

Intestinal obstruction

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Intestinal obstruction

- Dynamic vs Adynamic
- Small bowel vs large bowel
- Partial or Complete
- Simple vs complicated
- Closed loop or not
- Evidence of ischemia or perforation
- Acute or Chronic

CLASSIFICATION

Dynamic, in which peristalsis is working against a mechanical obstruction. It may occur in an acute or a chronic form.

Adynamic, in which there is no mechanical obstruction; peristalsis is absent or inadequate (e.g. paralytic ileus or pseudo-obstruction)

With onset of obstruction , gas and fluid accumulate proximal to the site of obstruction .

The intestinal activity increase to overcome the obstruction accounting for colicky pain .

More gas and fluid accumulation lead to further increase in intraluminal pressure.

Reduction in the intestinal motility .Translocation of gut bacteria

If the intraluminal pressure is still high and obstruction not relived this High pressure reduce the intestinal microvascular perfusion leading to ischemia and necrosis (strangulated bowel obstruction)

Dehydration and electrolyte loss are therefore

Reduced oral intake;

Defective intestinal absorption;

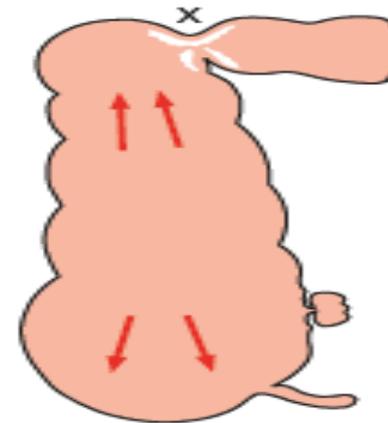
Losses as a result of vomiting;

Sequestration in the bowel lumen;

Transudation of fluid into the peritoneal cavity.

Closed-loop obstruction

- This occurs when the bowel is obstructed at both the proximal and distal points
- The distension is principally confined to the closed loop; distension proximal to the obstructed segment is not typically marked.
- classic form of closed-loop obstruction is seen in the presence of a malignant stricture of the colon with a competent ileocaecal valve
- Other example is volvulus



1.3 Carcinomatous stricture (X) of the hepatic flexure causing a closed-loop obstruction.

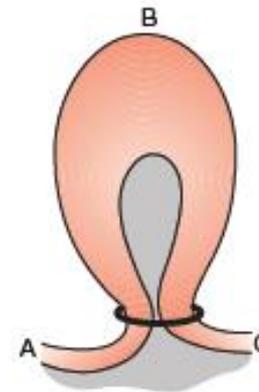


Figure 71.2 Distension. Closed-loop obstruction with no proximal (A) or distal (C) distension and impending strangulation (B).

SBO

Adhesion is most common cause

Summary box 71.1

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

Adhesions

Neoplasms

- Primary small bowel neoplasms
- Secondary small bowel cancer (e.g., melanoma-derived metastasis)
- Local invasion by intra-abdominal malignancy (e.g., Desmoid tumors)
- Carcinomatosis

Hernias

- External (e.g., inguinal and femoral)
- Internal (e.g., following Roux-en-Y gastric bypass surgery)

Crohn's disease

Volvulus

Intussusception

Radiation-induced stricture

Postischemic stricture

Foreign body

Gallstone ileus

Diverticulitis

Meckel's diverticulum

LBO

- The most common causes of large-bowel obstructions (LBO) are **colon carcinoma** and volvulus.
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- Approximately 60% of mechanical LBOs are caused by malignancies, 20% are caused by diverticular disease, and 5% are the result of colonic volvulus.
 - Stricture (diverticular or ischemic)
 - Intussusception, usually with an identifiable anatomic abnormality in adults but not in children
 - Impaction

SPECIAL TYPES OF MECHANICAL INTESTINAL OBSTRUCTION

- **Internal hernia**
- Internal herniation occurs when a portion of the small intestine becomes entrapped in one of the retroperitoneal fossae or in a congenital mesenteric defect.
- the foramen of Winslow
- a defect in the mesentery;
- Falciform ligament defect



