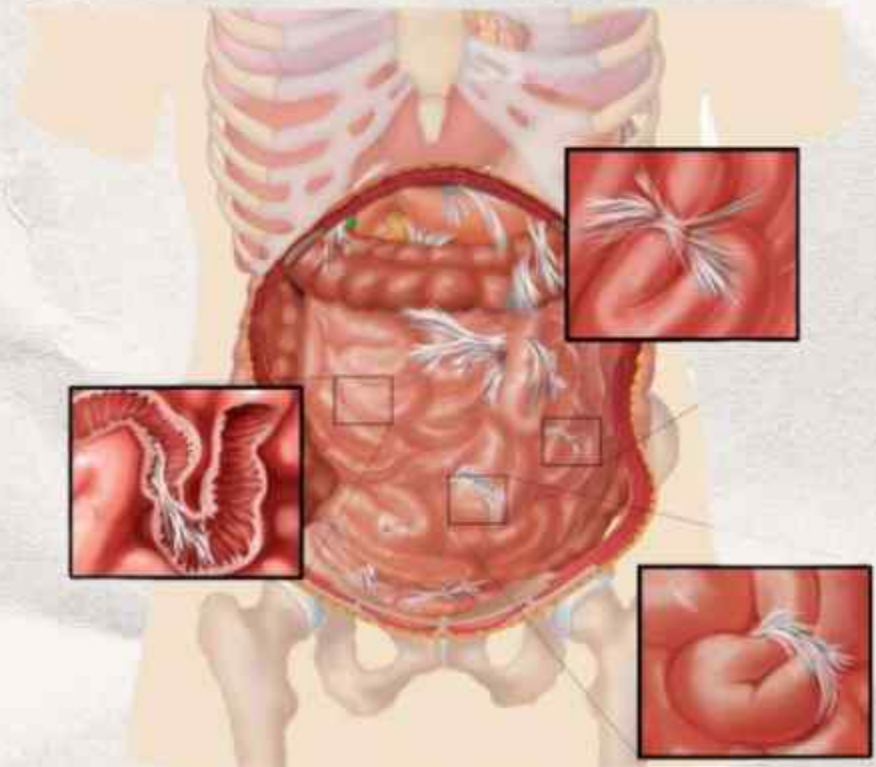


Definition classification pathology

IV. Etiology: classification

3. From outside:

- a.** Adhesive obstruction is the commonest cause for small intestinal obstruction in adults .
- b.** Obstructed and strangulated hernia is the commonest cause for small intestinal obstruction in children .
- c.** Compression or infiltration of intestine by any abdominal neoplasms.



Definition classification pathology

PATHOLOGY : 3 PATHOLOGICAL TYPES

1. Simple occlusion: *without impairment of blood supply*

- The intestine distal to the obstruction show normal peristalsis and absorption > empty intestine become immobile and contracted > absolute constipation.
- The intestine proximal to the obstruction :

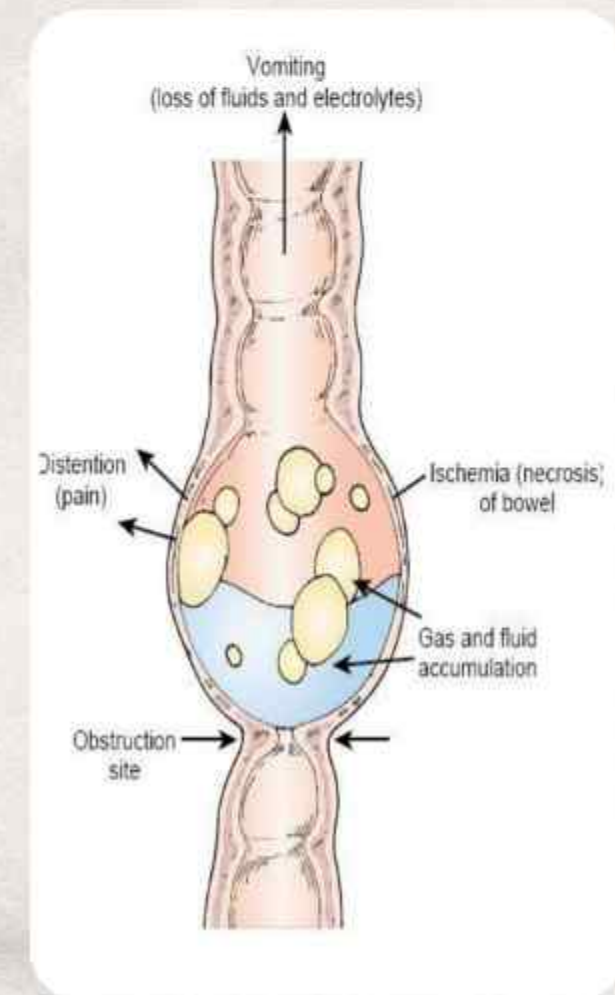
Hyperperistalsis to overcome the obstruction > colics

Powerful antiperistalsis > vomiting.

- If the obstruction persists > the gut becomes flaccid > stasis of the contents > infection > severe distension with:

Gases : swallowed air (70%) , diffusion from congested vessels in the intestinal wall (20%) & bacterial fermentation (10%) .

Fluids : GIT secretion (8 liters) and diffusion from congested vessels in the intestinal wall .

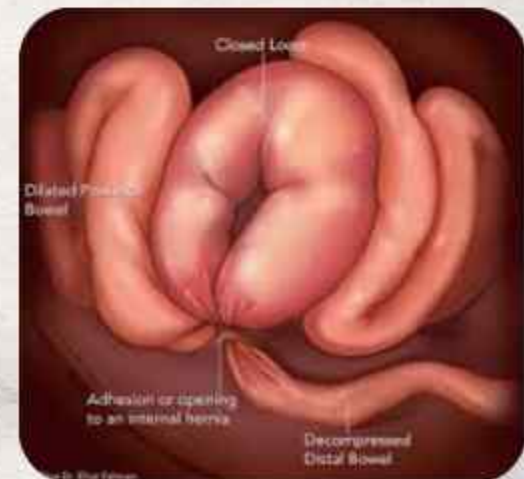


Definition classification pathology

2. Strangulation: *with impairment of blood supply*

- Due to high in the lumen of the gut > Pressure on the wall of the gut > occlusion of veins in the wall of the gut > transudation of massive fluid in the lumen > more pressure on the wall of the gut > occlusion of arteries in the wall of the gut > moist septic gangrene of the gut > perforation > peritonitis.
- Mucosa of gut is the first layer affected by ischaemia > acute ulceration & intra-luminal haemorrhage .
- E.g: strangulated hernia, volvulus, intussusception or when a loop of intestine is occluded by a band....

