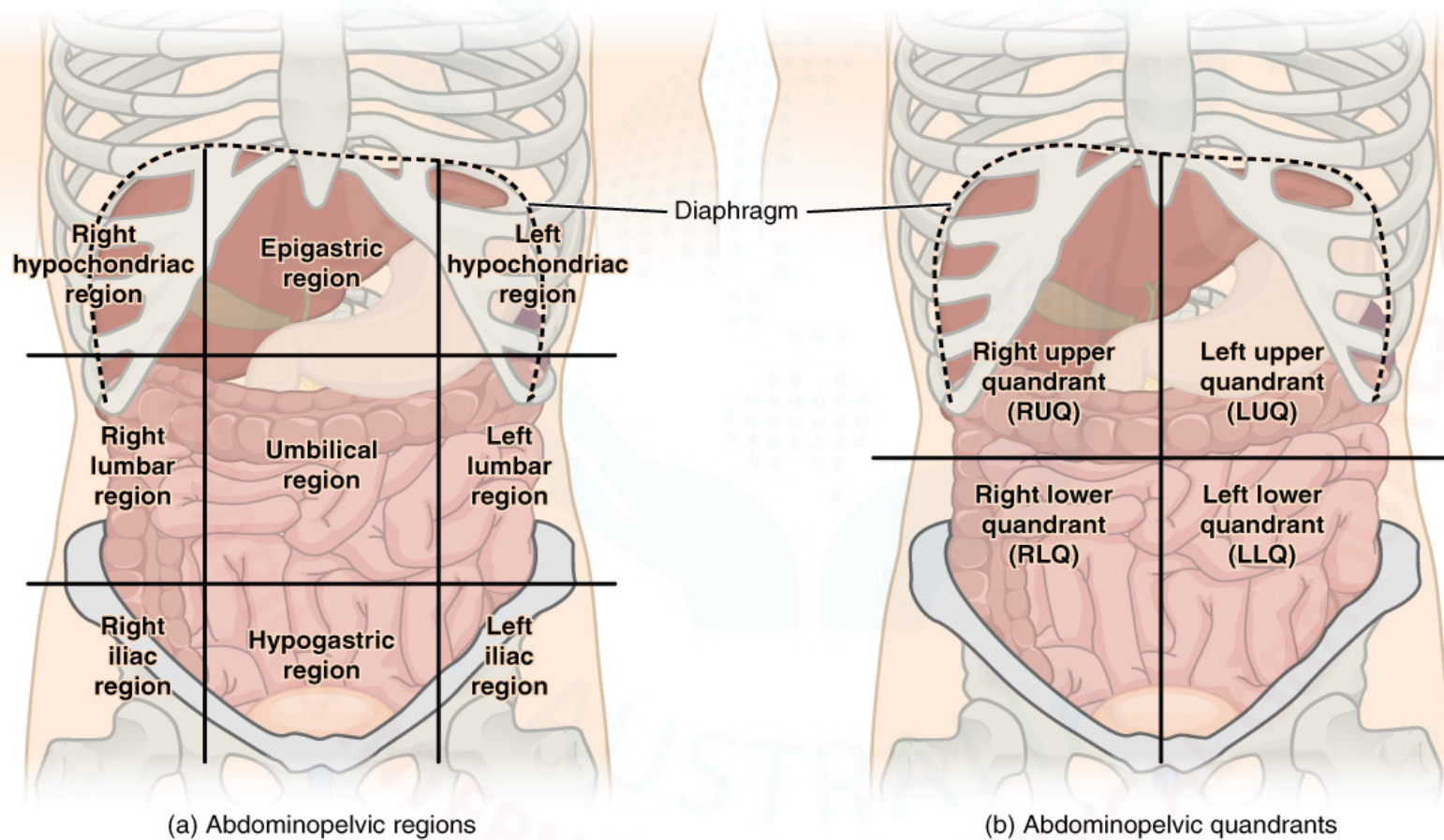
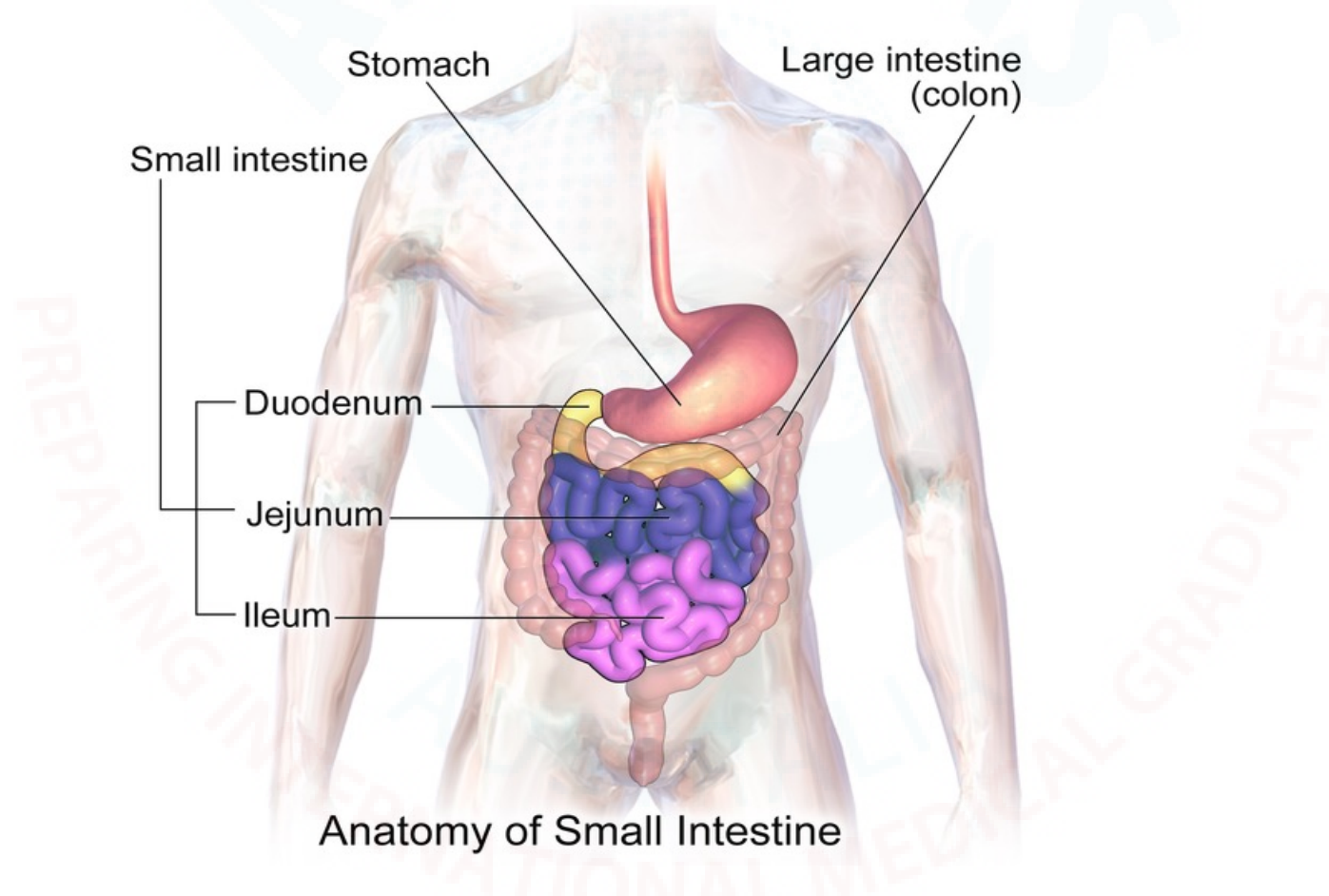


GENERAL SURGERY

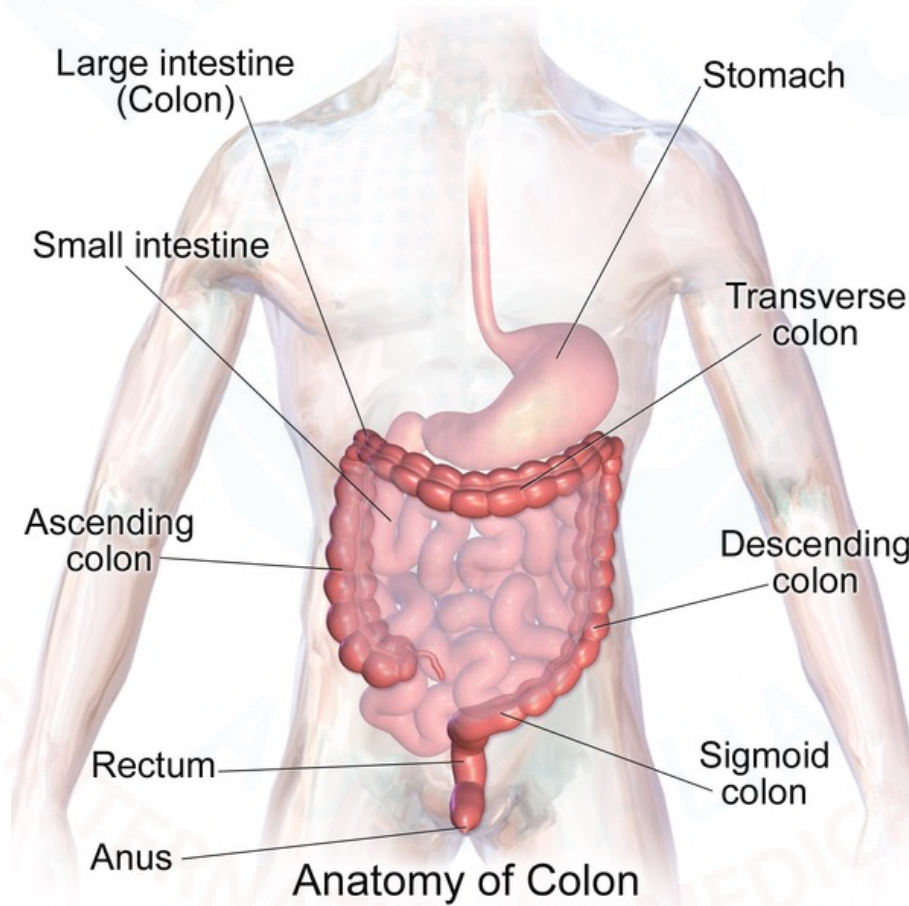
ABDOMEN



SMALL INTESTINE



LARGE INTESTINE



SMALL BOWEL OBSTRUCTION

Small bowel obstruction is a common surgical emergency due to mechanical blockage of the bowel.

CLINICAL FEATURES:

1. Central abdominal colicky pain
2. Vomiting- usually happens early
3. Nausea
4. Abdominal distention- usually minimal

EXAMINATION FINDINGS

1. The bowel sounds may be reduced and high pitched.
2. Abdominal tenderness on physical examination may be diffuse or focal with the presence of distention.
3. There may be signs of peritonitis such as rebound tenderness, guarding, and rigidity and signify late findings that may be present depending on the time of presentation.
4. Evaluation for hernias, surgical scars, masses including in the rectum, and fecal impactions may demonstrate the possible etiology.
5. There may be signs and symptoms of dehydration and sepsis as well. Always look out for electrolyte imbalances due to vomiting- **Hypokalemic Hypochloremic Metabolic Alkalosis**

CAUSES

1. Postsurgical adhesions (M/C)
2. Incarcerated hernias
3. Malignancy
4. Stool impaction
5. Foreign bodies
6. Volvulus

INVESTIGATIONS AND MANAGEMENT

FIRST STEP- X-Ray- Abdominal Erect

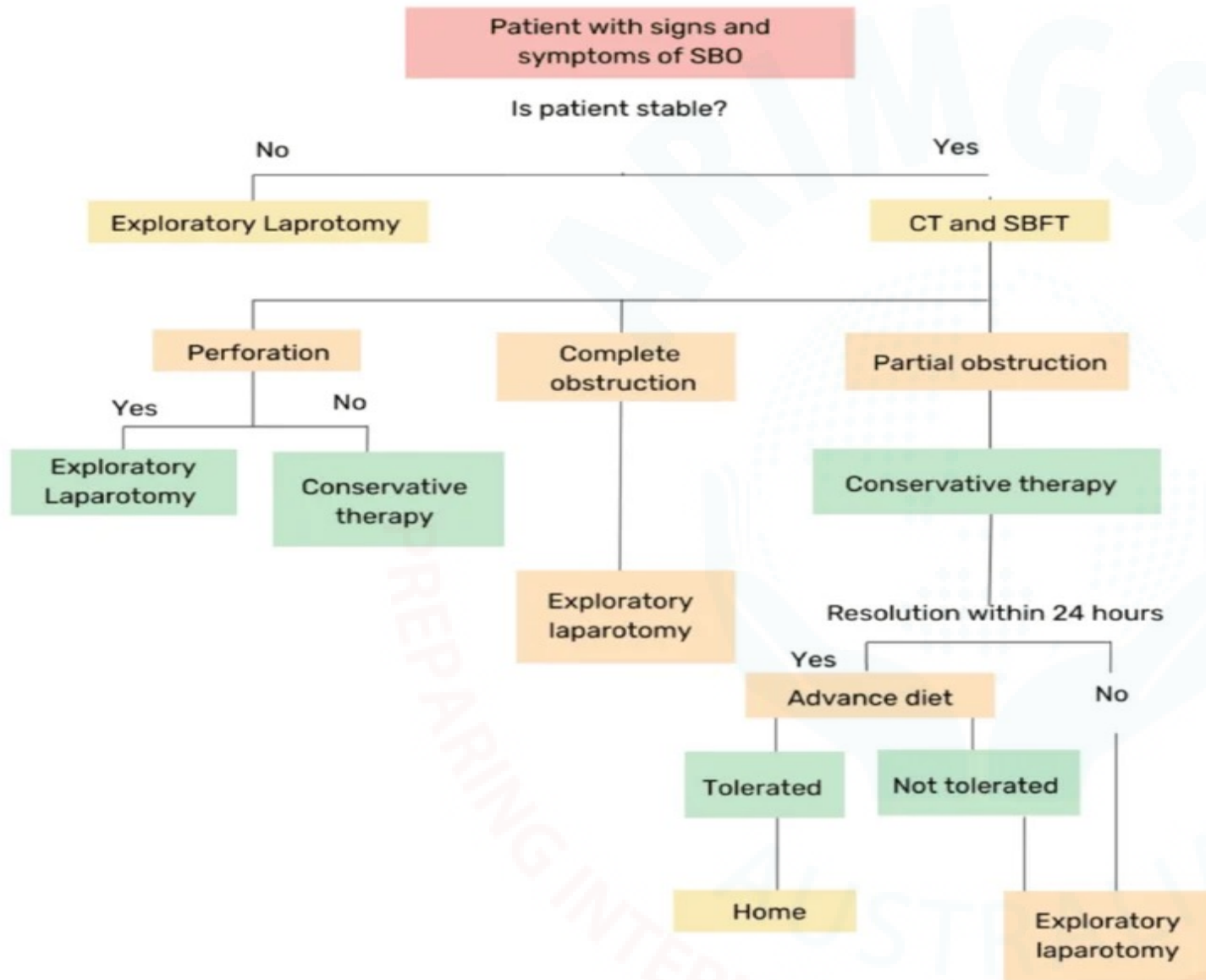
Multiple air fluid levels

NEXT STEP- Gastrografin Meal- can be therapeutic if due to adhesions.