Herniated small bowel through
defect in Falciform Ligament

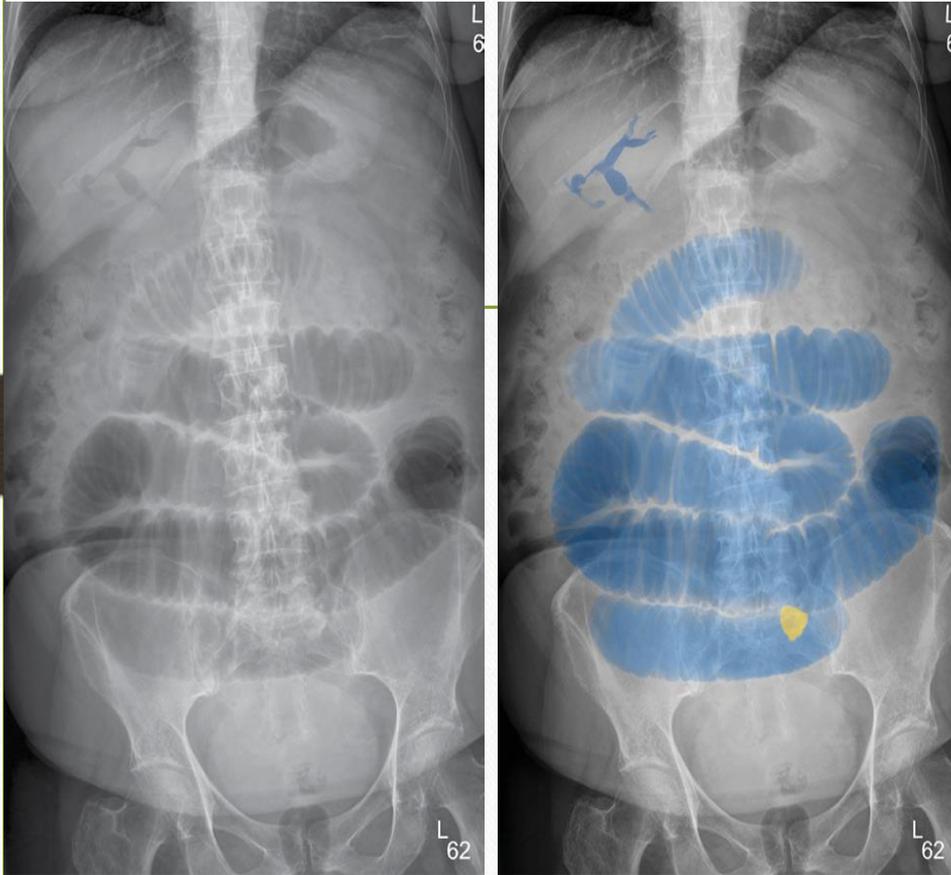
Obstruction from enteric strictures

- Small bowel strictures usually occur secondary to tuberculosis or Crohn's disease.
- Malignant strictures associated with lymphoma are uncommon, whereas carcinoma and sarcoma are rare.
- Presentation is usually subacute or chronic.
- Standard surgical management consists of resection and anastomosis