3. Neurogenic obstruction: The commonest form is paralytic ileus.





Etiology

Etiology

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)

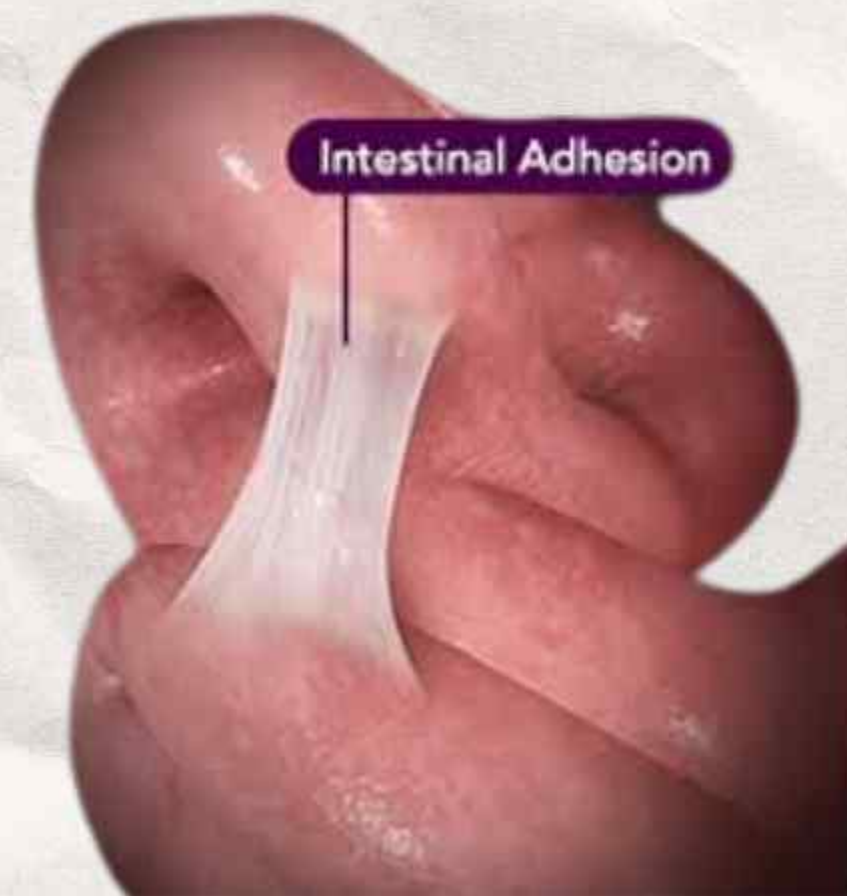
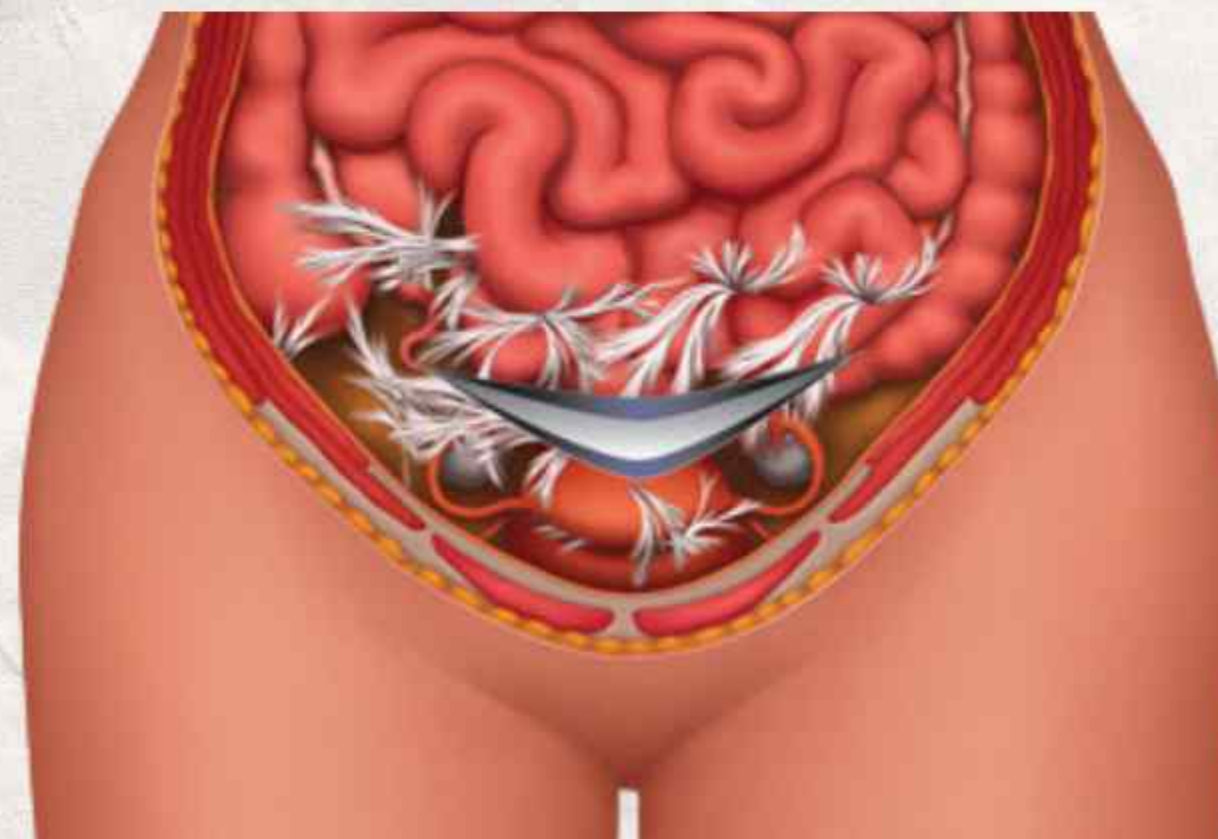
Mechanical Small bowel obstruction

Adhesions:

incidence : Adhesions the most common cause of SBO in adults

Causes : 1.injury such as prior surgical procedures (gynecological operation / appendectomy)
2.infection (i.e., peritonitis)
3.radiation damage.

- Adhesions start to form within hours of abdominal surgery any source of peritoneal irritation results in local fibrin production , which produces adhesions between apposed surfaces (Adhesions bind intestinal loops to each other or to the abdominal wall)

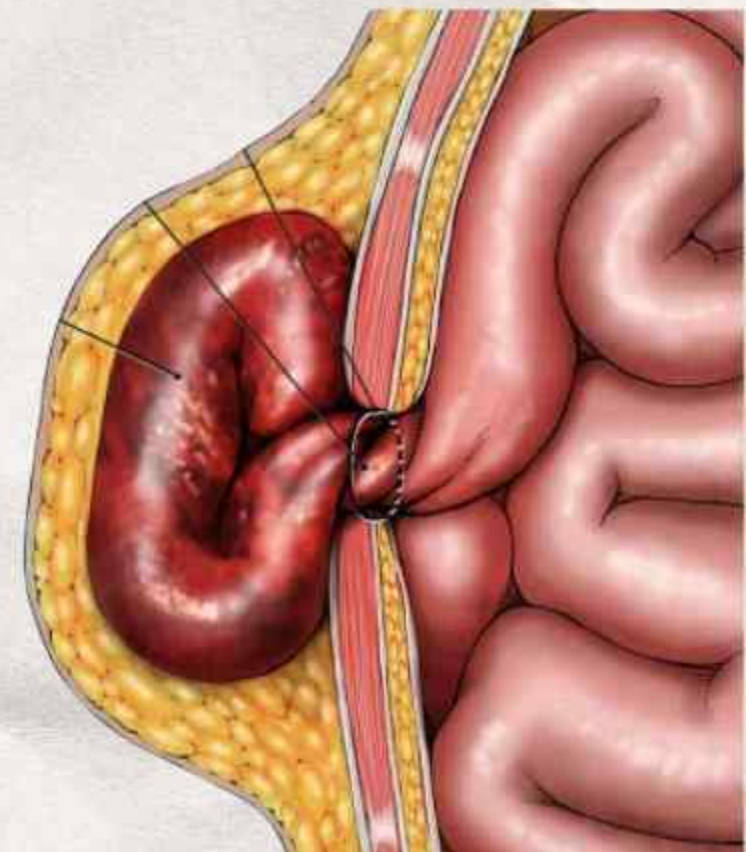


Mechanical Small bowel obstruction

Obstructed and strangulated hernia

is the commonest cause for SBO in children and the 2nd common cause in adults , occurs when intestinal loops protrude through any weakness or defect in the wall of the peritoneal cavity (Inguinal, femoral, umbilicus and sites of surgical scarring).