BEST STEP- CT

MANAGEMENT:

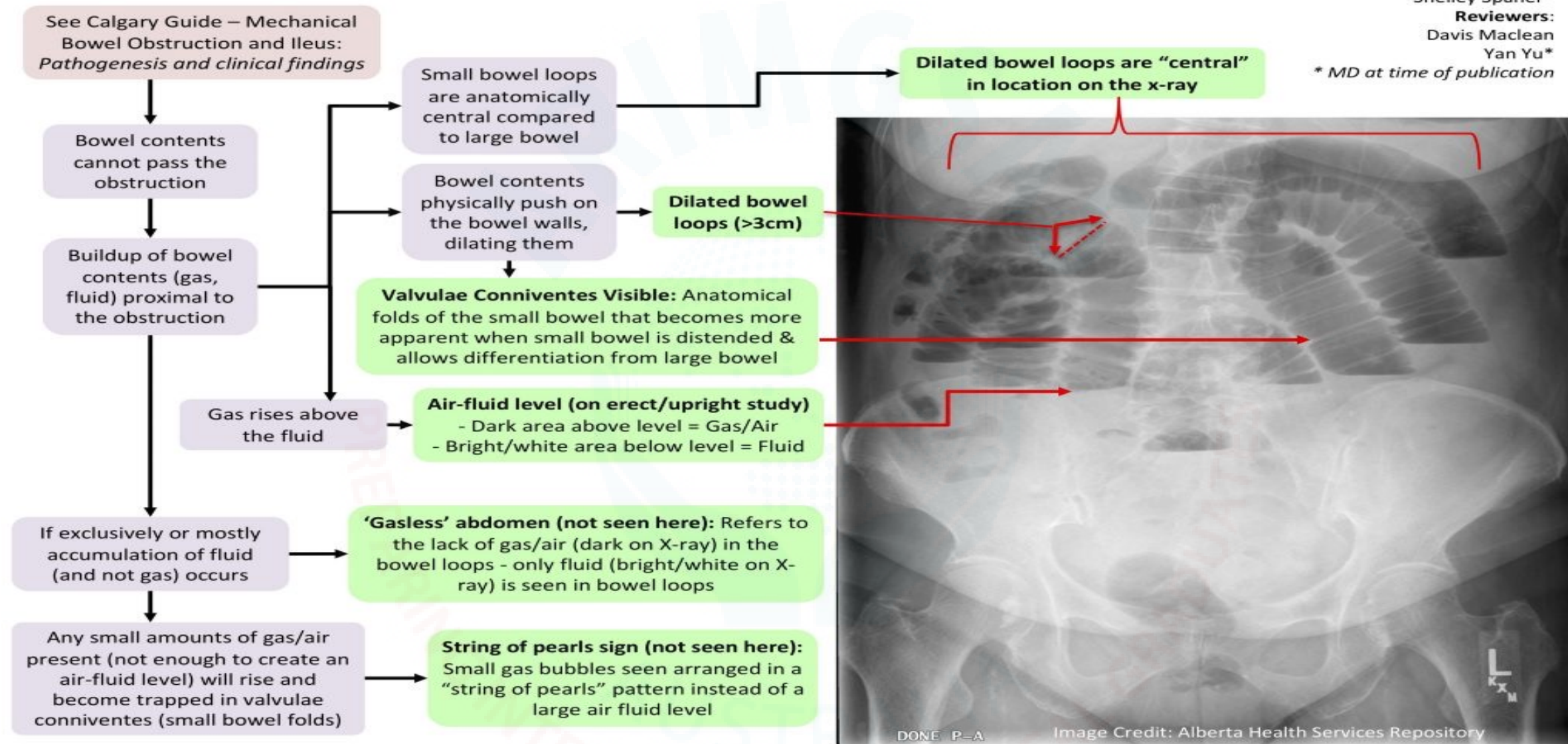
1. Do ABCDs
2. NPO
3. RILES TUBE
4. SURGERY- Emergency surgery is indicated in:
 - ✓ Perforation or impending perforation(severe pain, guarding, rigidity, rebound tenderness , hypotension, persistent vomiting, absent bowel sound)
 - ✓ Strangulated small bowel obstruction (mechanical SBO with reduced blood supply to the bowel)



SBFT – Small bowel follow through with water soluble gastrografen – draws fluid into lumen(osmotic effect) and stimulate peristalsis

Small Bowel Obstruction: Findings on X-Ray

Authors:
Evan Allarie
Shelley Spaner*
Reviewers:
Davis Maclean
Yan Yu*
* MD at time of publication



Legend: Pathophysiology Mechanism Sign/Symptom/Lab Finding Complications

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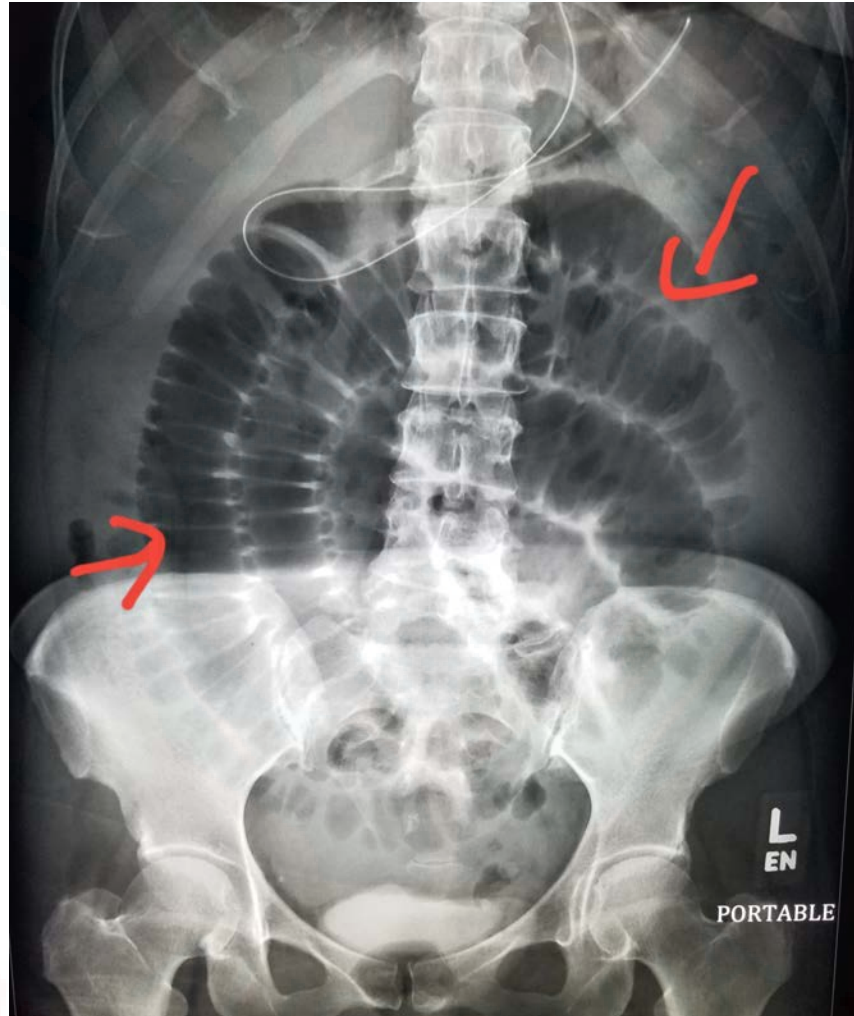


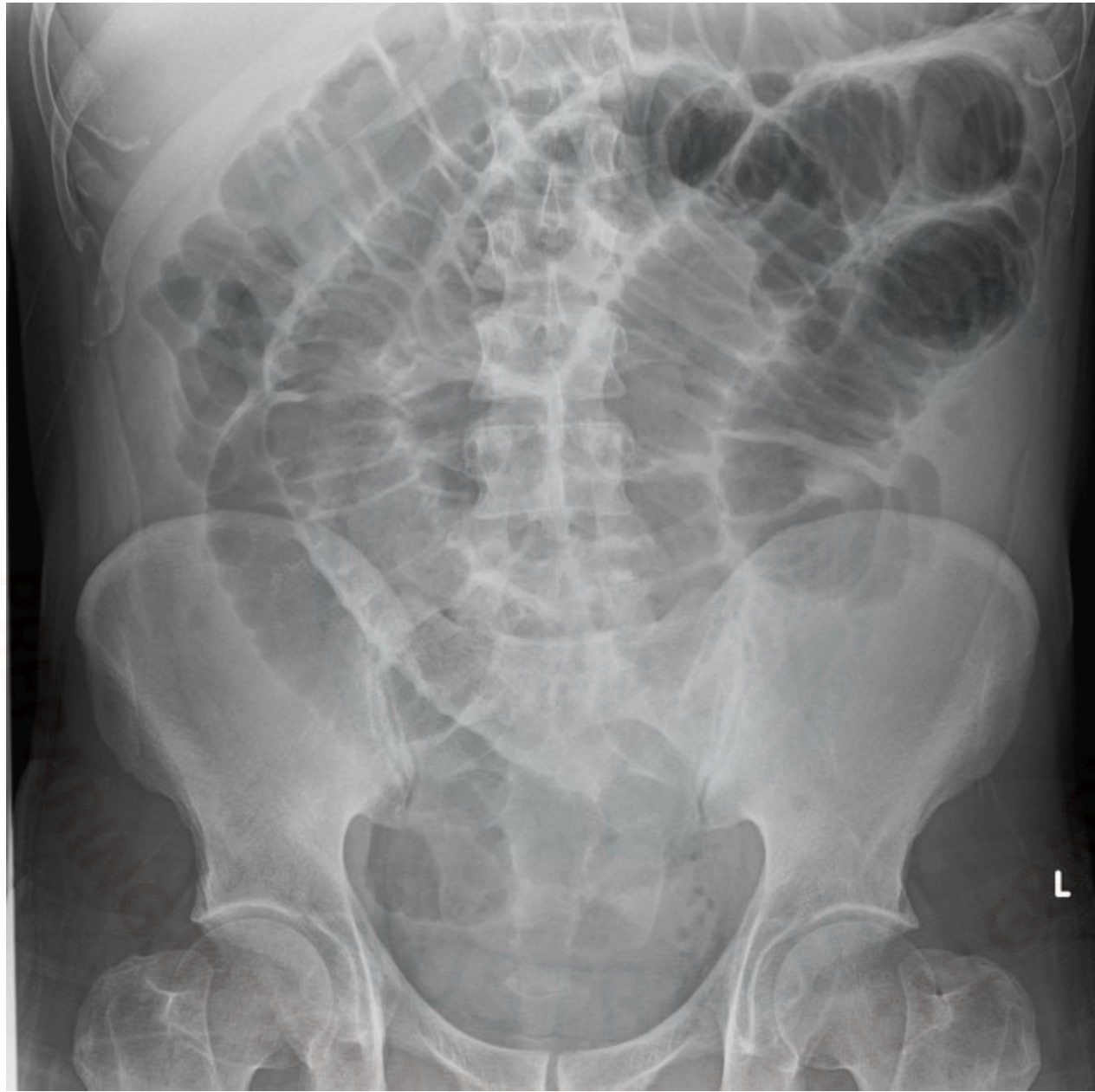
Supine film



NG tube

Dilated small
bowel loops





LARGE BOWEL OBSTRUCTION

CLINICAL FEATURES:

1. Early and increased distention
2. Colicky abdominal pain- not as severe as SBO
3. Nausea and vomiting- not as severe as SBO
4. Constipation
5. Obstipation (complete failure to pass stool and flatus)

CAUSES

Can be classified as either extrinsic, intrinsic, or intraluminal.

1. **Extrinsic**- Hernias, adhesions, peritoneal metastasis, **volvulus(Elderly)**
2. **Intrinsic- Cancer (M/C)**, inflammatory strictures, intussusception, diverticular strictures, Meckel's diverticulum, lymphoma
3. **Intraluminal**- Gallstone ileus, ingested foreign body, fecal impaction

INVESTIGATIONS AND MANAGEMENT

INVESTIGATIONS:

First Step- X-RAY

Best Step- CT

MANAGEMENT:

‘Drip and suck’

1. IV line and NPO
2. Fluids
3. NG tube
4. Analgesics

PATIENT WITH SUSPECTED LBO



Initial assessment & resuscitation

- ABCDE
 - NBM
 - IV fluids + electrolyte correction
 - Analgesia / antiemetics
 - Bloods (FBC, UEC, CRP, Lactate, Group & Hold)
 - Urgent surgical review
-



CT Abdomen/Pelvis with IV contrast

→ Confirm diagnosis

→ Identify cause + level + complications



Are there RED FLAGS?

- Peritonitis
- Perforation / free air
- Bowel ischemia / strangulation
- Sepsis / shock
- Caecum >12 cm

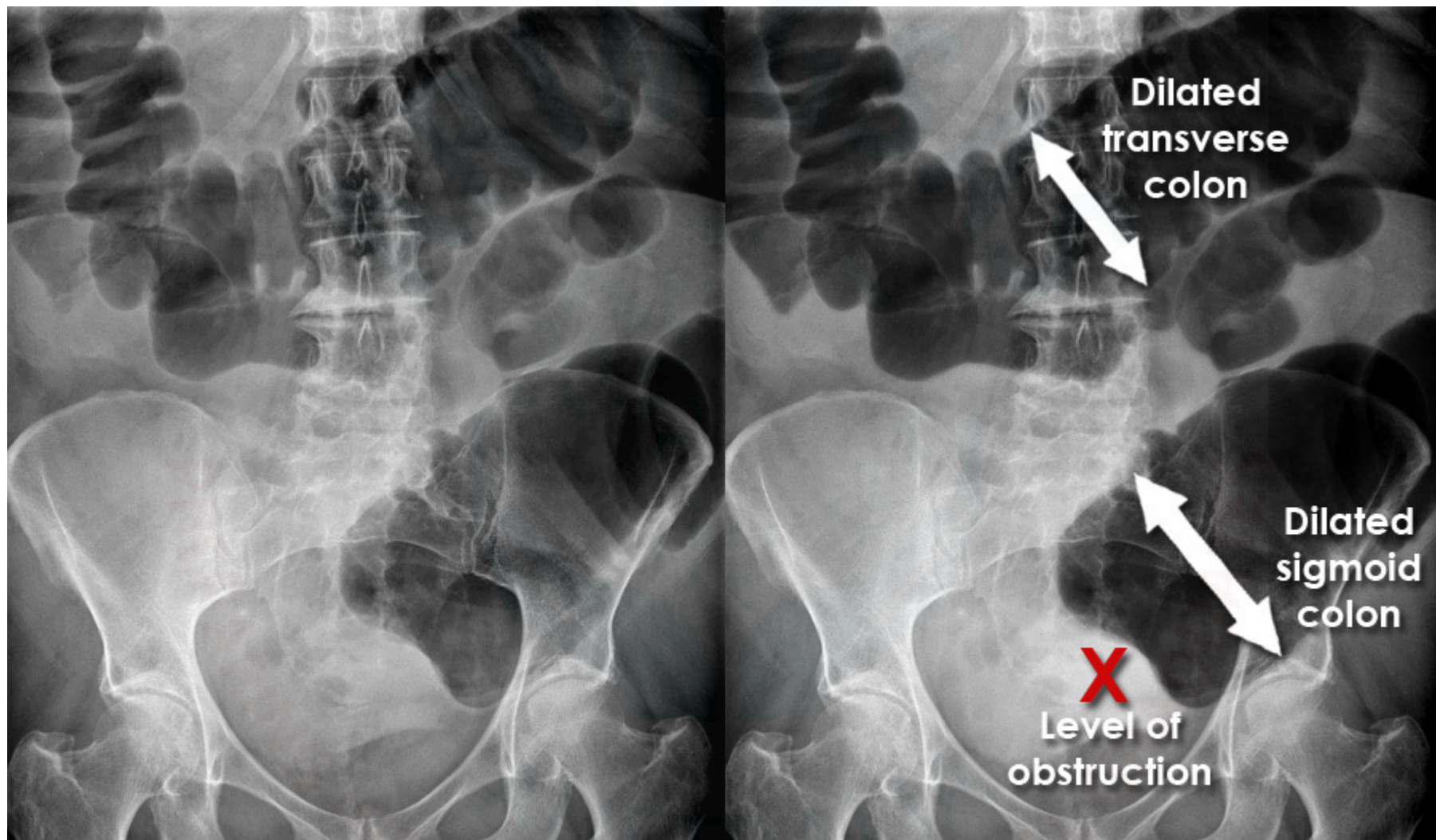


YES → EMERGENCY SURGERY

- Resection ± stoma
- Damage control if unstable



NO → Cause-directed management



Cause-Directed Pathway

Malignant obstruction

Fit patient + resectable tumour

→ Urgent surgery OR stent → elective surgery

Unfit / metastatic / palliative

→ **Self-expanding metal stent (SEMS)** - a mesh metallic tube placed endoscopically to open an obstructed bowel lumen.