Bolus obstruction

Gallstones

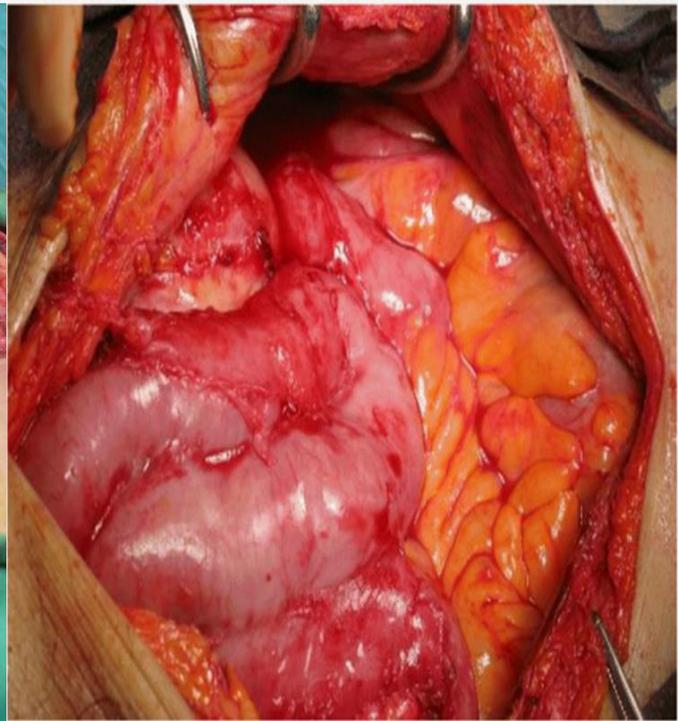
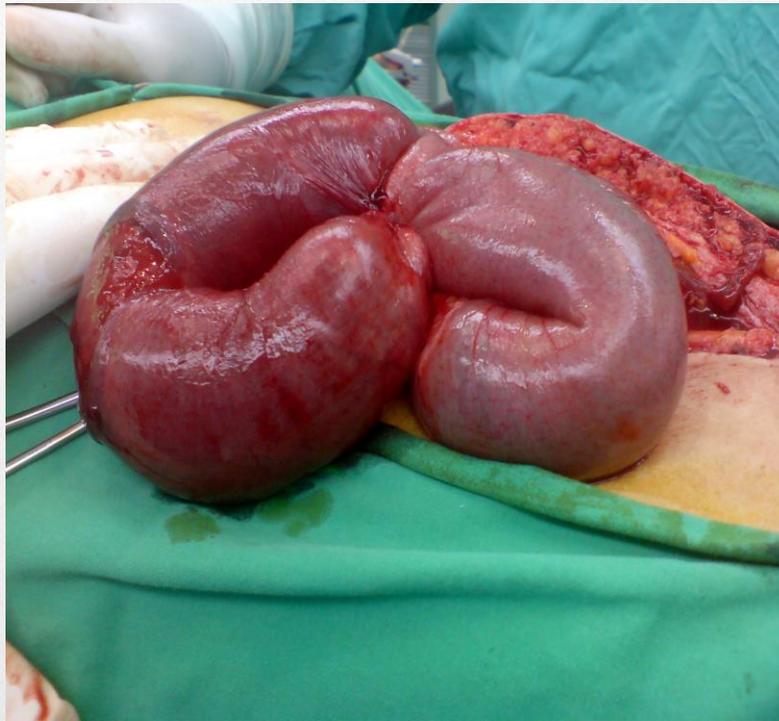
- Elderly patient mostly
- secondary to erosion of a large gallstone directly through the gall bladder into the duodenum.
- Classically, there is impaction about 60 cm proximal to the ileocecal valve.
- The characteristic radiological sign of gallstone ileus is Rigler's triad, comprising: small bowel obstruction, pneumobilia and an atypical mineral shadow on radiographs of the abdomen.



- The presence of two of these radiological signs has been considered pathognomonic of gallstone ileus and is encountered in 40–50% of the cases
- Treatment is surgery

Adhesions

- In Western countries where abdominal operations are common, adhesions and bands are the most common cause of small intestinal obstruction.
- 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.



Acute intussusception

- This occurs when one portion of the gut invaginates into an immediately adjacent segment; almost invariably, it is the proximal into the distal.
- Iliocolic more common in children
- In adults, colocolic intussusception is more common.