- **This might cause pressure at the neck of the herniated loops and result in venous drainage impairment.**
- **Over time, if pressure increases , this might lead to venous and arterial compromise and eventually infarction (strangulation).**



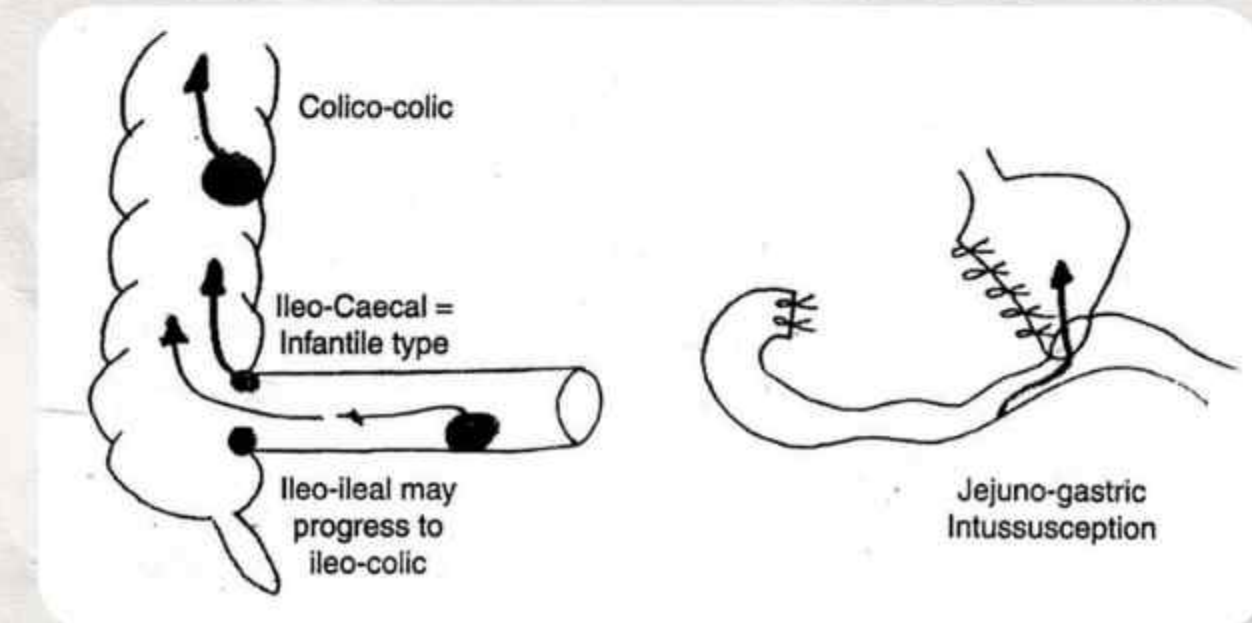
Mechanical Small bowel obstruction

Intussusception

* Definition: Invagination of a segment of the gut into the lumen of a distal segment of gut.

* Anatomical types:

1. Ileo-caecal intussusception: The commonest , terminal ileum is invaginated into the caecum with the ileo-caecal valve forming the apex of intussusceptions .
2. Ileo-ileal: The ileum is invaginated into the distal ileum.
3. Colo-colic: colon is invaginated into the distal colon.
4. Ileo-colic: ileo-ileal intussusception advancing till its apex enters the colon.
5. Retrograde: as jejuno-gastric intussusception after gastrojejunostomy.



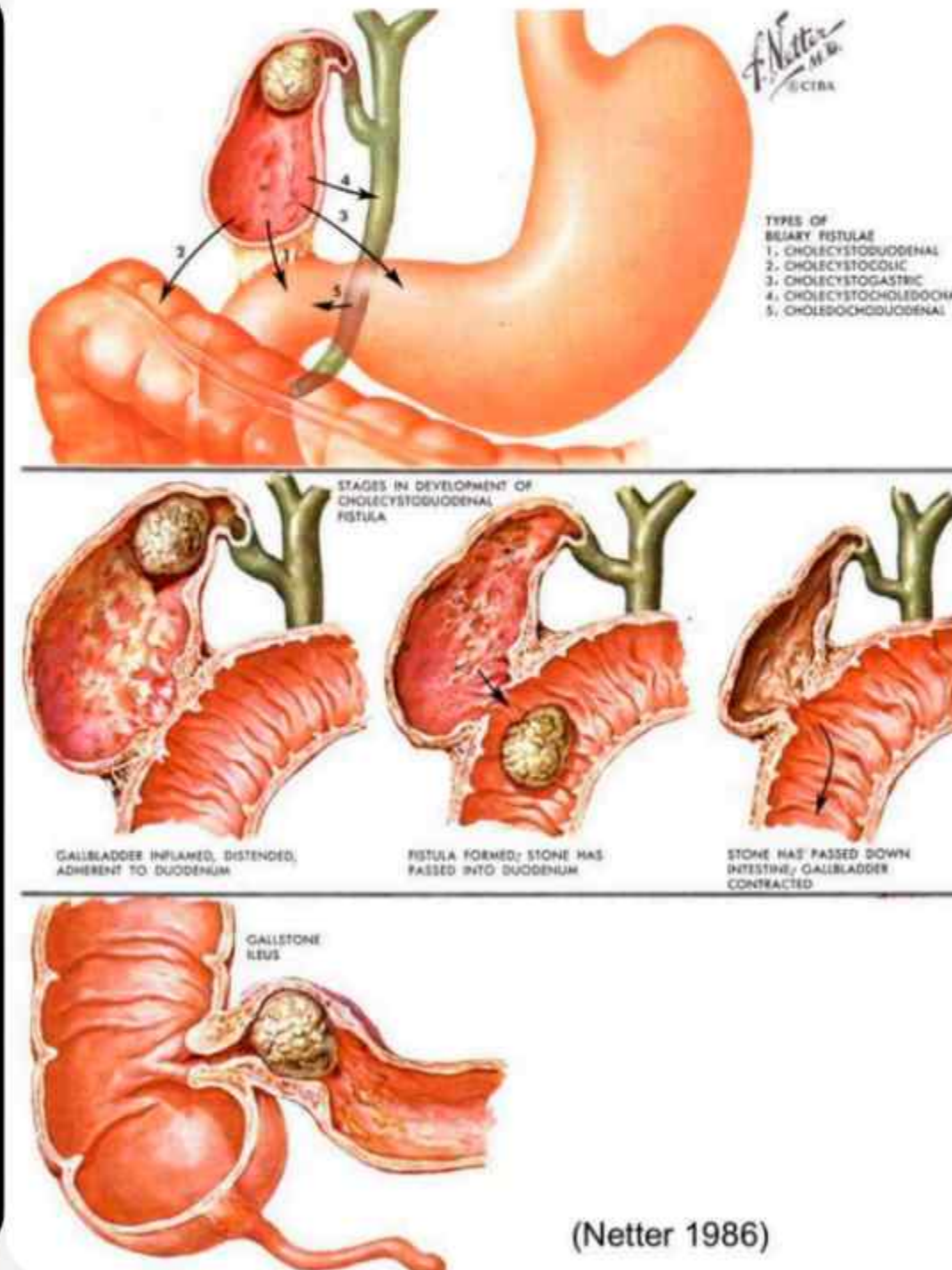
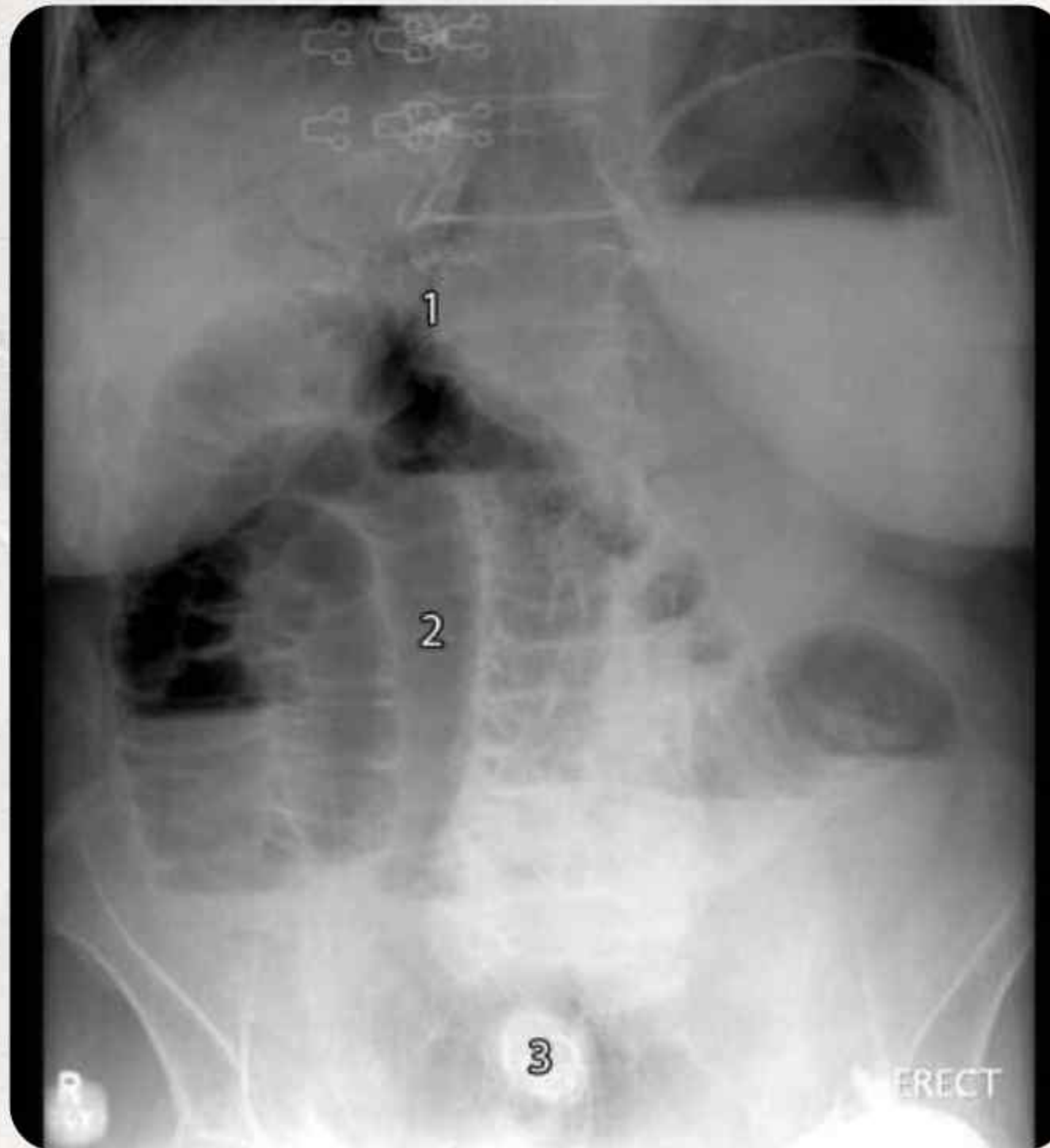
Mechanical Small bowel obstruction