→ Surgery only if stent fails

Sigmoid volvulus

No ischemia / perforation

→ Flexible sigmoidoscopy decompression

If failed OR ischemia present

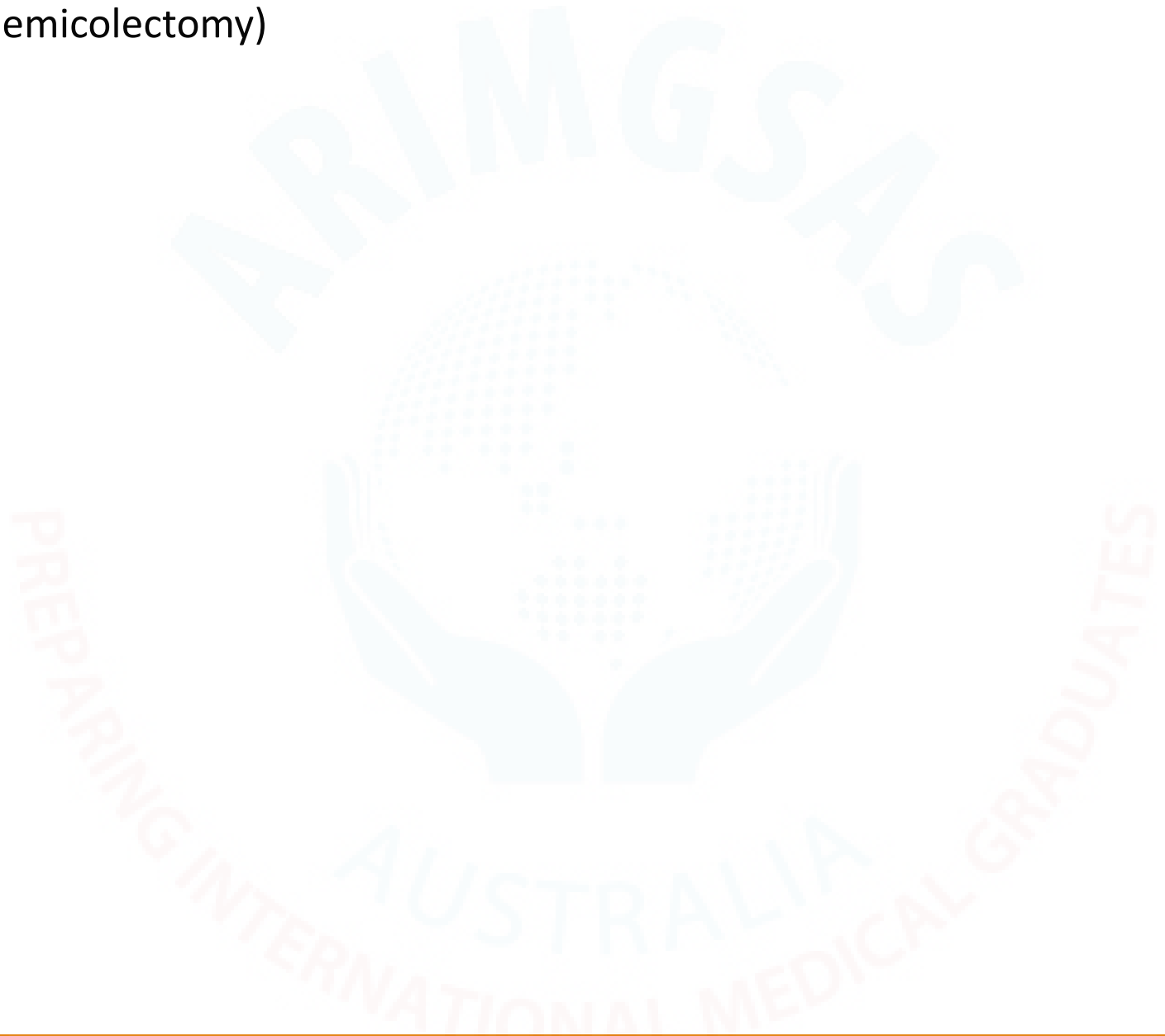
→ Emergency surgery

Caecal volvulus

→ Surgery (usually right hemicolectomy)

Faecal impaction

- Enema
- Manual disimpaction
- Laxatives



Pseudo-obstruction (Ogilvie syndrome) – acute dilatation of large bowel without mechanical obstruction : mimics LBO but there is no physical obstruction: decrease parasympathetic activity (weak bowel contractions and poor motility) and increased sympathetic tone(bowel movement is inhibited & colon is functionally obstructed).

Causes

Very commonly seen in hospitalised or unwell patients

Surgical / medical illness

recent surgery (especially orthopaedic, obstetric, spinal)

trauma / burns

sepsis

MI / stroke

Drugs

opioids

Anticholinergics

calcium channel blockers

antidepressants

Neurological disease

Parkinson's

spinal cord injury



Clinical features

progressive abdominal distension (very prominent)

mild–moderate abdominal pain

nausea / vomiting

constipation or obstipation

bowel sounds may be present

Exclude mechanical obstruction (CT scan)



Conservative management

- Stop offending drugs
- Correct electrolytes
- Mobilise patient



Persistent / caecum >10–12 cm

→ IV neostigmine (ACHE inhibitor)



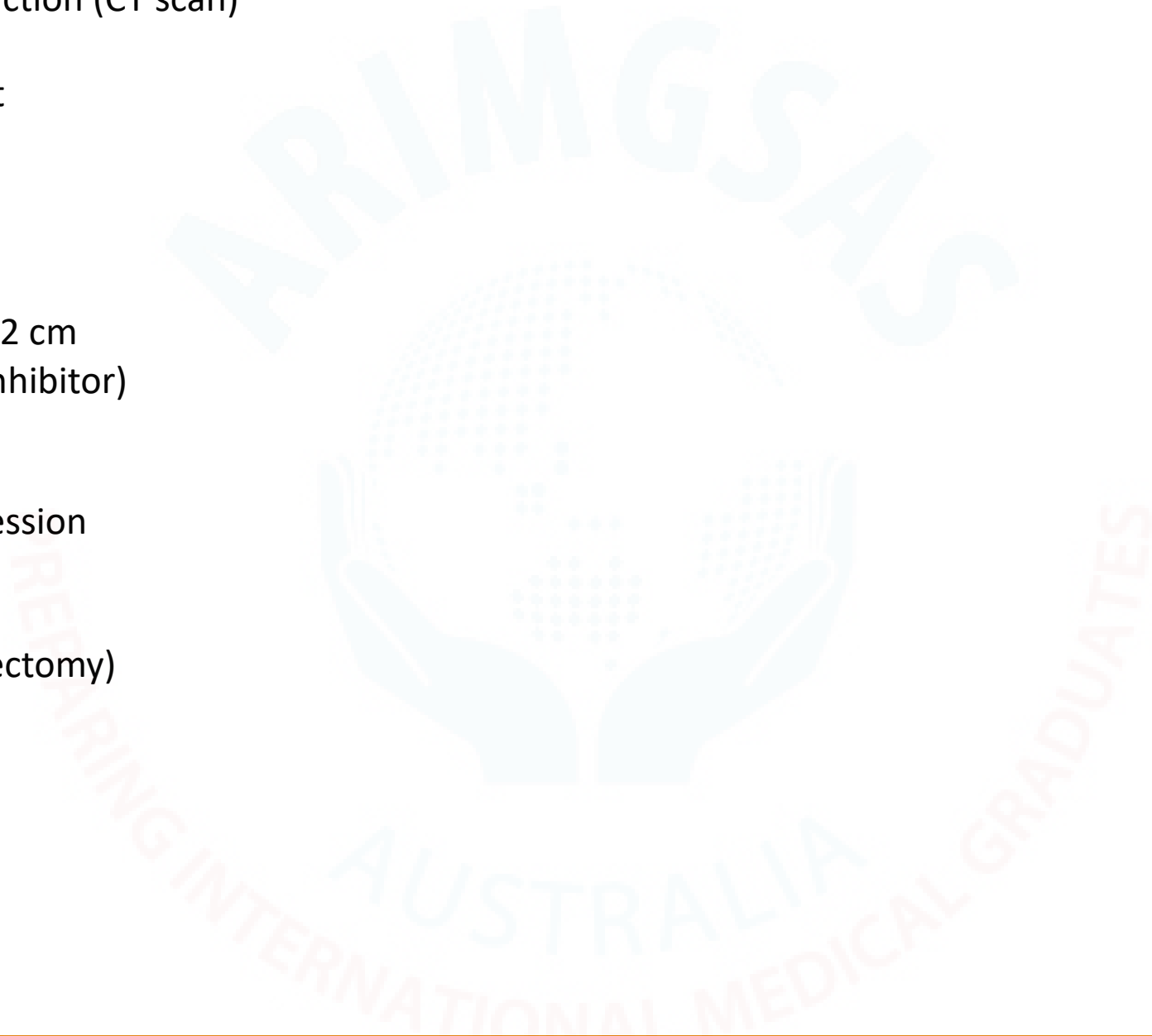
Failure

→ Colonoscopic decompression



Perforation risk

→ Surgery (segmental colectomy)



A 72-year-old man is admitted following **hip fracture surgery**. On day 4 post-operation he develops **progressive abdominal distension**, mild diffuse abdominal discomfort and nausea. He has not passed stool for 3 days but reports passing small amounts of flatus.

On examination:

abdomen markedly distended

mild generalized tenderness

bowel sounds present

no guarding or rebound

Vital signs are stable.

Blood tests show mild hypokalaemia.

CT abdomen shows **dilated colon with no obstructing lesion**.

What is the **most appropriate next step in management**?

- A. Emergency laparotomy
- B. Colonoscopic stent insertion
- C. Start IV neostigmine
- D. Start oral laxatives
- E. Immediate right hemicolectomy

A 72-year-old man is admitted following **hip fracture surgery**. On day 4 post-operation he develops **progressive abdominal distension**, mild diffuse abdominal discomfort and nausea. He has not passed stool for 3 days but reports passing small amounts of flatus.

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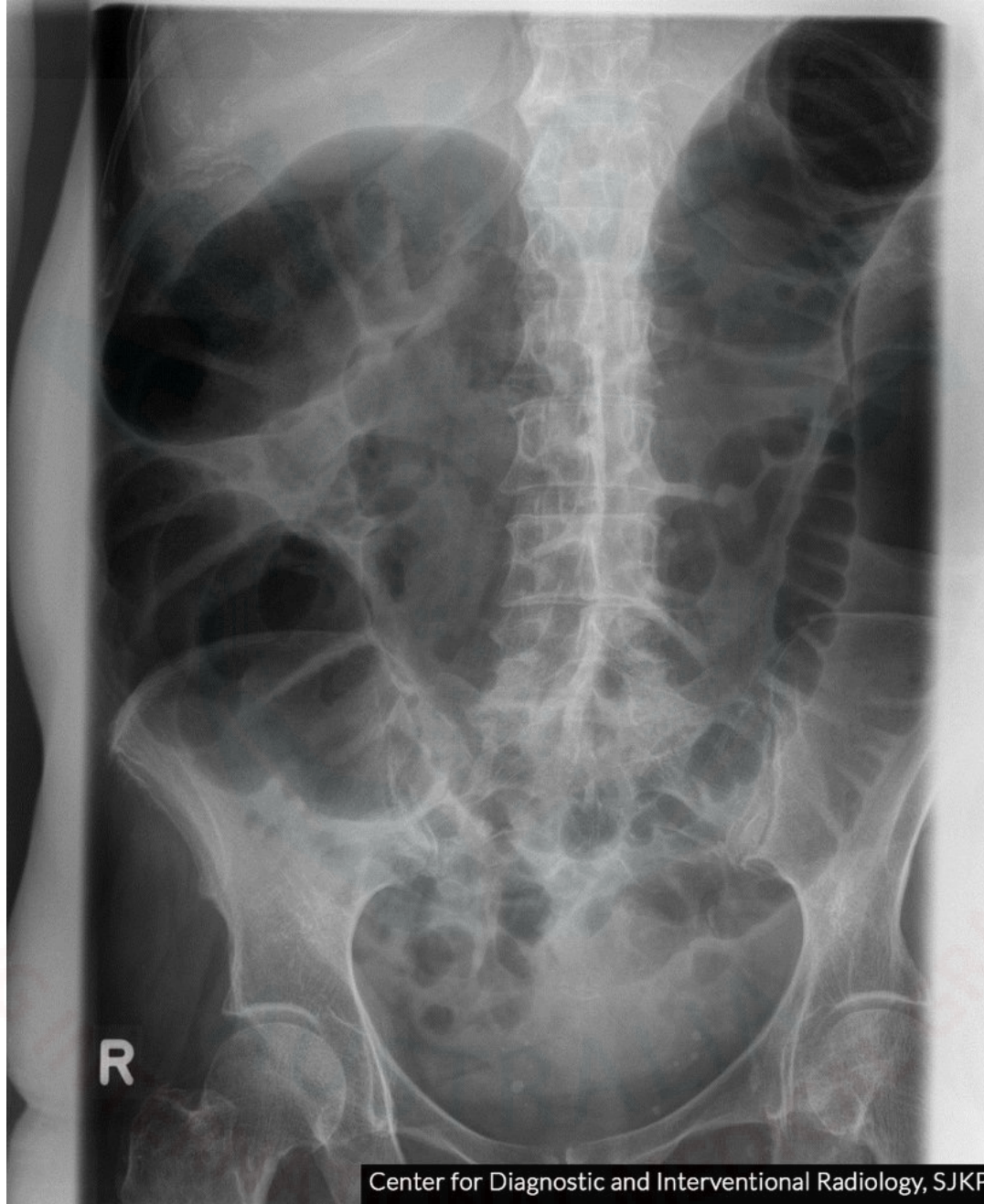
Blood tests show mild hypokalaemia.