Summary box 71.4

Intussusception

- Most common in children
- Adult cases are secondary to intestinal pathology, e.g. polyp, Meckel's diverticulum
- Ileocolic is the commonest variety
- Can lead to an ischaemic segment
- Radiological reduction is indicated in most paediatric cases
- Adults require surgery

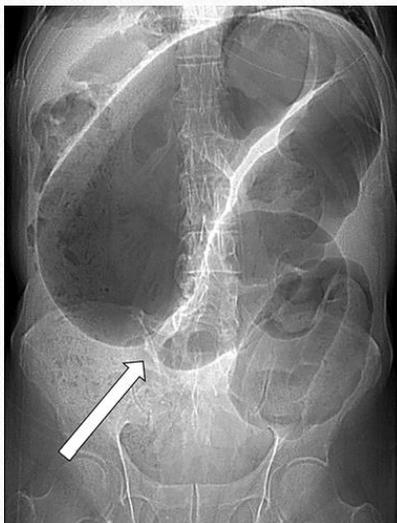


Volvulus

- A volvulus is a twisting or axial rotation of a portion of bowel about its mesentery
 - **sigmoid volvulus:**
 - most common in the elderly or institutionalized, as well as patients with neurologic disorders.
 - It is an acquired condition resulting from sigmoid redundancy with narrowing of the mesenteric pedicle

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- Dx : symptoms of IO
 - X-ray : inverted U
 - Tx : no sign of peritonitis : stabilization of the patient + sigmoidoscopic decompression + elective sigmoidectomy
 - Signs of peritonitis (perforation or ischemia) → surgery (laparotomy + Hartman procedure)

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- Cecal volvulus :
 - occurs in a younger population
 - congenital failure of appropriate cecal tethering
 - Dx : symptoms of IO + coffee bean sign on x ray
 - Tx : stabilization + urgent surgery for ilio-cecal resection
 - (high failure rate for cecal colonoscopic deflation or cecopexy)



Cecal volvulus

Sigmoid
volvulus





Cardinal clinical features of acute obstruction

- Abdominal pain
- Distension
- Vomiting
- Absolute constipation

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- Obstruction may be classified clinically into two types:
 - small bowel obstruction – high or low;
 - large bowel obstruction
 - The nature of the presentation will also be influenced by whether the obstruction is:
 - complete;
 - incomplete.

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- **simple** – in which the blood supply is intact
 - **strangulating/strangulated** – in which there is interference to blood flow
 - Late manifestations of intestinal obstruction that may be encountered include dehydration, oliguria, hypovolemic shock, pyrexia, septicemia, respiratory embarrassment and peritonism.
 - In all cases of suspected intestinal obstruction, the hernial orifices must be examined.

Summary box 71.2

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

The clinical features vary according
to:

- The location of the obstruction
- The duration of the obstruction
- The underlying pathology
- The presence or absence of intestinal ischemia

Features of obstruction

- In **high small bowel obstruction**, vomiting occurs early, is profuse and causes rapid dehydration. Distension is minimal with little evidence of dilated small bowel loops on abdominal radiography
- In **low small bowel obstruction**, pain is predominant with central distension. Vomiting is delayed. Multiple dilated small bowel loops are seen on radiography
- In **large bowel obstruction**, distension is early and pronounced. Pain is less severe and vomiting and dehydration are later features. The colon proximal to the obstruction is distended on abdominal radiography. The small bowel will be dilated if the ileocaecal valve is incompetent.

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- Pain : sudden , sever , colicky , umbilical (SBO) or lower abdomen (LBO). With more distention – pain become diffuse
 - Sever continuous pain → think about strangulation
 - Constipation : absolute or relative
 - As obstruction progresses the character of the vomitus alters from digested food to feculent material, as a result of the presence of enteric bacterial overgrowth .

Other manifestation

- Dehydration: most commonly with SBO due to vomiting and fluid sequestration .
- ***Pyrexia*** : Pyrexia in the presence of obstruction is rare and may indicate: the onset of ischemia; intestinal perforation; inflammation or abscess associated with the obstructing disease.
- ***Abdominal tenderness***: Localized tenderness indicates impending or established ischemia.