Bolus obstruction gallstones

- Gallstone ileus secondary to erosion of a large gallstone directly through the gallbladder into the duodenum.
- Classically, there is impaction about 60 cm proximal to the ileocecal valve.
- The characteristic radiological sign of gallstone ileus is Rigler's triad,
comprising:
small bowel obstruction,
pneumobilia (air in the biliary tree - air in the bowel >to fistula> to biliary tree)
ectopic gallstone
- Elderly patient mostly.
- Treatment is surgery.

Mechanical Small bowel obstruction

Bolus obstruction gallstones



LARGE BOWEL OBSTRUCTIONS

Colorectal cancer

- The most common cause of large bowel obstruction is an underlying colorectal malignancy.
- Approximately 40% of colorectal cancer presents as emergencies and large bowel obstruction is the most common presentation.
- 90% of cases are diagnosed in individuals 50 years of age and older .

LARGE BOWEL OBSTRUCTIONS

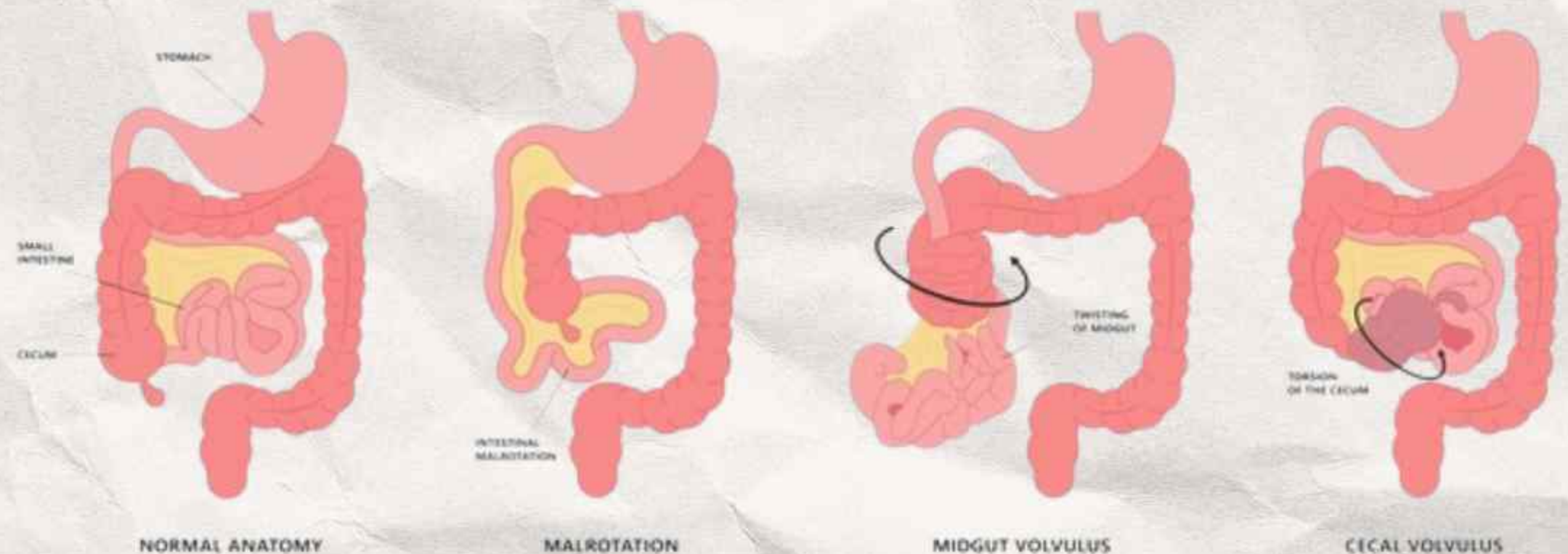
Volvulus

twisting of a loop of bowel around its mesenteric axis which results in obstruction of loop and occlusion of the main vessels at the base of the involved mesentery.