CT abdomen shows **dilated colon with no obstructing lesion**.

What is the **most appropriate next step in management**?

Options

- A. Emergency laparotomy (no signs of peritonitis)
- B. Colonoscopic stent insertion (used in malignant obstruction)
- C. **Start IV neostigmine**
- D. Start oral laxatives (can worsen dilatation)
- E. Immediate right hemicolectomy (1st step always non - surgical)



Center for Diagnostic and Interventional Radiology, SJKP

Plain Films: Abdominal X-Ray (AXR)

Findings: Small (SBO) vs. Large Bowel Obstructions (LBO)

- Look at caliber, lines, and location to differentiate SBO vs LBO
- Air fluid levels on upright x ray are neither specific nor sensitive and cannot help distinguish ileus, enteritis, or partial from complete SBO



Small Bowel Obstruction

SMALL	LARGE
3cm max diameter	6cm max diameter
Lines all the way across the bowel	Lines not fully across (Haustra)
Central	Peripheral



Large Bowel Obstruction

BOWEL OBSTRUCTION (CONTD)

The rule of 3-6-9 for bowel obstruction

The small bowel is normally <3cm in diameter. If it is >6cm it is at high risk of rupture.

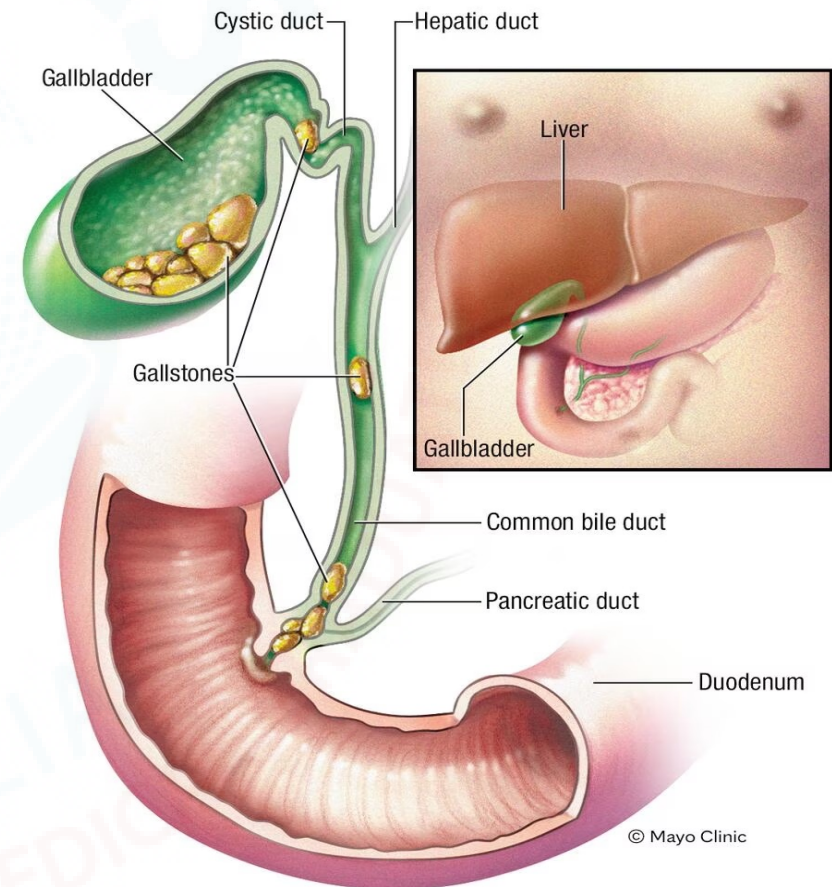
The large bowel is normally <6cm in diameter. If it is >9cm it is at high risk of rupture.

RUQ- GALLBLADDER PATHOLOGIES

CHOLELITHIASIS:

RISK FACTORS:

1. Majority are asymptomatic
2. Fat
3. Female
4. Fertile
5. Forty
6. Obesity/Pregnancy
7. DM/HRT



SYMPTOMS

1. Acute / constant pain- Biliary colic
2. Nausea
3. Vomiting
4. Pain is in the RUQ sometimes radiating to the scapula
5. A fatty meal can precipitate pain
6. Pain typically presents late at night and can be relieved by leaning forward.

INVESTIGATIONS

FIRST TEST: Abdominal USG – less expensive and first line investigation for gall stones.

CT / MRCP is **diagnostic** but more expensive to the patient.



MANAGEMENT

Analgesics

Anti emetics

Gallstone dissolution with **ursodeoxycholic acid** or lithotripsy(in patients who are not eligible for surgery) – This needs a functional GB ,stone< 10 mm and no signs of infection.

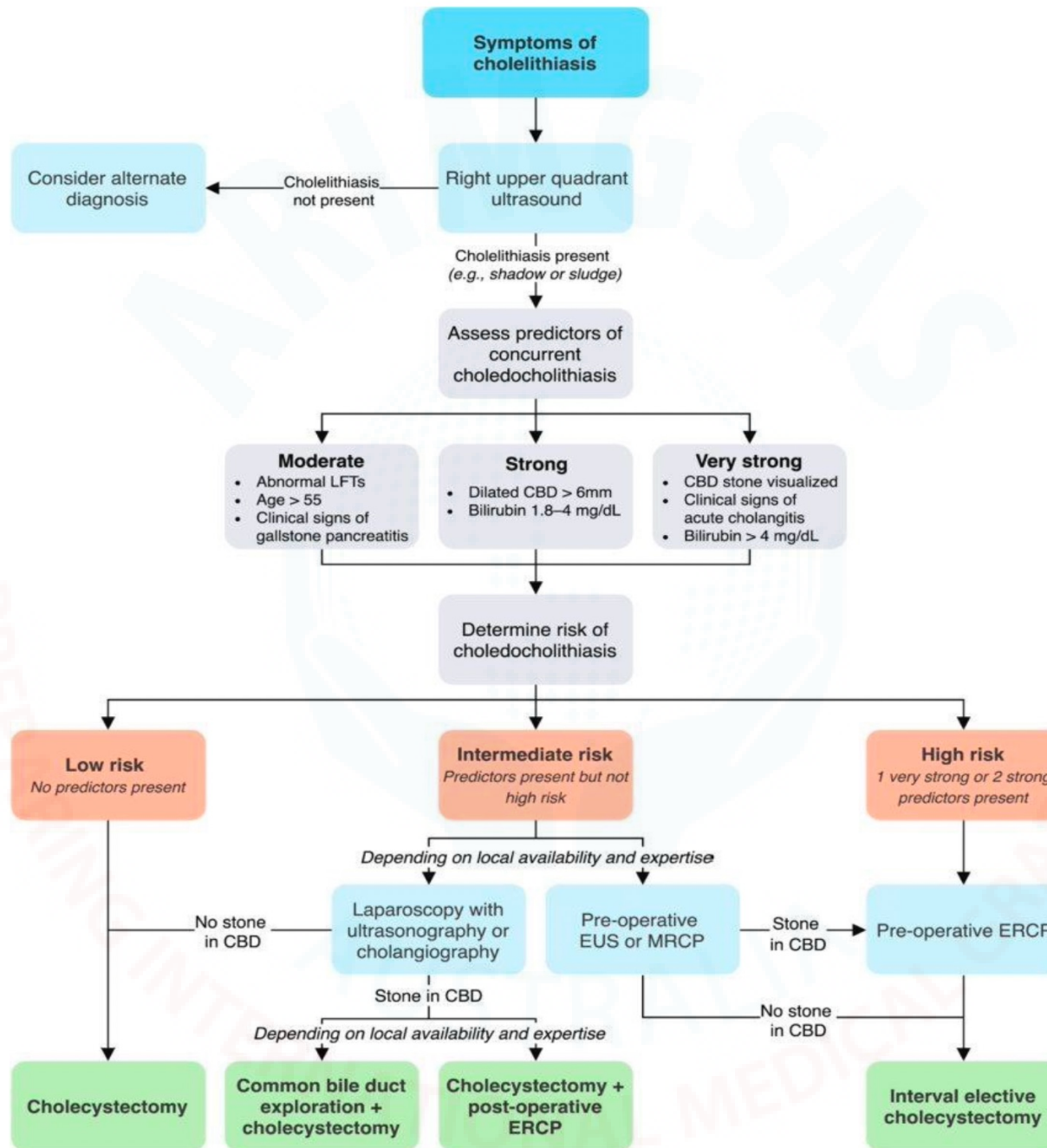
Definitive treatment is always Cholecystectomy- and this is elective.

Prophylactic Cholecystectomy:

>3cm stone size

Porcelain GB (calcification of GB wall)

Multiple stones



BILIARY COLIC

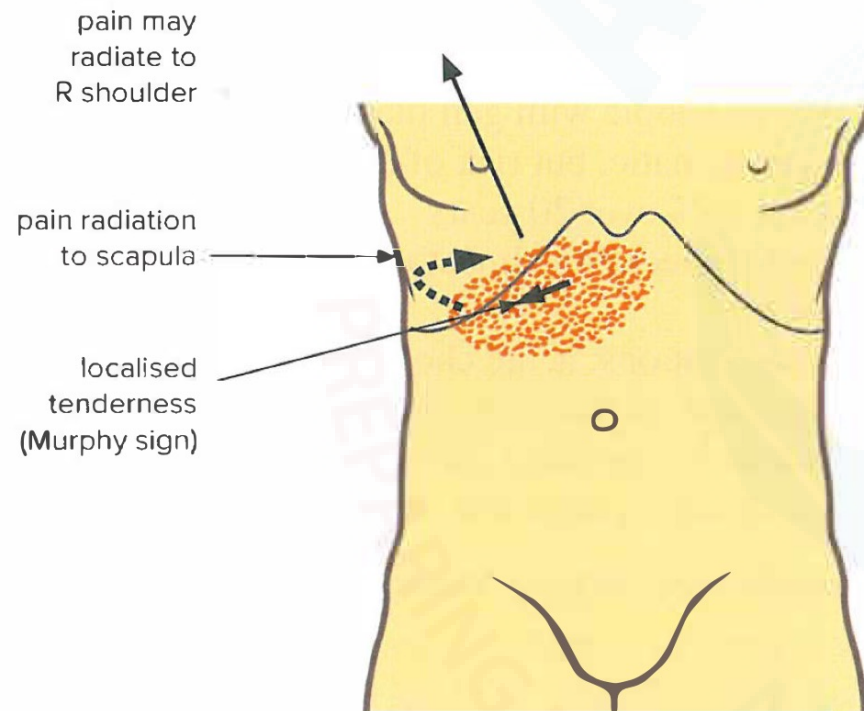


FIGURE 34.14 Typical site of pain of biliary colic and acute cholecystitis

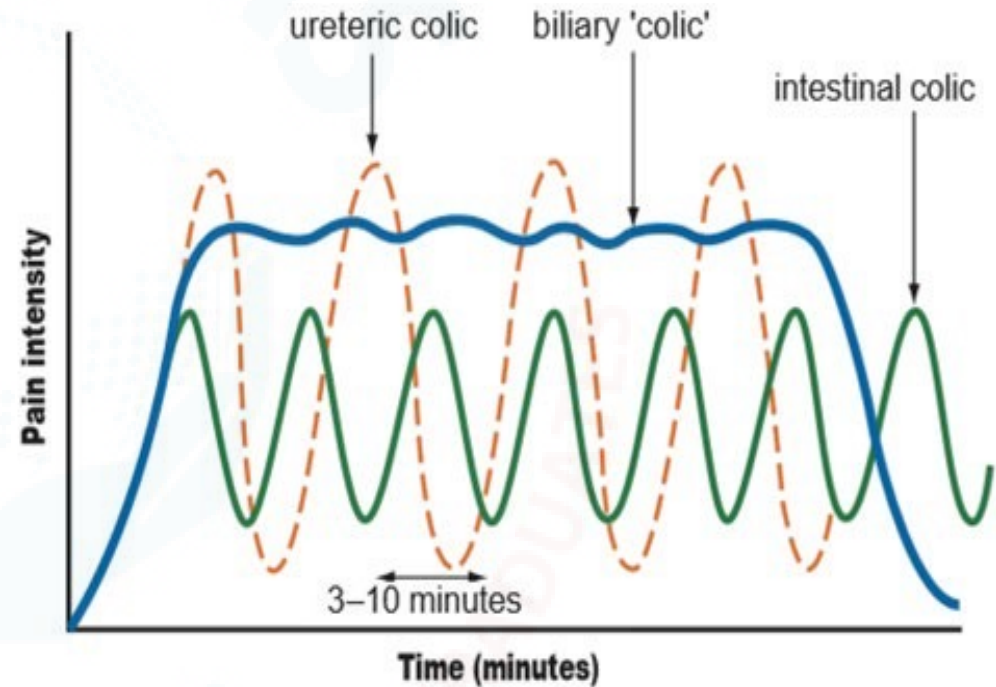
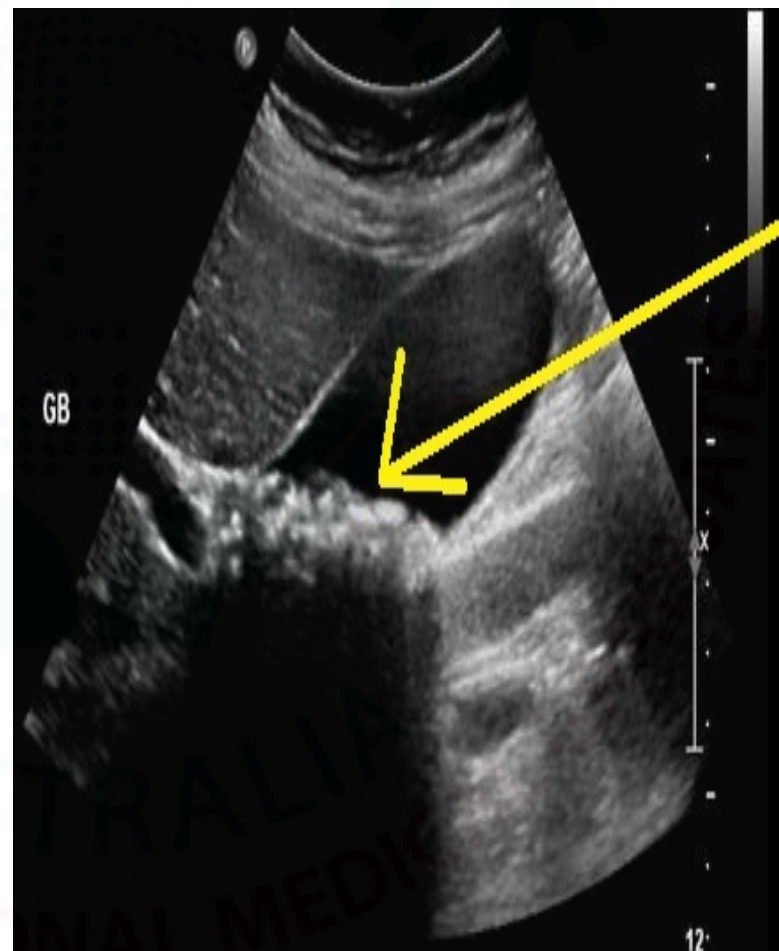


FIGURE 34.2 Characteristic pain patterns for various causes of 'colicky' acute abdominal pain



Gallstones noted near the neck of the gallbladder

You have just seen an asymptomatic lady with three small stones in her gallbladder. Which of the following statement is the best advice regarding the prognosis of asymptomatic gallstones?