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- Bowel sounds: usually high pitched
 - Absent bowel sound : obstruction is longstanding, and the small bowel has become inactive.
 - Generalized tenderness and the presence of rigidity indicate the need for early laparotomy.
 - When strangulation occurs in an external hernia, the lump is tense, tender and irreducible and there is no expansile cough impulse.
 - Skin changes with erythema or purplish discoloration are associated with underlying ischemia

Clinical features of strangulation

- Constant pain, severe pain
 - Tenderness with rigidity and peritonism
 - Shock
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Approach

- History : cardinal symptoms
- Don't forget to ask about previous abdominal surgery , previous colonoscopy , previous irradiation
- Previous attack of bowel obstruction
- History of hernia
- Changes in the bowel motion , symptoms of anemia
- Tenesmus , change in the stool caliber , blood per rectum , weight loss , medical hx if IBD , family or personal hx of colon cancer

Physical examination

General appearance

Vital sign and
assessment of the
hydration status

Abdominal exam
looking for level of
distention, tenderness
, skin changes.

Hernia orifice
examination (looking
for strangulated hernia
sign)

Auscultation.

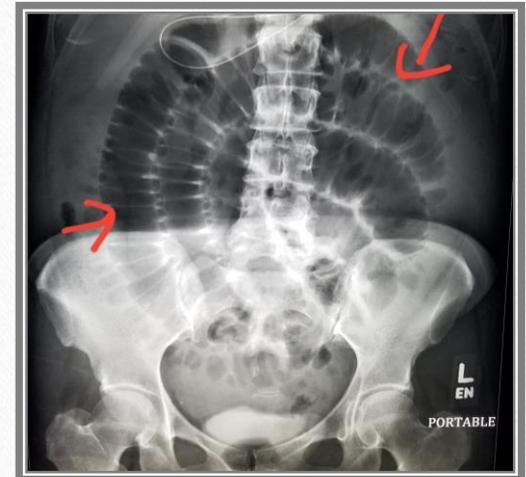
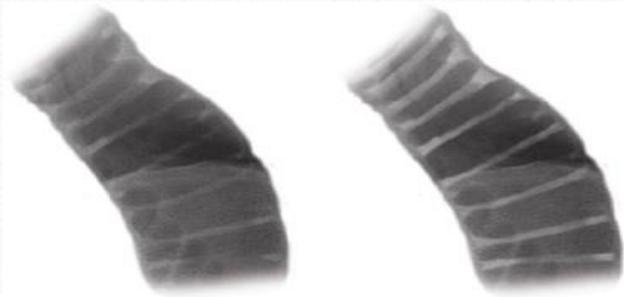
Don't forget to do
digital rectal
examination

Investigation labs

- CBC
- Serum electrolytes and liver function test
- Serum amylase
- Coagulation test
- Urine analysis

Images abdominal x ray

Two view : supine and standing





CT scan

Identification the site and cause of the obstruction, closed loop

It helps to look for ischemia and strangulation , pneumatosis intestinal , free air , abscess.