Types :

- 1-Volvulus of sigmoid colon (the commonest)
- 2-Volvulus of caecum
- 3-Volvulus of small intestine
- 4-Volvulus of neonatorum
- 5-Volvulus of stomach

INTESTINAL MALROTATION AND VOLVULUS



LARGE BOWEL OBSTRUCTIONS



Sigmoid Volvulus:

This occurs usually in elderly above 50 years and it is four times more common in men than in women.

The most important predisposing factors chronic constipation , too long sigmoid colon , narrow attachment of sigmoid mesocolon and adhesion between the apex of sigmoid and anterior abdominal wall

Occurs when the upper loop usually falls in front of the lower so that the twist is almost always anti clockwise direction >> closed loop obstruction which leading to :

distension of colon and sigmoid with gas which gives coffee bean like appearance with its base point to left iliac fossa and rectum below collapsed.

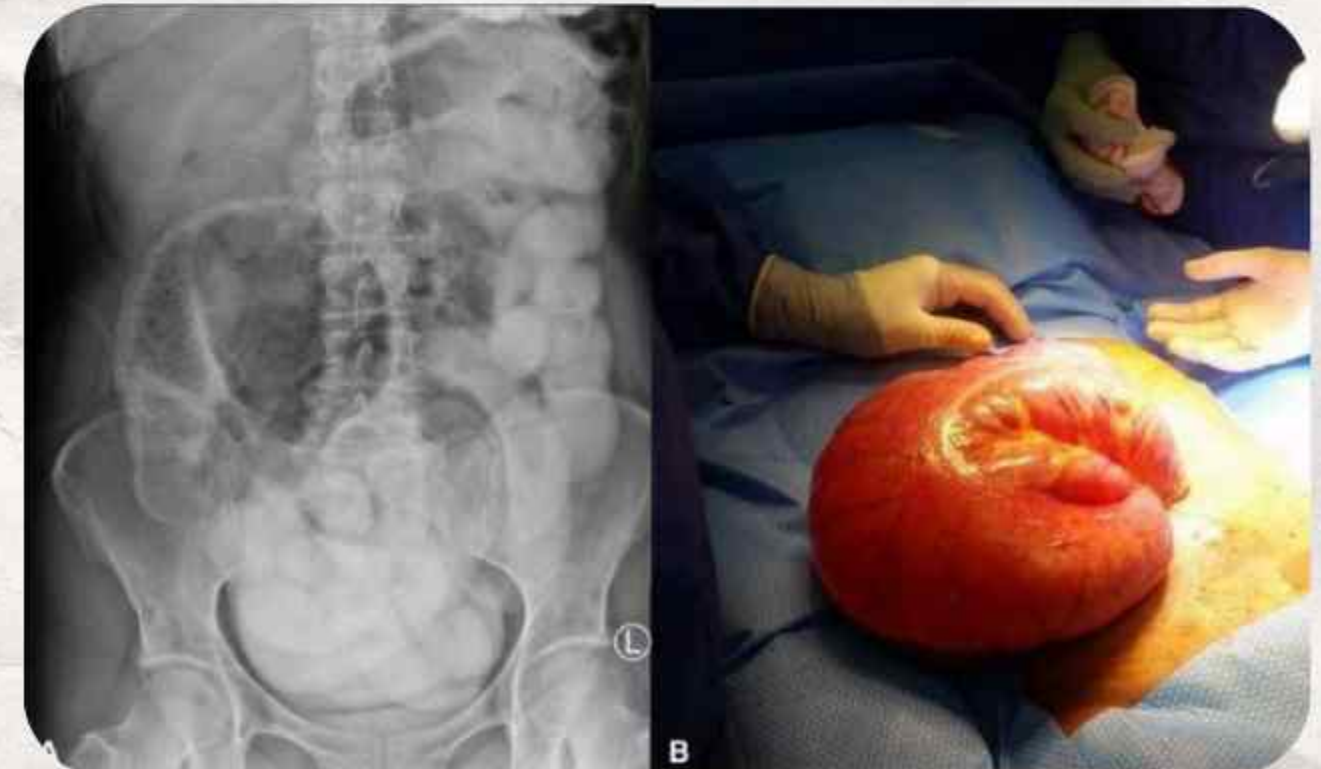
The pressure inside the closed loop rises rapidly with sever pressure on the wall leads to strangulation and perforation follows with rapid peritonitis.

The risk increases with chronic constipation , too long sigmoid colon , narrow attachment of sigmoid mesocolon and adhesions between the apex of sigmoid colon and anterior abdominal wall .

LARGE BOWEL OBSTRUCTIONS

Caecal volvulus:

- Occurs in younger population.
- it usually associated with congenital malformations, the caecum and proximal ascending colon rotate beyond the right iliac fossa during development so that , instead of being fixed to right iliac fossa, it has persistent mesentery.
- The dilation in caecum gives “stack of coins” appearance.

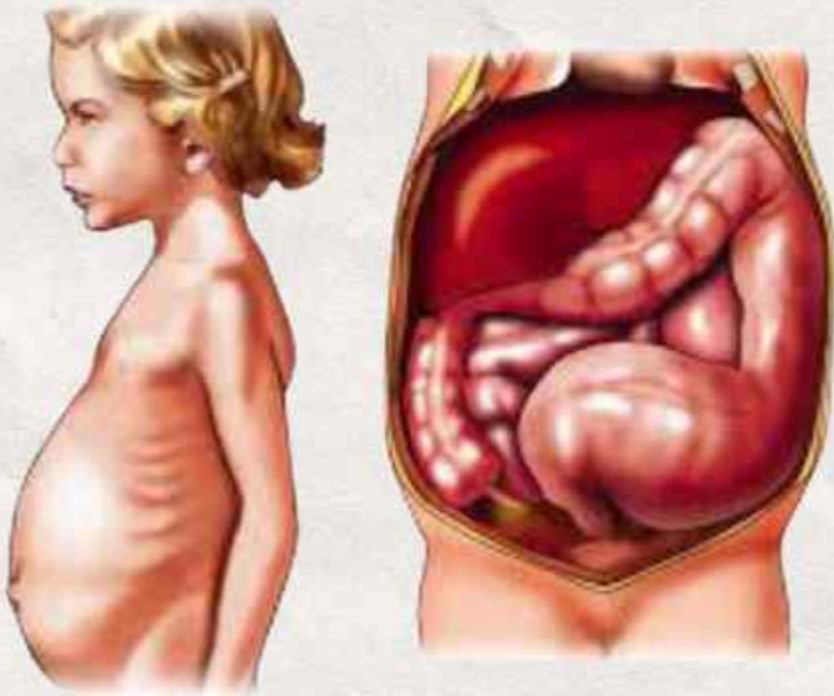


ADYNAMIC OBSTRUCTION

paralysis of intestinal movements.

1. Paralytic ileus:

loss of intestinal peristalsis & tone due to failure of neuromuscular transmission in the intestine.



2. Pseudo-obstruction

mainly affects the large bowel (cecum & ascending colon).

- Acute dilatation of colon without any mechanical obstruction.



3. Acute mesenteric vascular occlusion

Interruption of mesenteric supply to the intestines.

- The two major causes are:
Mesenteric arterial embolism
Mesenteric arterial thrombosis





CLINICAL PRESENTATION

CLINICAL PRESENTATION

Diagnosis of acute intestinal obstruction (C/P & investigation) :

A. Symptoms:

1. ABDOMINAL PAIN: (EARLIEST PRESENTATION)

- Present in all cases except paralytic ileus.
- Pain is colicky (hyperperistalsis) and intermittent (due to the fatigue) .