- ☐ a. Patients with asymptomatic gallstones become symptomatic at a rate of about 2 percent per year
- ☐ b. Most common symptom when developed is less likely to be biliary colic
- ☐ c. Once biliary symptoms begin, they are less likely to recur
- ☐ d. About 40 to 50 percent of patients develop gallstone pancreatitis every year
- ☐ e. Right lower quadrant pain is most common site for pain

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- ☐ d. About 40 to 50 percent of patients develop gallstone pancreatitis every year
- ☐ e. Right lower quadrant pain is most common site for pain

A

A 47-year-old lady presents with an incidental finding of 2.5cm gallstone on abdominal ultrasound. She has no symptoms. What will be your best next step in her management?

- ☐ a. ERCP
- ☐ b. CT angiogram
- ☐ c. MRI
- ☐ d. Prophylactic cholecystectomy
- ☐ e. No further action needed

Correct Answer: e. No further action needed

Answer Detail:

The correct answer is e.

This patient has developed asymptomatic gallstones with size less than 3cm. She does not need any treatment at this stage.

Prophylactic cholecystectomy is warranted in asymptomatic patients with cholelithiasis only if they have large gallstones more than 3 cm or porcelain gallbladder. These conditions increase the risk of gallbladder carcinoma in future so these both must be treated.

The gallstones are best diagnosed with ultrasound and no other investigations needed at this stage.

ACUTE CHOLECYSTITIS

Acute inflammation of the gall bladder due to impaction of the calculus / obstruction in the cystic duct.

Clinical features :

1. Localized pain to the right hypochondrium
2. Nausea & vomiting
3. Fever & leukocytosis.
4. Pain aggravated by deep inspiration.
5. **Murphy's sign positive on examination.**

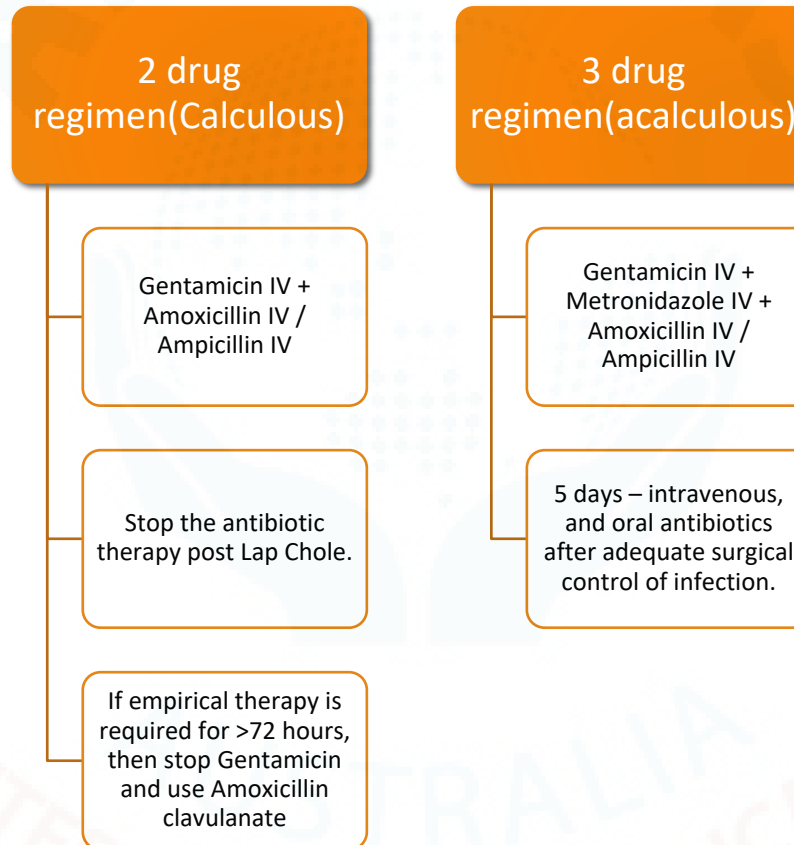
Jaundice is not seen in majority.

TYPES OF CHOLECYSTITIS

Acute calculous cholecystitis (90%) caused by Enterobacteriaceae: **Escherichia coli** and Klebsiella species and less commonly Enterococcus faecalis.

- **Acute acalculous cholecystitis 10%** is usually associated with a thickened or emphysematous gallbladder wall.
- It is more likely to occur in patients who are critically ill, immunocompromised or those with diabetes.

EMPERICAL ANTIBIOTICS



INVESTIGATIONS AND MANAGEMENT

INVESTIGATIONS:

- **1st**- USG
- **Next/Best**- HIDA scan (Hepatobiliary Iminodiacetic Acid scan)
- A radioactive tracer is injected IV → taken up by hepatocytes → excreted into bile → visualised as it flows through biliary tree into gallbladder and intestine.

MANAGEMENT:

- Medical- NPO— IV fluids— Antibiotics
- Need cholecystectomy.

A 42-year-old lady presented with an incidental finding of calcified gallbladder on abdominal ultrasound. She has mild dyspepsia and no other symptoms. What will be the best next step in her management?

- ☐ a. ERCP
- ☐ b. No further action needed
- ☐ c. Prophylactic cholecystectomy
- ☐ d. MRI
- ☐ e. CT angiogram

A 42-year-old lady presented with an incidental finding of calcified gallbladder on abdominal ultrasound. She has mild dyspepsia and no other symptoms. What will be the best next step in her management?

- ☐ a. ERCP
- ☐ b. No further action needed
- ☐ c. Prophylactic cholecystectomy
- ☐ d. MRI
- ☐ e. CT angiogram

ERCP – indicated in CBD stone, Cholangitis.

Procelain GB has increased risk of developing GB carcinoma.

MRI - diagnosis already made

CT angio – Not routinely performed for GB

C

A 40-year-old woman presents with colicky pain in right upper quadrant and epigastrium. The pain is associated with diaphoresis, nausea, and vomiting. It is not exacerbated by movement and is not relieved by squatting, bowel movements or passage of flatus. What is the first investigation in this case?

1. Abdominal USG
2. CT scan
3. MRI
4. Plain X-ray
5. ERCP

A 40-year-old woman presents with **colicky pain in right upper quadrant and epigastrium**. The pain is associated with diaphoresis, nausea, and vomiting. It is not exacerbated by movement and is not relieved by squatting, bowel movements or passage of flatus. What is the first investigation in this case?

1. Abdominal USG (biliary colic due to GB stone)
2. CT scan
3. MRI
4. Plain X-ray
5. ERCP (Cholangitis, Obstructive jaundice, Choledocholithiasis)

Your next patient is a known case of MI last month placed on aspirin and Clopidogrel, who comes to see you with acute RUQ pain. You have diagnosed him based on ultrasonography as having cholecystitis with stones in the GB. However, he is still unresponsive to IV antibiotics despite continuous administration for five days.

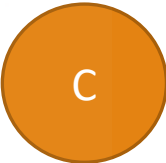
What would you do next?

- A. Call the radiologist to redo the ultrasound
- B. Change antibiotics
- C. Percutaneous cholecystostomy
- D. ERCP and extraction
- E. Surgery

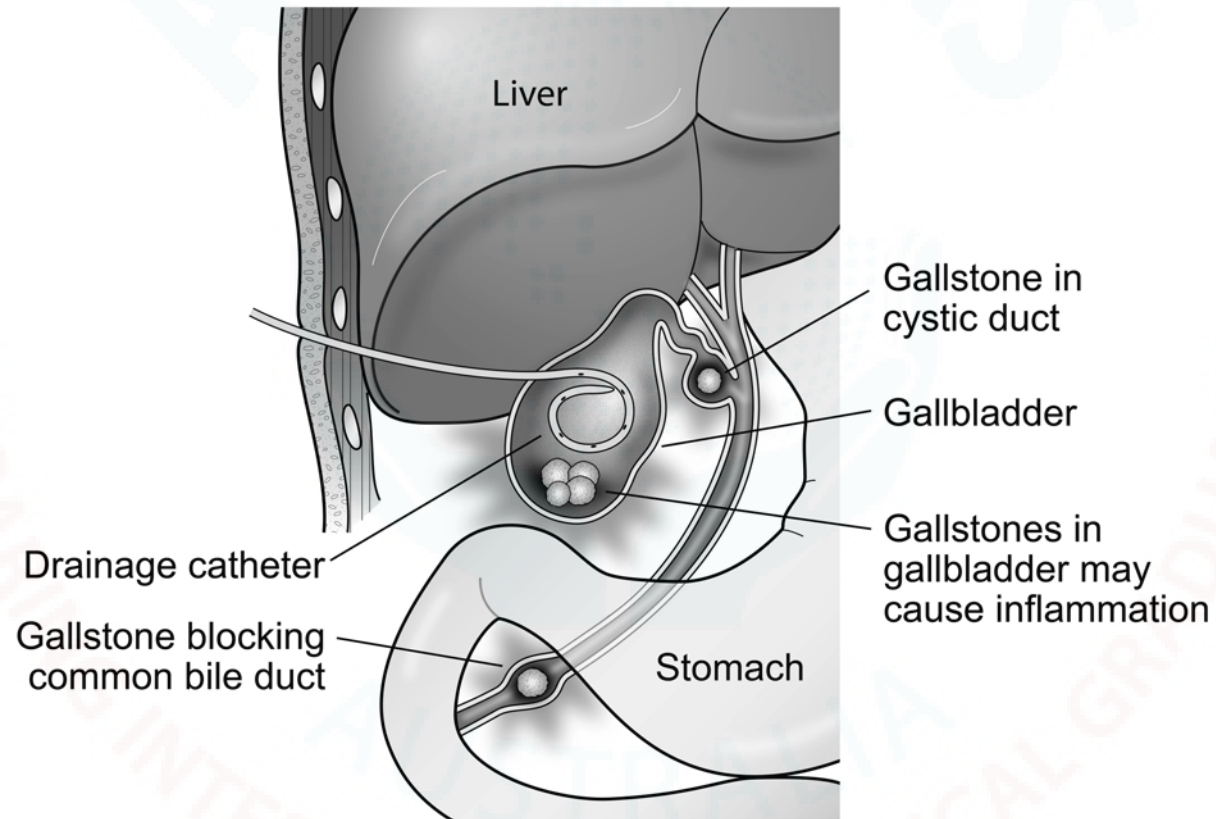
Your next patient is a known case of **MI last month** placed on **aspirin and Clopidogrel**, who comes to see you with acute RUQ pain. You have diagnosed him based on ultrasonography as having cholecystitis with stones in the GB. However, he is still unresponsive to IV antibiotics despite continuous administration for five days.

What would you do next?

- A. Call the radiologist to redo the ultrasound
- B. Change antibiotics
- C. Percutaneous cholecystostomy (**Pt. is unstable and high anesthetic risk** and if he was stable – we would have gone with laparoscopic cholecystectomy)
- D. ERCP and extraction Surgery

C

PERCUTANEOUS DRAIN



Which of the following is the most common gastrointestinal complication seen after cholecystectomy?

- ☐ a. Dyspepsia
- ☐ b. Diarrhoea
- ☐ c. Malnutrition
- ☐ d. Vitamin D deficiency
- ☐ e. Folic acid deficiency

Correct Answer: b. Diarrhoea

Answer Detail:

The correct answer is b.

Many patients develop diarrhoea post-cholecystectomy often because bile salt are directly flowing to the ilium and they are released continuously.

Cholecystectomy effectively prevents future biliary colic but is less effective for preventing atypical symptoms such as dyspepsia.

Cholecystectomy does not result in nutritional problems or a need for dietary limitations. Vitamin D and folic acid deficiencies are very rare after cholecystectomy.

POST CHOLECYSTECTOMY SYNDROME

Presents as persistent RUQ pain after removal of the gallbladder.

Seen in 10 – 15% of the patients

It is usually due to the following causes :

- Choledocholithiasis

- Biliary stricture

- Pancreatitis / Pancreatic pseudocyst formation

- Elevated sphincter of Oddi dysfunction – which can be checked using manometry (Manometry measures the pressure generated by sphincters or smooth muscle to assess motility disorders – High pressure) during ERCP procedure.

POST CHOLESYSTECTOMY SYNDROME

Table 1. Timing of recurrent pain with possible diagnoses and useful investigations

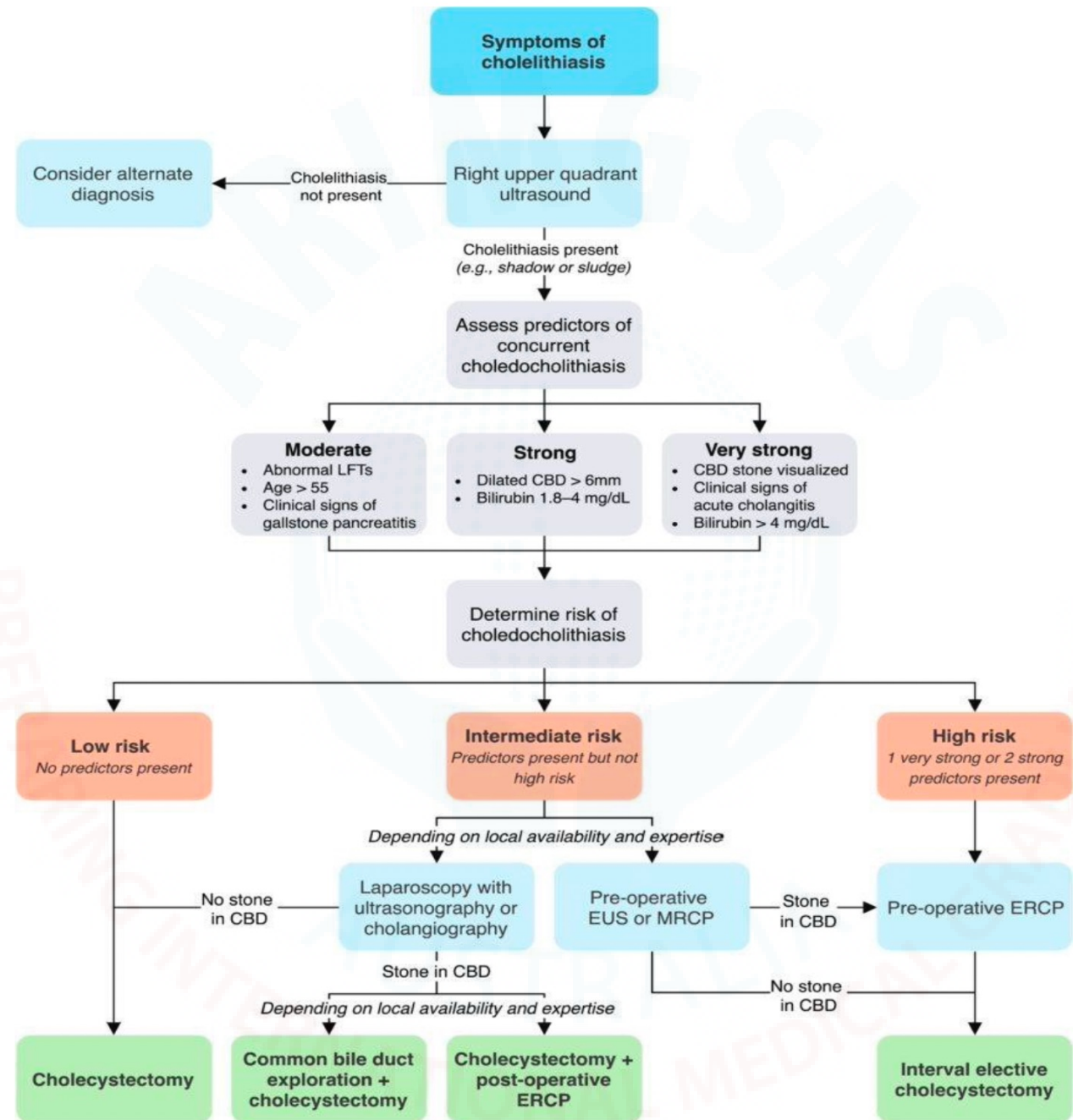
Early (within 1–2 weeks of surgery)	• Retained common bile duct stone • Bile leak • Postoperative infection	• Ultrasound • Liver function tests • Surgical review
Late	• Retained stone • Peptic ulcer disease • Colonic pathology • Biliary dyskinesia (spasm of the sphincter of Oddi)	• Ultrasound • Liver function tests • Surgical, gastroenterologist review • CT scan, magnetic resonance cholangiopancreatography • Upper and lower gastrointestinal endoscopy

CHOLEDOCHOLITHIASIS

- This is due to stone present in the CBD.
- The bile that is secreted cannot drain into the intestine.
- Patient presents with – RUQ pain / Obstructive Jaundice

INVESTIGATIONS AND MANAGEMENT:

- Cholecystectomy
- ERCP



CHOLANGITIS

Acute cholangitis (ascending cholangitis) refers to a bacterial infection of the biliary tract, typically secondary to biliary obstruction and stasis (e.g., due to choledocholithiasis, biliary stricture).