To rule out other causes of acute abdomen

With oral and IV contrast

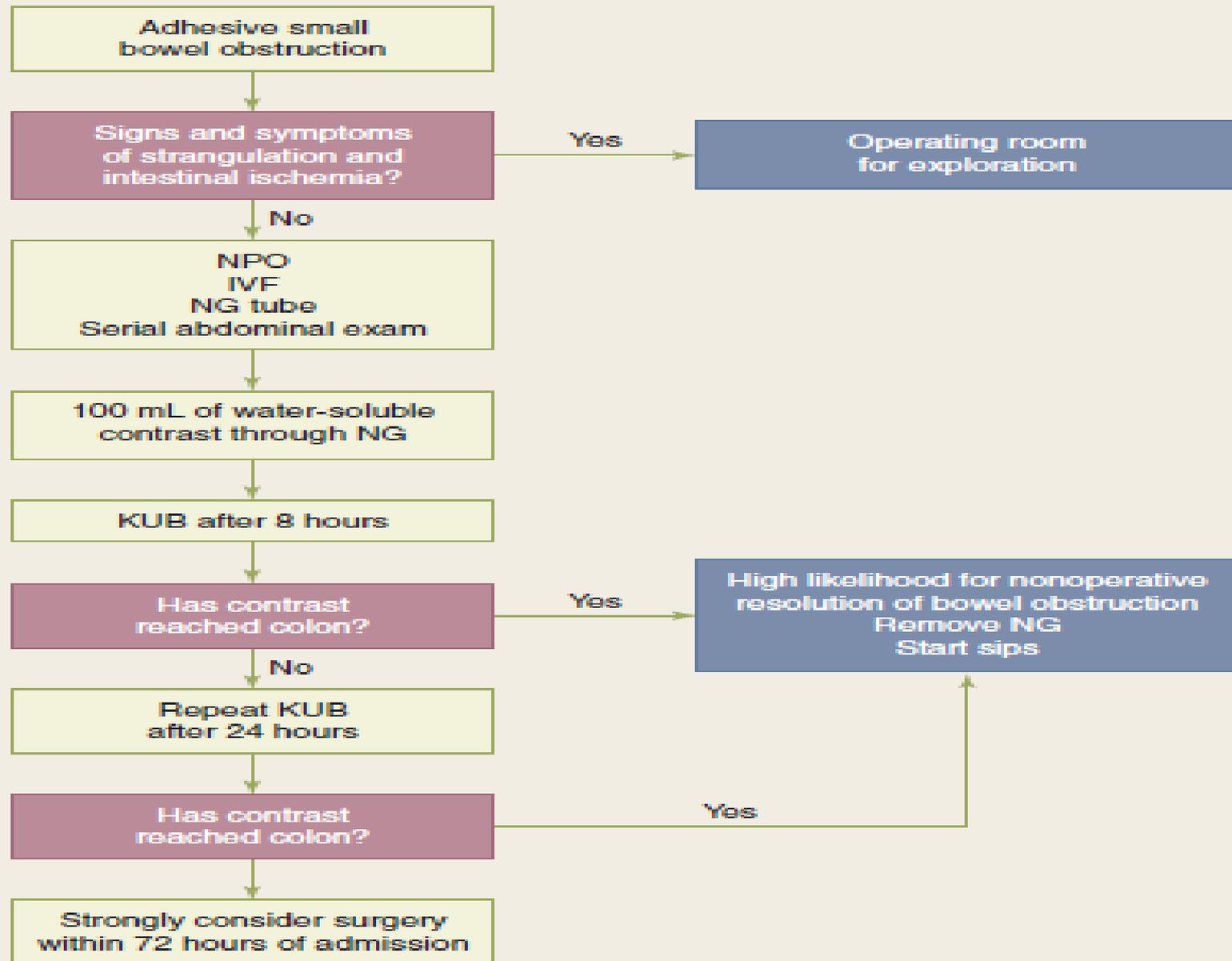
Oral contrast diagnostic and therapeutic in cases of adhesive bowel obstruction



CT

- the presence of a combination of these findings increases the reliability of diagnosing ischemia :
- Poor or absent segmental bowel wall enhancement
- Delayed hyperenhancement Bowel wall thickening
- Air in the bowel wall (pneumatosis intestinalis)
- Edematous, thickened mesentery
- Engorgement of mesenteric vessels
- Portal or mesenteric venous gas

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- Gastrografin draws fluid into the lumen of the bowel due to its hypertonicity, decreasing intestinal wall edema and stimulating intestinal peristalsis.
 - Antibiotics are warranted for patients with suspected bowel compromise (ie, ischemia, necrosis, or perforation), and standard perioperative prophylactic antibiotics should be administered to those who undergo operative exploration, depending upon the expected wound classification