2. VOMITING:

- It is persistent and projectile (except paralytic ileus).
- Early in high small intestinal obstruction and late or absent in large intestinal obstruction .
- First clear, then bile stained and finally black offensive (faeculent, not fecal vomiting). True vomiting of faeces only occurs in patients with gastrocolic fistula



3. ABSOLUTE CONSTIPATION:

- There is failure to pass faeces & flatus.
- It is early symptom in large intestinal obstruction and late in high small intestinal obstruction .



4. ABDOMINAL DISTENSION:

occurs in advanced cases particularly marked in chronic large bowel also in volvulus of the sigmoid colon



CLINICAL PRESENTATION

It is important to note that not all of these four features need necessarily be present in a case of intestinal

obstruction. The sequence of onset of symptoms will help localize the obstruction to the upper or lower intestine

	Small intestine	Large intestine
1) pain	periumbilical	more suprapubic
2) Vomiting	early	late
3) distension	Minimal to moderate (central)	Marked(peripheral)
4) Absolute constipation	late	early

	simple occlusion	Strangulation	Paralytic ileus
1) Pain	Colicky, intermittent	Sever, persistent	No Pain
2) Palpation	-ve	Tenderness, rebound tenderness & rigidity	-ve
3) Auscultation	Loud exaggerated intestinal sounds	First exaggerated sound then disappears	Dead silent abdomen
4) suction	Relieves pain	No effect on pain	Relieve distension

CLINICAL PRESENTATION

History :

- cardinal symptoms(Colicky abdominal pain, constipation & Vomiting)
- ask about previous abdominal surgery, previous colonoscopy or irradiation.
- ask about previous attacks of bowel obstruction , history of hernia .
- ask about blood per rectum, weight loss, family history of colon cancer.
- the site of the pain and the distension, The timing of symptoms developm

BORBORYGMI

WHAT TRAINEES ARE TAUGHT



HIGH-PITCHED? Think SBO.

HYPERACTIVE? Think gastroenteritis, IBD, laxative use, or GI bleeding.

ABSENT? Think bowel obstruction, ileus, or ischemia.

CLINICAL PRESENTATION

Physical Examination:

A. General examination:

The pts looks in pain and may be rolling about with colic , with signs of dehydration (dry skin, sunken eyes, oliguria, poor venous filling).

The pulse is usually elevated, but the temperature is frequently normal.

A raised temperature and a tachycardia suggest strangulation.

B. Abdominal examination :

1. INSPECTION :

Look for :

- The abdomen distension or asymmetry -visible peristalsis may be present (visible peristalsis can be normal if the abdominal wall is very thin)
- Swelling, Scars or surgical incisions (ask the pts to cough to exclude incisional hernia)

CLINICAL PRESENTATION

2. PALPATION :

- Tenderness, rebound tenderness, rigidity & guarding over the affected loop.
- Abdominal mass (tumour or intussusception).
- Strangulated hernia (tense, tender with no impulse on cough).

3. PERCUSSION :

Abdomen normally tympanic but in intestinal obstruction, it's resonant anterior aspect but dull towards the flanks.

4. AUSCULTATION:

- 1) Loud exaggerated intestinal sounds in mechanical obstruction.
- 2) Dead silent abdomen in adynamic intestinal obstruction.

Digital rectal examination :

May show Obstructing mass in pouch of Douglas, apex of intussusception, fecal impaction.

- In all cases of suspected intestinal obstruction, the hernial orifices must be examined



investigation

investigation

The goal here is to confirm the diagnosis of intestinal obstruction and to know the cause, severity and the level and exact location of the obstruction.

labs :

1. **CBC**
2. **Serum electrolytes**
3. **coagulation test**
4. **Serum amylase**
5. **Urine analysis**

Laboratory findings consistent with the diagnosis of bowel obstruction:

Hyponatremia, hypokalemia, leukocytosis, metabolic acidosis, alkalosis, elevated serum lactate

investigation

ABDOMINAL X- RAY

1- Erect position: shows multiple air-fluid levels



investigation



2- Supine position:

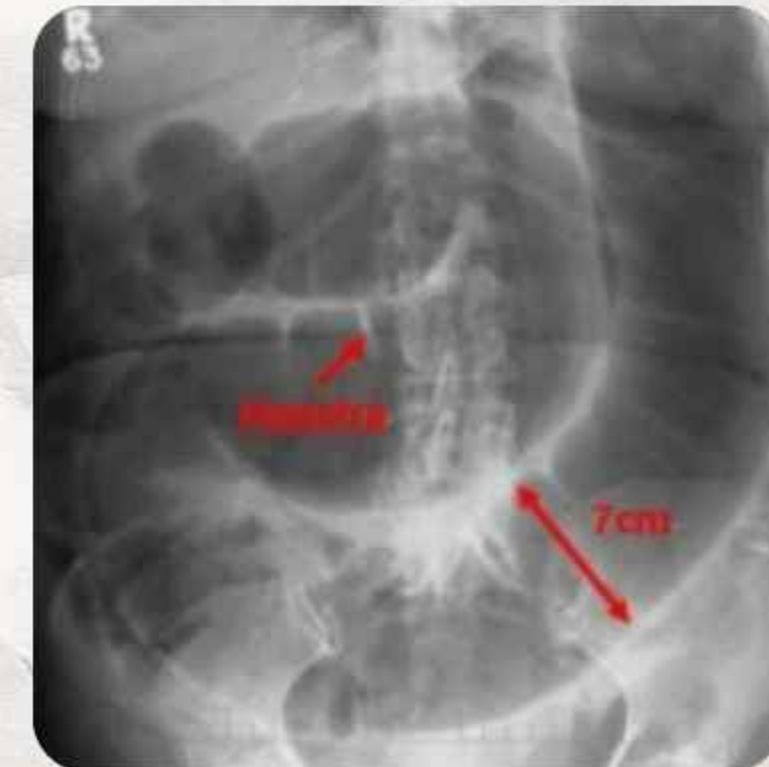
Jejunum: central and shows valvulae conniventes (concertina appearance)