SYMPTOMS:

Charcots triad:

1. RUQ pain
2. Jaundice
3. Fever

Reynolds Pentad:

1. Shock (hypotension)
2. Altered mental status
3. RUQ pain +Jaundice+Fever (Charcots triad)

POOR PROGNOSTIC FACTORS

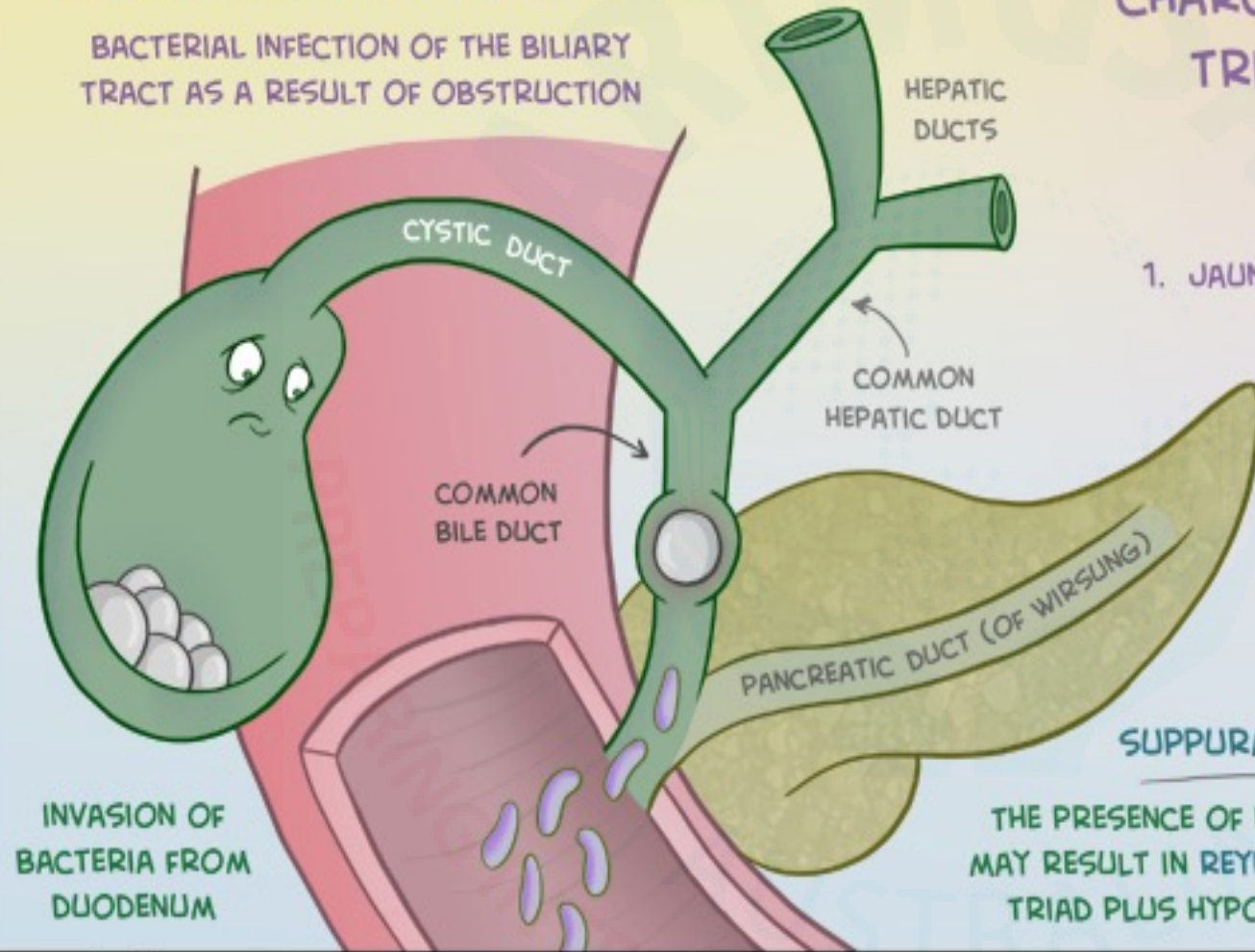
- Age > 70 years
- Female gender
- Liver abscess
- Any concomitant illness / hypoalbuminemia / Inflammatory bowel disease / Low platelets
- Failure to respond to conservative treatment
- Hypotension

MANAGEMENT

- Blood samples need to be sent for culture and sensitivity before starting antibiotic therapy.
- For empirical therapy – two drug regimen is followed.
 - Gentamicin IV + Amoxicillin / Ampicillin IV
- For patients with chronic biliary obstruction add Metronidazole.
- Urgent ERCP is essential in this case to relieve the biliary obstruction.
- Once the patient stabilises can proceed to cholecystectomy.

ACUTE CHOLANGITIS

BACTERIAL INFECTION OF THE BILIARY TRACT AS A RESULT OF OBSTRUCTION



CHARCOT'S TRIAD

1. JAUNDICE

YOU'RE SO HOT.

3. FEVER

2. RUQ PAIN

ACUTE SUPPURATIVE CHOLANGITIS

THE PRESENCE OF PUS IN THE BILIARY DUCTS MAY RESULT IN REYNOLD'S PENTAD: CHARCOT'S TRIAD PLUS HYPOTENSION AND CONFUSION



A 42-year-old lady presented with abdominal pain, mild jaundice and fever. She was admitted to the ward. Now she started having rigors and chills associated with nausea and vomiting and is hypotensive.

What is the most likely diagnosis?

- ☐ a. Septic shock
- ☐ b. Acute cholangitis
- ☐ c. Acute cholecystitis
- ☐ d. Acute pancreatitis
- ☐ e. Choledocholithiasis

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- ☐ a. Septic shock
- ☐ b. Acute cholangitis
- ☐ c. Acute cholecystitis
- ☐ d. Acute pancreatitis
- ☐ e. Choledocholithiasis

Septic shock – is a complication or the stage patient is in but not a primary diagnosis.
Choledocholithiasis – can cause obstruction but not infection.

B

A 58-year-old female presents to emergency with severe abdominal pain and jaundice which has developed over the last 48-hours. She has no significant past medical history. On examination, the patient is jaundiced, with right upper quadrant tenderness on abdominal palpation. Vital signs are as follows: BP: 105/62, Pulse: 112, Respiratory rate: 16, SpO2: 98% on air, Temperature: 38.2 C. Which of the following is the most likely diagnosis?

1. Cholangitis
2. Cholecystitis
3. Alcoholic hepatitis
4. Pancreatitis
5. Gastritis

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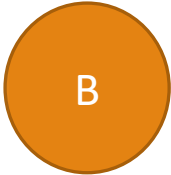
1. Cholangitis
2. Cholecystitis
3. Alcoholic hepatitis
4. Pancreatitis
5. Gastritis

A 39-year-old female comes to your surgery outpatient department with a history of swinging fever with chills and rigors. She also claimed having dark urine for the last four days. on general examination she looks jaundiced. her temperature reads 39.4°C. What management plan other than antibiotics will help?

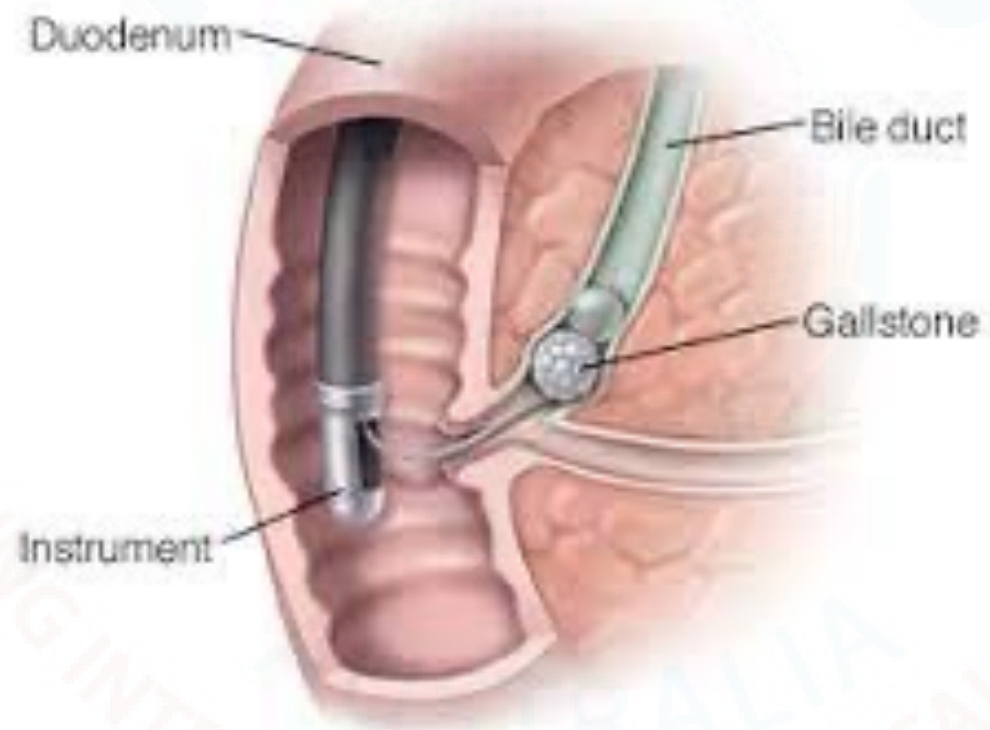
- A. Laparotomy
- B. ERCP
- C. MRCP
- D. HIDA
- E. Massaging the patient head

A 39-year-old female comes to your surgery outpatient department with a history of swinging fever with chills and rigors. She also claimed having dark urine for the last four days. on general examination she looks jaundiced. her temperature reads 39.4°C. What management plan other than antibiotics will help?

- A. Laparotomy (not 1st line : only if ERCP fails)
- B. ERCP (diagnostic + therapeutic)
- C. MRCP (diagnostic only)
- D. HIDA(only used for cholecystitis evaluation)
- E. Massaging the patient head

B

ERCP



LIVER ABCESS

A liver abscess is defined as a pus-filled mass in the liver that can develop from injury to the liver or an intraabdominal infection disseminated from the portal circulation.

The majority of these abscesses are categorized into pyogenic or amoebic, although a minority is caused by parasites and fungi.

The most common organisms include *E.coli*, *Klebsiella*, *Streptococcus*, *Staphylococcus*, and anaerobic organisms but are generally polymicrobial.

CLINICAL FEATURES

1. Fever&chills
2. Night sweats
3. Malaise
4. Nausea or vomiting,
5. Right shoulder pain (due to phrenic nerve irritation),
6. Right upper quadrant pain

ON EXAMINATION:

1. Hepatomegaly
2. Jaundice

INVESTIGATIONS AND MANAGEMENT

FIRST TEST: USG

BEST TEST: CT

MANAGEMENT:

Amoebic Liver Abscess- Metronidazole

Hydatid Cyst – Albendazole + Surgical Excision

Needle Drainage(<5cms, single cyst)- for other causes of liver cysts.

High fever + toxic patient → think amoebic abscess

Well patient + incidental cyst → think hydatid

RIGHT LOWER QUADRANT APPENDICITIS

Most common medical emergency

Max incidence is between 20 – 30 years of age

Initial pain is central abdominal in location of increasing severity and then shifts to RIF in around 6 hours.

Characterized by sudden anorexia, vomiting, nausea +/- diarrhoea & constipation.

M/C position of the appendix is retrocaecal---->Pelvic---->Preileal

In pregnancy there is an increased incidence in 1&2 trimester whereas there is an increased risk of perforation in the 3rd trimester.

EXAMINATION

Psoas sign : Pain on resisted flexion of right leg, on hip extension or on elevating right leg (due to irritation of psoas especially with retrocaecal appendix)

Obturator sign : Pain on flexing patient's right thigh at the hip with the knee bent and then internally rotating the hip (due to irritation of internal obturator muscle)

Rovsing sign : Rebound tenderness in RIF while palpating in the LIF.