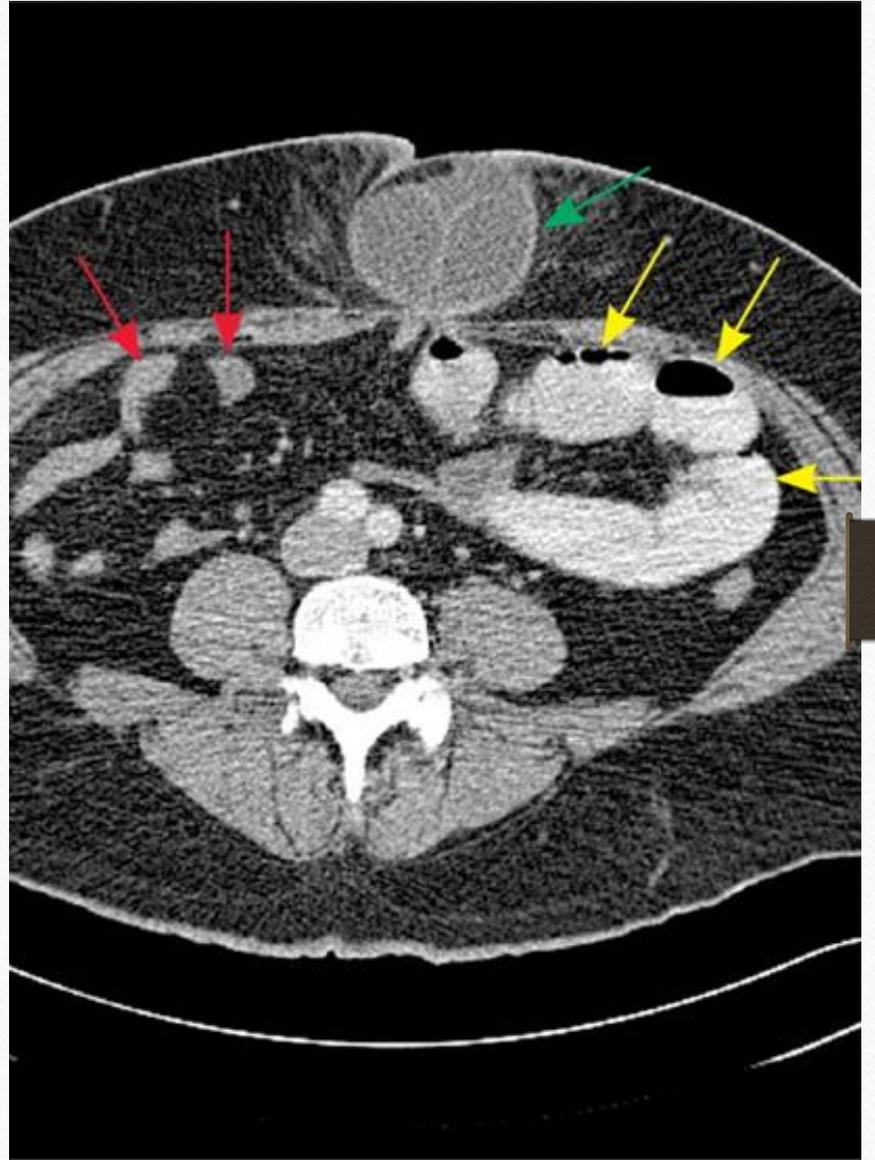
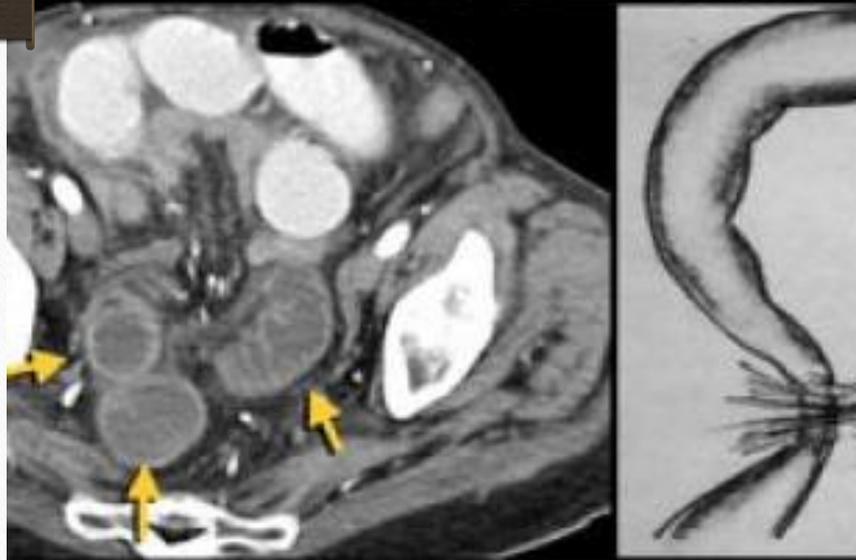