Ileum: central and appears as structureless tubes



Large loops(colon): peripheral and shows haustral folds



investigation

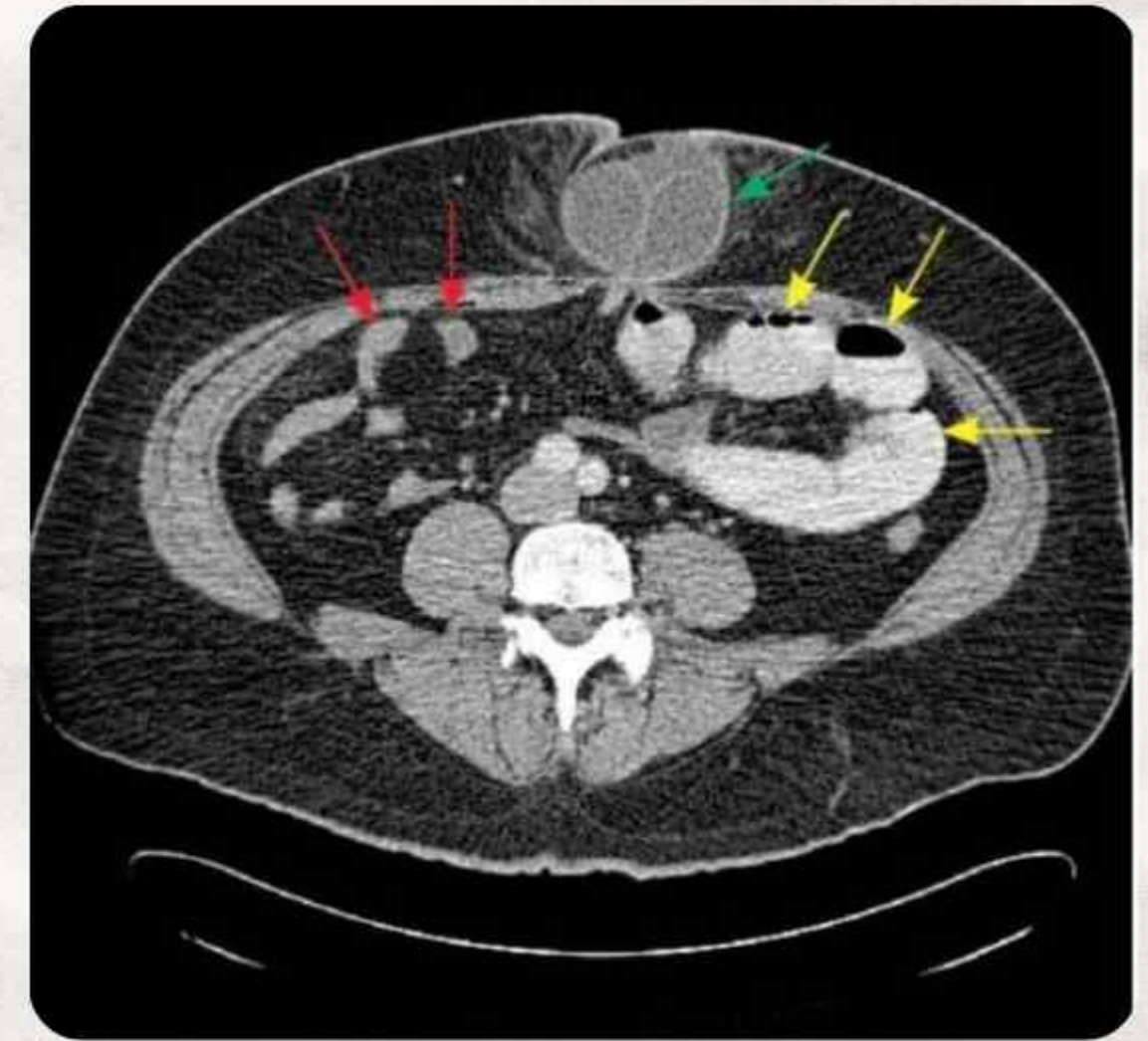
CT Scan:

Best imaging for bowel obstruction with contrast is 90% sensitive in the diagnosis

- The picture showing:

- dilated, contrast-filled loops of bowel on the patient's left (yellow arrows), with decompressed distal small bowel on the patient's right (red arrows).

- The cause of obstruction, an incarcerated umbilical hernia, can also be seen (green arrow), with proximally dilated bowel entering the hernia and decompressed bowel exiting the hernia.



investigation

**The picture showing:
small-bowel obstruction secondary to adhesions. CT scan
shows narrowing of involved loop of bowel (arrows).**

**Adhesion is inferred to be causing narrowing given history
of previous abdominal surgery. Multiple dilated loops of
small bowel are also seen.**



investigation

A barium enema is an X-ray exam that can detect any colonic obstruction.

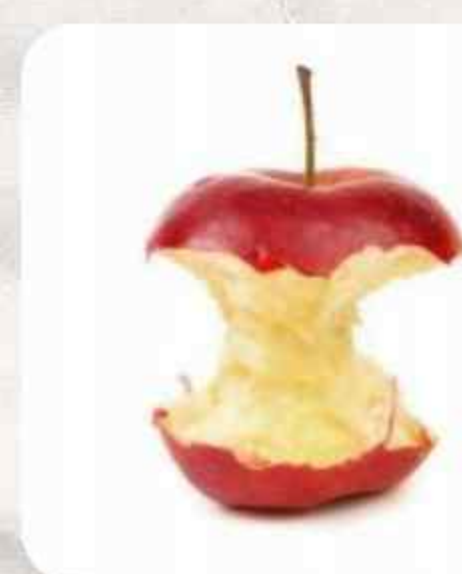
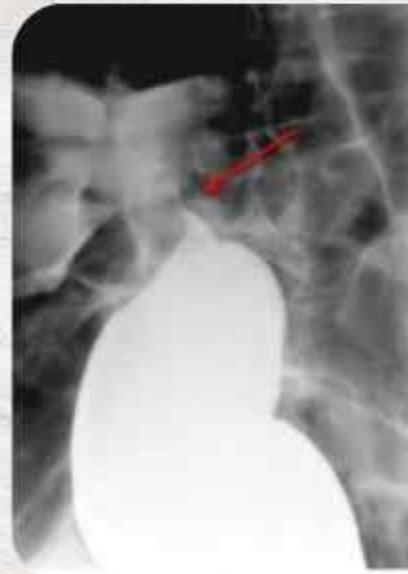
**The procedure is also called a colon X-ray.
An enema is the injection of a liquid into your rectum through a small tube.**



investigation

Findings:

- **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.**





Treatment

Treatment

Three General Principles In Treating Obstruction Are:

1. Preoperative Preparation.

2. Surgical Treatment.

3. Conservative Treatment.

Treatment

Preoperative Preparation

- The Patient Should Be Administered In Hospital And Get Rest.
- The Patient Should Be Prevented From Oral Feeding.
- The (Suck And Drip) Method, That Includes The Following;
 1. Gastric Aspiration / Nasogastric Suction
 - To Decompress The Bowels
(Reduces Pain, Reduces Strangulation, Reduces Postoperative Paralytic Ileus)
 - To Reduce The Risk Of Gastric Inhalation During The Induction Of Anesthesia.
 2. IV Fluids And Electrolytes Replacement To Replace All The Fluids That Have Been Lost In Vomiting.
 - Hartmann's Fluid (Contains NaCl, KCl) Or Normal Saline Are Given.
 - Plasma Expanders (Like Dextran) Are Given In Shock Patients.

Treatment

3. Blood Transfusion

In The Case Of Strangulation.

4. Antibiotics

In The Case Of Strangulation.

5. Apply Foley Catheter

To Check The Urine Output Every Hour And To Determine Whether The Volume Of Given Fluids Is Enough Or Not, Should Be (0.5 ml/kg/hour)

6. Observation

Always Check The Pulse, Blood Pressure, Temperature, Pain Site And Severity.

Treatment

SURGICAL TREATMENT

1. A Lower Right Paramedian Incision Is Made To Observe The Ileocecal Area.

If The Cecum Is Collapsed, Indication Of Small IO.

If The Cecum Is Enlarged, Indication Of Large IO.

2. Look At The Junction Between The Large And Collapsed Areas And Treat The

Underlying Cause (Repair Hernia Or Remove Adhesions Or Untwist The Volvulus).