Rigidity and rebound tenderness present

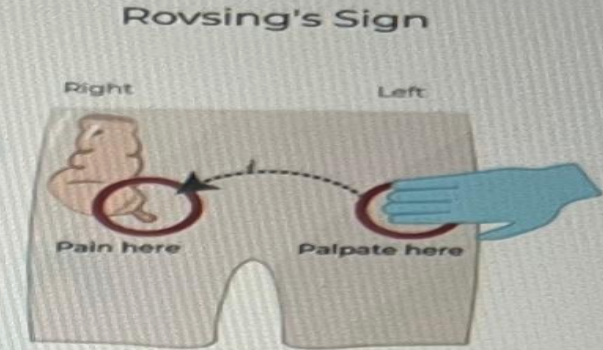
Guarding may be seen in case of perforation of the appendix leading to peritonitis

SIGNS OF ACUTE APPENDICITIS

@medico_with_a_chai

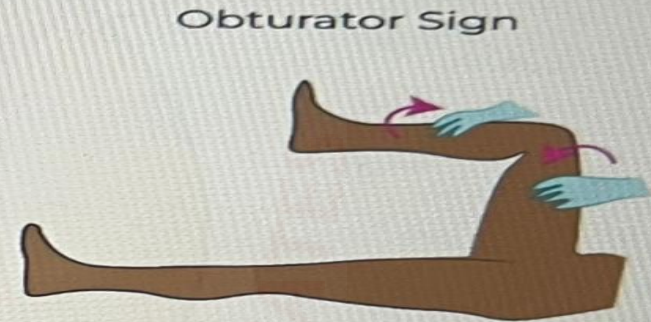
ROVSING'S SIGN

- MOST CHARACTERISTIC SIGN
- PAIN IN RIGHT ILIAC FOSSA WHILE PRESSING LEFT ILIAC FOSSA



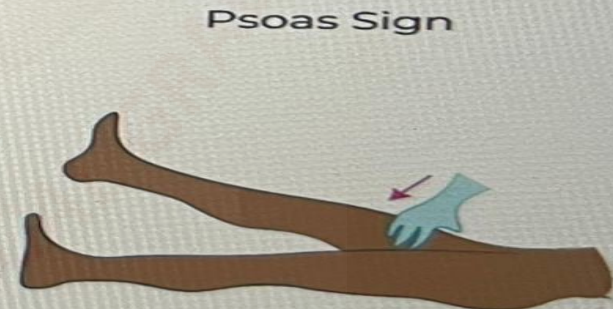
OBTURATOR SIGN

- PAIN ON INTERNAL ROTATION OF RIGHT THIGH OVER HIP JOINT
- POSITIVE IN PELVIC APPENDICITIS



PSOAS SIGN

- HYPEREXTENSION OF THE RIGHT HIP JOINT CAUSES PAIN IN THE RIGHT ILIAC FOSSA
- POSITIVE IN RETROCECAL APPENDICITIS



If appendix is

Retrocaecal :

- No rebound tenderness
- Psoas sign is positive
- Rovsing sign is negative

Pelvic

- Tenderness on per rectal exam
- Obturator sign is positive

SCORING SYSTEM

MANTRELS Scoring System

Characteristic	Points
Migration of pain to right lower quadrant	1
Anorexia	1
Nausea and vomiting	1
Tenderness in right lower quadrant	2
Rebound pain	1
Elevated temperature	1
Leukocytosis	2
Shift of white blood cell count to left	1
Total	10

Recommendations:

Score < 5	<i>Appendicitis unlikely</i>
Score 5 or 6	<i>Appendicitis possible</i>
Score 7 or 8	<i>Appendicitis likely</i>
Score 9 or 10	<i>Appendicitis highly likely</i>

Source: Alvarado A. A practical score for the early diagnosis of acute appendicitis. *Ann Emerg Med.* 1986;15:557-564.

INVESTIGATIONS

- Baseline vital signs: a low-grade fever may be present
- Urinalysis: to rule out urinary tract infection
- Capillary blood glucose: nausea, vomiting and anorexia may have cause hypoglycemia.
- Full blood count: raised white cell count
- Urea & electrolytes: anorexia, nausea and vomiting may cause deranged renal function in severe cases
- CRP: suggestive of inflammation
- **The accepted first-line imaging for appendicitis is ultrasound**, followed by cross-sectional imaging in the form of CT or MRI scanning.

MANAGEMENT

- Bed rest
- IV fluids
- Nil per oral
- Nasogastric tube if vomiting
- Analgesia IV
- Antibiotics IV
- Laparoscopic Appendicectomy
- If complicated (eg rupture) then go for an open surgery.

ANTIBIOTICS

Three drug regimen :

Gentamicin IV + Metronidazole IV + Amoxicillin IV / Ampicillin IV

If uncomplicated stop them after surgery.

If complicated (perforation / abscess) = 5 days – intravenous, and oral antibiotics after adequate surgical control of infection.

MECKELS DIVERTICULUM

- Acute Meckel diverticulitis is characterized by abdominal pain and tenderness typically localized below or adjacent to the umbilicus
- It is often accompanied by vomiting and mimicking appendicitis.
- Patient's may present with repeated episodes of painless, bright red rectal bleeding, which is usually not severe enough to cause shock.
- Usually follows the rule of 2
 - 2 inches long
 - 2 feet proximal to illoceacal valve
 - 2% of the general population are affected

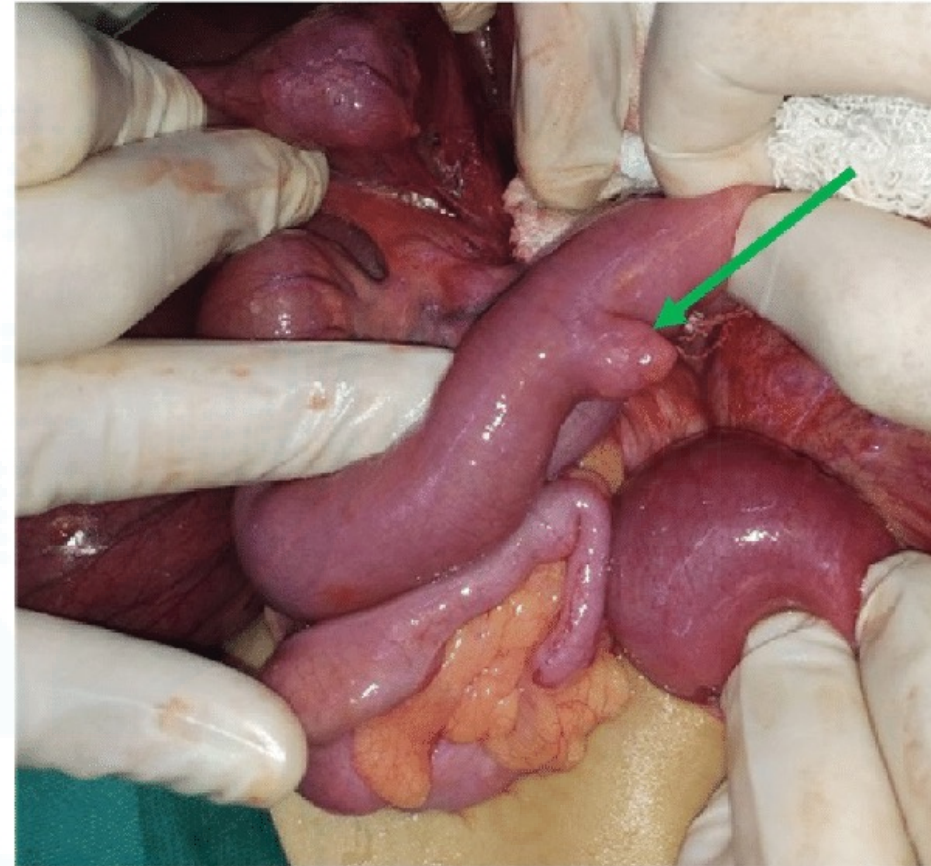
Meckel diverticulum is a common congenital abnormality of the small intestine caused by incomplete obliteration of the vitelline (omphalomesenteric) duct.

It is a true diverticulum, typically located on anti-mesenteric border of ileum, and contains all three coats of intestinal wall (Mucosa, Sub mucosa, Muscularis Propria) with its separate blood supply from the vitelline artery.

Mx-

Asymptomatic – NO treatment

Symptomatic – Surgical removal
(Diverculectomy)



MESENTRIC ADENITIS

Inflammation of LN in mesentery (esp. RL abdomen)

Very similar to Appendicitis & commonly presents in children and young adults.

Localization of pain is very difficult

Features of anorexia / nausea / vomiting are comparatively lesser when compared to Appendicitis.

FEATURES- Fever + lymphadenopathy

Usually triggering factors will be viral or bacterial infections previously.

Illness lasts for 5 days usually

INV – CT scan

Management : simple analgesia and Hydration.

RLQ pain (mild) + recent sore throat / viral illness + child + normal appendix on scan → Mesenteric adenitis

Migrating pain (McBurneys point)+ vomiting + rebound tenderness → Appendicitis

MIDLINE PAIN PANCREATITIS

CAUSES:

Gall stones- m/c in acute

Ethanol- m/c in chronic

Trauma

Steroids

Mumps / Malignancy

Autoimmune

Scorpion sting / Spider bites

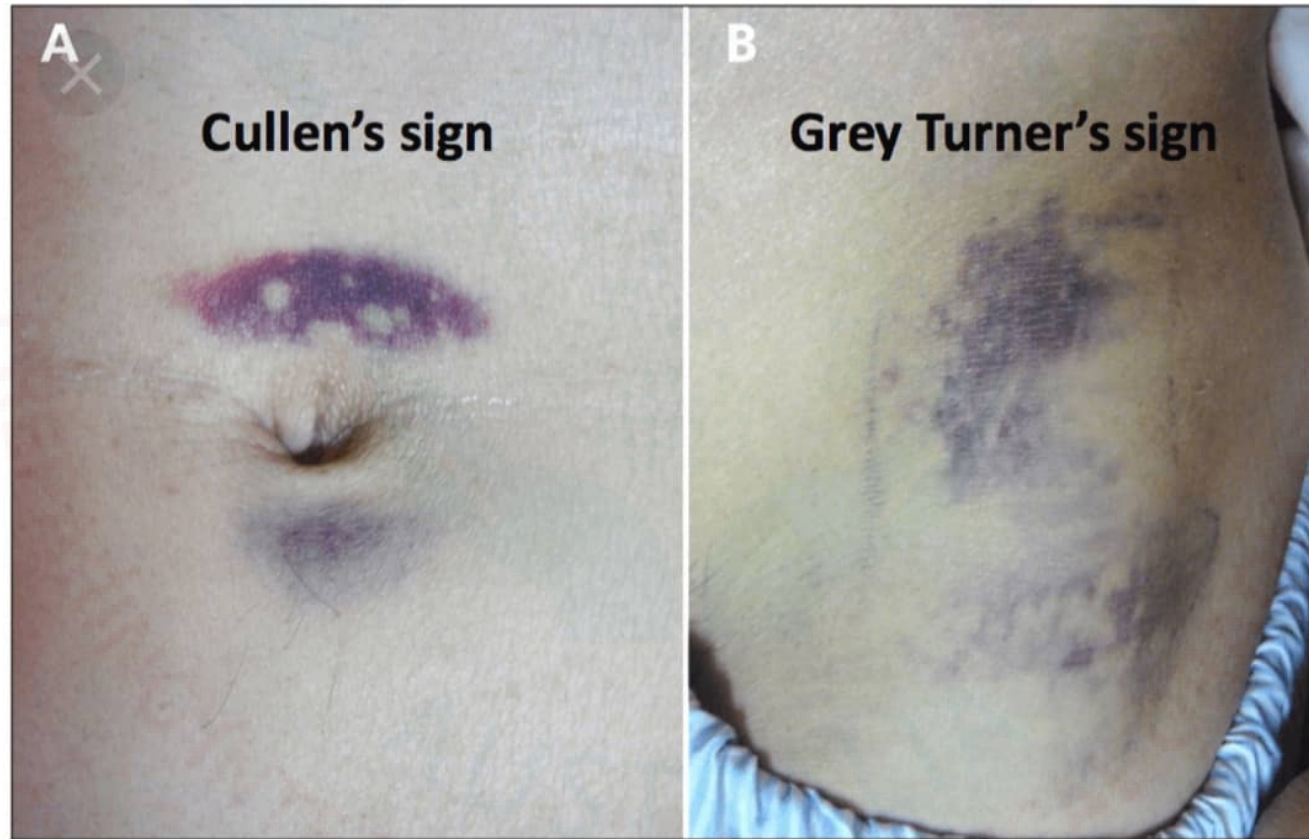
Hyperlipidaemia

ERCP

Drugs

CLINICAL FEATURES

- Constant severe epigastric pain radiating towards the back. It is usually relieved on leaning forward.
- History of Alcohol intake / Binge drinking
- Pain is worse after the meals
- Nausea / vomiting
- Fever (mild to moderate)
- *Usually there is no rigidity / guarding / rebound tenderness
- If there is severe intraabdominal and retroperitoneal Hemorrhage , then Cullen's and grey turner's signs are seen (intraperitoneal or retroperitoneal hemorrhage)



BASIC INVESTIGATIONS

FIRST STEP :

1. Lipase – increases 3 times the normal (more specific than amylase to pancreatitis) – **(10-60U/L)**
2. Amylase – 3 times normal- it can be elevated in other conditions as well. Hence not used in assessing severity. **(30-100U/L)**
3. If both amylase and lipase are given in options- choose lipase.

BEST TEST- CT

In addition,

CRP – increased

CBG – elevated (decrease insulin – increased blood glucose)

FBC – Anaemia / increased WBC count

LFT – can be checked if there is obstructive jaundice features

ABG – to check PaO₂ levels

IMAGING

Acute pancreatitis – in terms of imaging- **1st investigation is USG Abdomen**

Best Imaging is CT- can give you the amount of necrosis and >30% necrosis indicates infection

.

ERCP – is used only if associated with cholangitis causing obstruction.

Chronic pancreatitis – CT scan is the investigation of choice. If not available, then we can go for USG Abdomen

ASSESSING SEVERITY

“PANCREAS” – any 3 of these detected within 48 hours, suggest severe pancreatitis and patient should be shifted to an ICU / HDU setup.

Pao₂ < 60 mmHg

Age > 55 years

Neutrophilia (WBC > 15)

Ca²⁺ < 2 mmol/L

Renal function (urea > 16 mmol/L)

Enzymes (LDH > 600 IU/L or AST > 100 IU/L or ALT > 100 IU/L)

Albumin < 32g/L

Sugar (BSL > 10 mmol/L)

MANAGEMENT

Admit to the hospital

Bed rest

Nil per oral

NG tube placement if vomiting

IV fluids – normal saline

Analgesics – Morphine / Fentanyl

Antiemetics – Ondansetron / metoclopramide

We can start oral feeding as soon as tolerated. (usually within 24 – 48 hours)

Treat the underlying cause if present.

Can go for a surgical intervention in cases of gall stone or infected pseudocyst or if associated infection

ANTIBIOTICS

Used only if infected pancreatic necrosis or abscess formation takes place.

Percutaneous drainage or open surgical debridement can be done

Always collect an aspirate for culture and then start antibiotics.

Empirical antibiotics :

Piperacillin + Tazobactam IV – initially for 7 days

PANCREATIC PSEUDOCYST

Complication of pancreatitis

A **pancreatic pseudocyst** is a **localized collection of pancreatic fluid rich in enzymes, blood, and necrotic debris** that is surrounded by a **wall of granulation and fibrous tissue**.

CLINICAL FEATURES:

- Mass abdomen
- Early satiety (feeling full sooner than normal)
- H/o acute pancreatitis 4-6 weeks ago.

INVESTIGATION – CT Scan

Rule of 6

> 6 cm / > 6 weeks => Operate and drainage

Also consider drainage if compressive features present- large vessel compression (portal vein), CBD compression or if complications such as haemorrhage or fistula formation seen.

Endoscopic cystogastrostomy (preferred) - minimally invasive procedure used to drain a pancreatic pseudocyst into the stomach (communication between posterior wall of stomach and cyst).

percutaneous drainage (preferred if infected pseudocyst) can be done.

CHRONIC PANCREATITIS

M/C etiology is alcohol. Could also be due to gall stones.

CLINICAL FEATURES:

- Chronic epigastric pain radiating to the back
- Steatorrhea
- Unexplained weight loss
- DM
- Other Exocrine and endocrine function deficiencies (Eg ; protein & carbohydrate maldigestion, Vit. ADEK deficiency).

CHRONIC PANCREATITIS

INVESTIGATIONS:

- CT
 - Can do EUS
 - **Fecal elastase-1**(elastase are produced by pancreas) for exocrine function insufficiency.
-

TREATMENT:

- Pain management
- Stop Alcohol
- Replace the enzymes – Pancrelipase (Lipase, Amylase, Protease)
- Correct DM
- Endoscopic duct stenting – (to relieve duct obstruction & reduce pain)
- Surgery – Puestow procedure(lateral pancreaticojejunostomy) – longitudinal duct opened & drained into jejunum (only when medical tt & endoscopic duct stenting fails)

PANCREATIC CANCER

Pancreatic Cancer Risk Factors

Smoking (20% of pancreatic cancers are caused by smoking)

Age older than 55 years old

Diabetes

Obesity

Chronic pancreatitis

Work exposure to chemicals in the dry cleaning and metalworking industry

Males more than females

African Americans more than whites

Family history

CLINICAL FEATURES

Courvoisier's law: Painless jaundice+ palpable gall bladder is cancer until proven otherwise.