Treatment of acute intestinal obstruction

- Gastrointestinal drainage via a nasogastric tube
- Fluid and electrolyte replacement
- Relief of obstruction
- Surgical treatment is necessary for most cases of intestinal obstruction but should be delayed until resuscitation is complete, provided there is no sign of strangulation or evidence of closed-loop obstruction

Indication for surgical management

- IO with peritonitis
- Intestinal ischemia , perforation , pneumatosis
- Closed loop obstruction
- Complicated sigmoid volvulus + cecal volvulus
- Failure of conservative management .
- Post op (if you suspect a technical problem as a cause of the obstruction) .



ADYNAMIC OBSTRUCTION

Paralytic ileus

- state in which there is failure of transmission of peristaltic waves secondary to neuromuscular failure
- The resultant stasis leads to accumulation of fluid and gas within the bowel, with associated distension, vomiting, absence of bowel sounds and absolute constipation.
- Colicky pain is not a feature
- Distention , effortless vomiting
- gas-filled loops of intestine with multiple fluid Levels on abdominal x ray
- Post operative ileus take clinical significance if persist more than 72 h

Table 28-4

Ileus: common etiologies

Abdominal surgery
Infection
Sepsis
Intra-abdominal abscess
Peritonitis
Pneumonia
Electrolyte abnormalities
Hypokalemia
Hypomagnesemia
Hypermagnesemia
Hyponatremia
Medications
Anticholinergics
Opiates
Phenothiazines
Calcium channel blockers
Tricyclic antidepressants
Hypothyroidism
Ureteral colic
Retroperitoneal hemorrhage
Spinal cord injury
Myocardial infarction
Mesenteric ischemia

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- NPO , NG tube , correction of electrolytes abnormality
 - restriction of oral intake until bowel sounds and the passage of flatus return.
 - If paralytic ileus is prolonged CT scanning is the most effective investigation; it will demonstrate any intraabdominal sepsis or mechanical obstruction and therefore guide any requirement for laparotomy.
 - The need for a laparotomy becomes increasingly likely the longer the bowel inactivity persists, particularly if it lasts for more than seven days

Colonic pseudo-obstruction

- Acute (Ogilvie's syndrome) or chronic
- Abdominal radiographs show evidence of colonic obstruction, with marked caecal distension being a common feature.
- caecal perforation is a well recognized complication.
- The absence of a mechanical cause
- requires urgent confirmation by colonoscopy or a single contrast water-soluble barium enema or CT



Factors associated with pseudo-obstruction

- Metabolic
 - Diabetes
 - Hypokalaemia
 - Uraemia
 - Myxodoema
 - Intermittent porphyria
- Severe trauma (especially to the lumbar spine and pelvis)
- Shock
 - Burns
 - Myocardial infarction
 - Stroke
- Idiopathic
- Septicaemia
- Postoperative (for example fractured neck of femur)
- Retroperitoneal irritation
 - Blood
 - Urine
 - Enzymes (pancreatitis)
 - Tumour
- Drugs
 - Tricyclic antidepressants
 - Phenothiazines
 - Laxatives
- Secondary gastrointestinal involvement
 - Scleroderma
 - Chagas' disease

Tx: stabilization of the patient

Treatment of underlying cause

Neostigmine

Colonoscopy deflation

Surgery (peritonitis , perforation , ischemia)