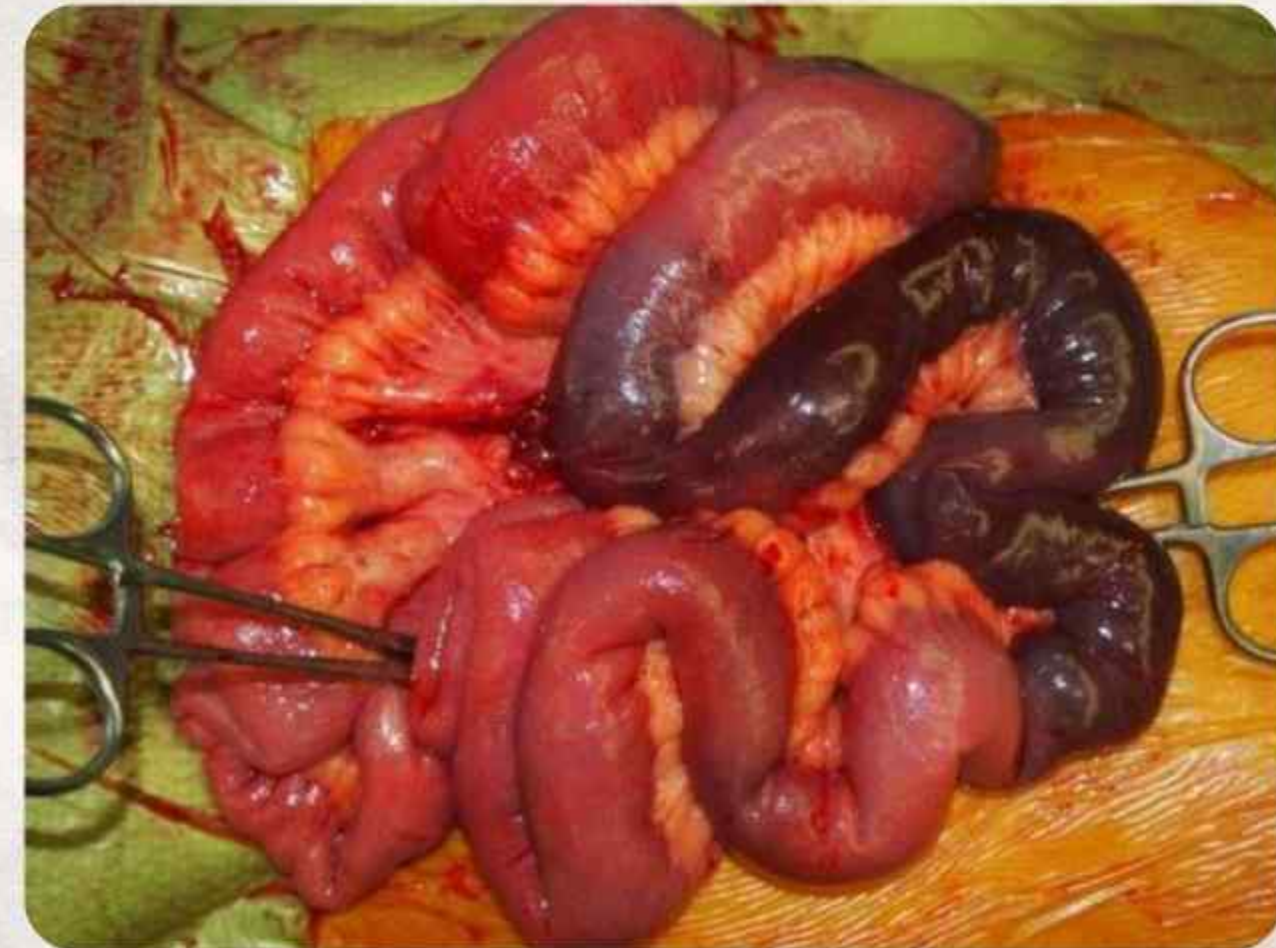
Treatment

SURGICAL TREATMENT

3. The Affected bowel Is Carefully Inspected For Its Viability.

-The 6 Signs Of A Non-Viable Tissue:

- 1. The Absence Of Intestinal Luster (Sheen)**
- 2. The Brownish-Green/ Blackish Color.**
- 3. The Absence Of Mesenteric Pulse.**
- 4. The Absence Of Intestinal Peristalsis.**
- 5. The Floppy Consistency Of The Wall.**
- 6. The Absence Of Bleeding If Injured.**



Treatment

Some Of The Surgical Options Depending On Viability:

1. Viable Tissue

Reduction To The Abdomen

2. Non-Viable Tissue

Small Intestines

Resection With Primary Anastomosis.

Right, Large Intestines

Resection With Ileocecal Anastomosis.

This Is Done Due To The Great Blood Supply And Low Bacterial Amounts.

Left, Large Intestines

1. Exteriorization Resection

2. Hartmann's Procedure

3. Proximal Colectomy With Mucous Fistula

This Is Done Due To The Low Blood Supply And High Bacterial Amounts.

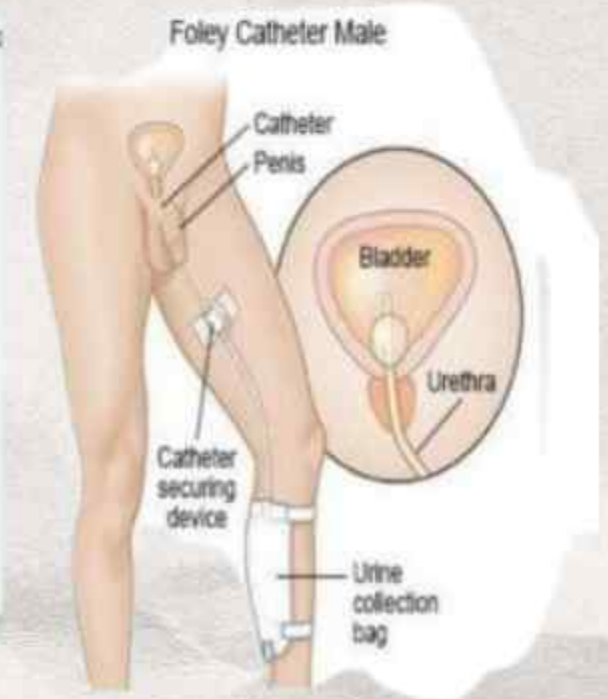
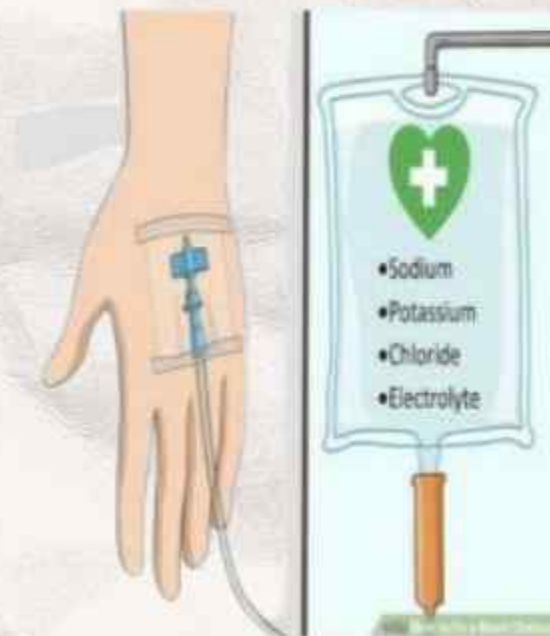
Treatment

3. Doubtful Tissue

Apply Hot Saline Packs Over The Intestines (3 X 15 Minutes) And Put The Patient In A Positive O2 Ventilator Machine.

This Helps In Vasodilation, Thus Moving The Circulation, And After This We Have To Observe And Look For Viability Signs.

4. Drainage



Treatment

Conservative Treatment

It's Used When:

1. Early Management.
2. No Signs Of Strangulation (No Complications).
3. Distinction From Postoperative Paralytic Ileus Is Uncertain.
4. Obstruction Due To Repeated Episodes Of Adhesions.

Treatment

Examples:

1. Ileocecal Intussusception

The High Hydrostatic Pressure Of The Barium Will Reduce The Intussusception And Is Monitored

Radiologically Until Appendix Is Seen.

2. Sigmoid Volvulus

A Rectal Tube Is Inserted Through A Sigmoidoscope Leading To Untwisting Of The Volvulus.

3. Adhesive Obstruction

It's Only Monitored By The Nasogastric Suction Tube (Ryle's Tube) And IV Fluid Dripping.

4. Fecal Impaction

Enema Is Inserted To Dissolve The Hard Fecal Mass