Weakness

Abdominal pain/ back pain

Anorexia

Pale stools, dark urine, pruritis

Palpable, hard, fixed mass

Newly developed DM

INVESTIGATIONS AND MANAGEMENT

First Step- CT

Management: Surgical resection

Follow up- Monitor CA19-9

MESENTERIC ISCHEMIA

It is usually due to the **occlusion of the SMA**.

Clinical Features:

AMI patients typically present with abdominal pain that does not correlate with physical exam findings.

Tenderness to palpation occurs when the entire bowel wall is involved, which is a later presentation when necrosis begins to occur.

Patients with an embolic disease typically have a history of the bowel emptying violently, followed by severe pain. The syndrome rapidly advances to ischemia and necrosis because collateral blood flow is limited.

Thrombosis may take days or weeks to progress, with abdominal pain gradually worsening. Patients also may have a combination of diarrhea, distention, bloody stool, and most importantly, a history of postprandial pain, suggesting chronic mesenteric ischemia

Patient may have history of MI/AF.

INVESTIGATIONS AND MANAGEMENT

Intense abdominal pain+vomiting+diarrhoea with flecks of blood – think of AMI

It is usually a clinical diagnosis but can do – CT ANGIO

Treatment- Surgery for resection of the necrosed bowel and to restore circulation.

Usually in the exam- the stem of recent MI or a history of AF is given.

LEFT LOWER QUADRANT DIVERTICULAR DISEASE

Diverticula are outpouches of the colonic mucosa.

It is commonly seen on the left- sigmoid and the descending colon

Right sided diverticula are seen more commonly in the young asian population.

The presence of diverticula is called diverticulosis and is usually asymptomatic.

If it gets inflamed or infected it is called diverticulitis. It can lead to complications such as perforation, abscess formation, peritonitis and fistula formation.

Diverticular bleed is the M/C cause of massive lower GI bleed.

Patients with diverticular disease are encouraged to have a high fiber diet and increase fluid intake.

DIVERTICULOSIS AND DIVERTICULITIS

DIVERTICULOSIS SYMPTOMS:

- Painless massive lower GI bleed
- Some can have localized left sided abdominal pain
- Constipation and bloating

DIVERTICULOSIS INVESTIGATION :

Most accurate in Barium enema

DIVERTICULITIS SYMPTOMS:

- Pain – left illiac fossa
- Altered bowel Habits (diarrhoea/constipation)
- Massive lower GI bleed
- Fever, Leukocytosis

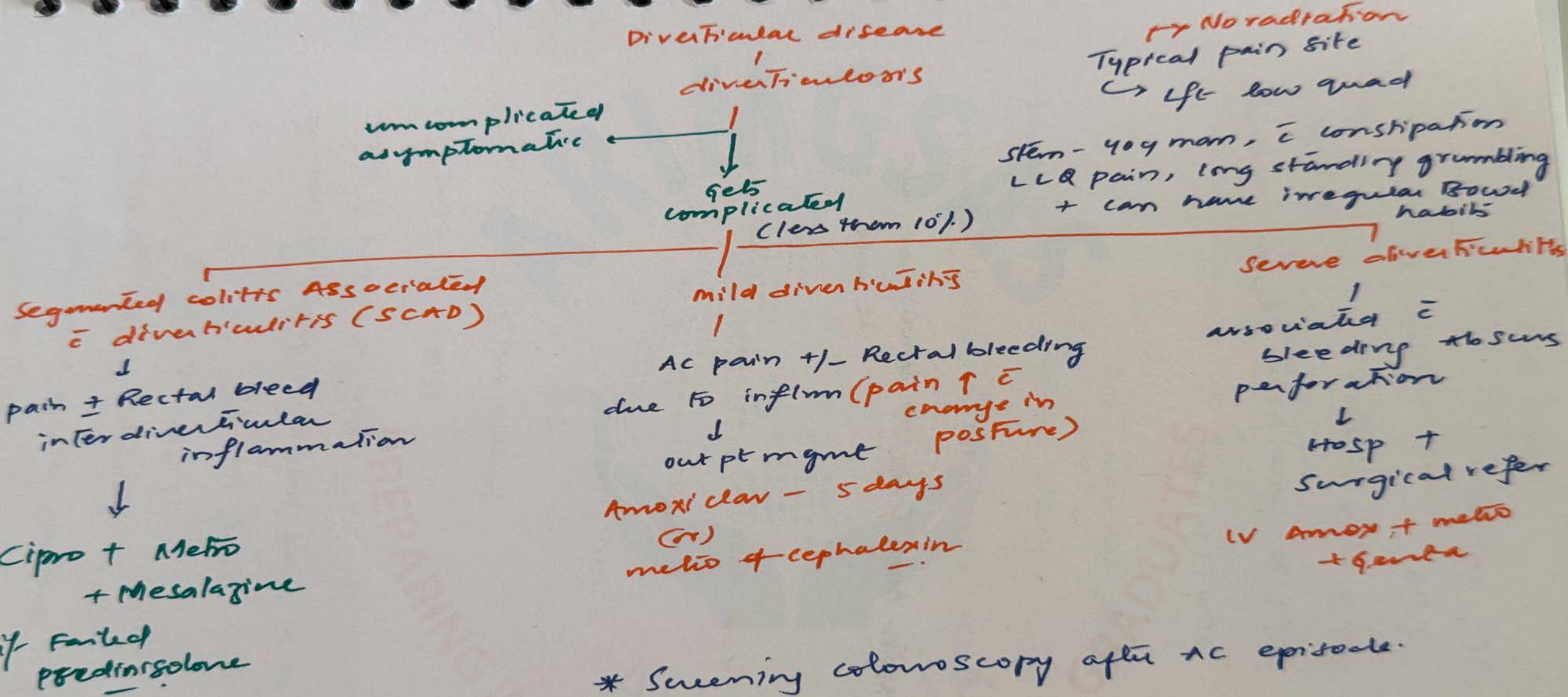
INVESTIGATION

Contrast enhanced CT

Colonoscopy can be done 6 weeks later.

TYPES:

- Diverticulitis can be stratified as uncomplicated or complicated on the basis of whether complications such as fistula, perforation, obstruction or massive diverticular bleeding are present.
- In uncomplicated diverticulitis, severe disease is differentiated from moderate disease by evidence of systemic infection, peritonitis, inability to tolerate oral intake or failure of outpatient management. Other signs of severe disease include persistent fever or leukocytosis, or worsening pain after two to three days.
- The mainstay of management for patients with uncomplicated severe diverticulitis includes bowel rest and broad-spectrum antibiotics



"Grumbling" refers to chronic, intermittent, low-grade symptoms due to ongoing mild inflammation.

PARALYTIC ILEUS AND PSEUDO OBSTRUCTION

Paralytic ileus and colonic pseudo-obstruction (Ogilvie's syndrome) cause functional obstruction, because of uncoordinated or attenuated intestinal muscle contractions.

Functional bowel obstruction is characterized by signs and symptoms of a mechanical obstruction of the small or large bowel in the absence of an anatomic lesion that obstructs the flow of intestinal contents.



PARALYTIC ILEUS

This is failure of transmission of a peristaltic wave.

Causes include:

Post op

Metabolic disturbances (Hypokalemia esp)

Sepsis

AKI

Trauma , peritonitis, ischemia

DKA

Drugs such as **opiates and anticholinergics**

CLINICAL FEATURES

Essentially it presents with features similar to a mechanical obstruction–

Abdominal distention

Nausea / vomiting

Constipation etc

However, on imaging there is air in the colon and rectum, and on CT abdomen there is no demonstrable mechanical obstruction.

MANAGEMENT

NPO

IV fluids

Correct any electrolyte imbalances if present

Reduce medications or if possible to stop, stop them.

PSEUDO OBSTRUCTION

Acute colonic pseudo-obstruction, or Ogilvie's syndrome, is a variant of ileus, characterized by massive colonic dilatation.

Chronic idiopathic pseudo-obstruction may be due to an underlying neuropathic disorder (involving the enteric nervous system or extrinsic nervous system) or a myopathic disorder (involving the smooth muscle).

SYMPTOMS

Similar to bowel obstruction.

IN EXAM, look for the precipitating cause for a clue.

INVESTIGATIONS AND MANAGEMENT

ERECT XRAY- FIRST STEP

Plain and upright abdominal radiographs show a dilated colon, often from the caecum to the splenic flexure, and occasionally to the rectum; haustral markings are normal

BEST- CT

TREATMENT

Treatment aims to relieve discomfort and prevent perforation or ischemia.

1. Treatment in the first instance is supportive care with removal of precipitants. Conservative therapy can be continued for 24 to 48 hours provided that there is no pain or extreme (>12 cm) colonic distension.

2.If conservative treatment fails, then the following options may be considered:

- Neostigmine and erythromycin have been reported as effective in the treatment of this condition.
- Decompression in patients with Ogilvie's syndrome may consist of endoscopic decompression with or without placement of a decompression tube, or percutaneous tube caecostomy.
- Surgery is rarely required. It is reserved for patients who fail medical and endoscopic management, and for those who develop signs of peritonitis or perforation.

TOXIC MEGACOLON

Toxic megacolon is a rare but potentially deadly complication of colonic inflammation.

Its definition is a non obstructive dilation of the colon, which can be total or segmental and is usually associated with systemic toxicity.

The diagnosis of toxic megacolon should be considered in all patients presenting with abdominal distension and acute or chronic diarrhoea .

CAUSES

Inflammatory Causes

Ulcerative colitis – MORE COMMON

Crohn disease

Infectious Causes

Clostridium difficile

Salmonella

Shigella

Campylobacter colitis

Enterohemorrhagic or enteroaggregative *Escherichia coli* O157 (can lead to hemolytic-uremic syndrome)

Cytomegalovirus

Entamoeba

INVESTIGATIONS

It is considered a clinical diagnosis

However, **Xray remains first step**

CT is the best step

In addition, stool samples must be sent for culture, along with blood samples.

DIAGNOSTIC CRITERIA

The criteria for the clinical diagnosis of toxic megacolon are:

Radiographic criteria:

- Dilated colon (>6cm, sometimes up to 15cm), commonly in the right or transverse colon but sometimes involving the descending colon
- Multiple air-fluid levels in the colon with disturbance of the colonic haustrae
- Deep mucosal ulcerations may appear as air-filled crevices between large **pseudopolypoidal projections extending into the colonic lumen**

PLUS at least three of the following:

- Fever >38°C
- Heart rate >120 beats/min
- Neutrophilic leukocytosis >10,500/microL
- Anaemia

PLUS at least one of the following:

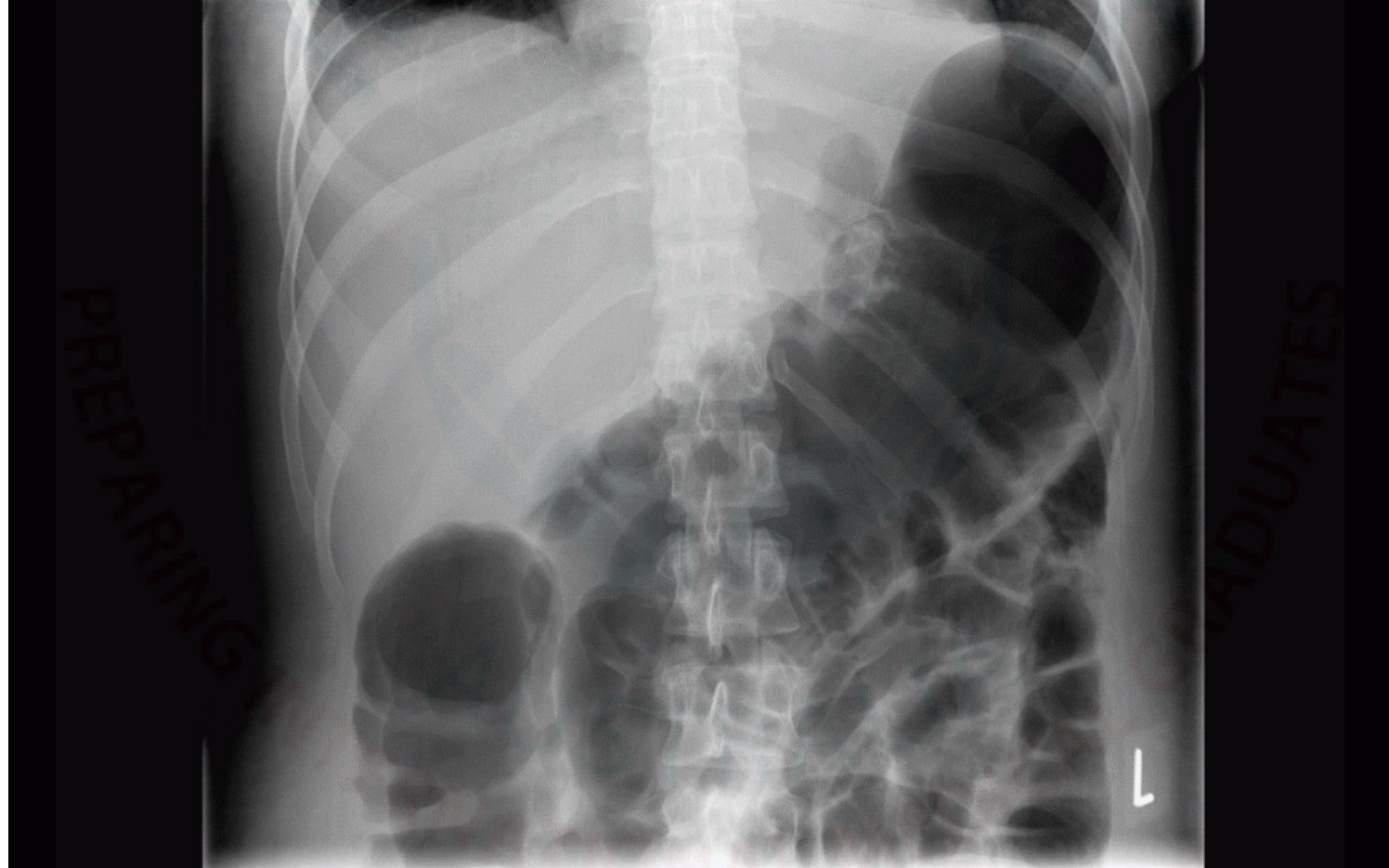
- Dehydration
- Altered sensorium
- Electrolyte disturbances
- Hypotension



MANAGEMENT

1. ABCD
2. Antibiotics, Analgesics, NG tube must be tried
3. If fails to respond to conservative management can proceed to surgical management- usually is **colonic resection**

XRAY - MEGACOLON



SIGMOID VOLVULOUS

Sigmoid volvulus is the most common type of colonic volvulus and occurs when a portion of the intestine twists around its blood supply. In sigmoid volvulus, this occurs at the base of the mesentery.

Seen commonly in the elderly with chronic use of laxatives/ constipation

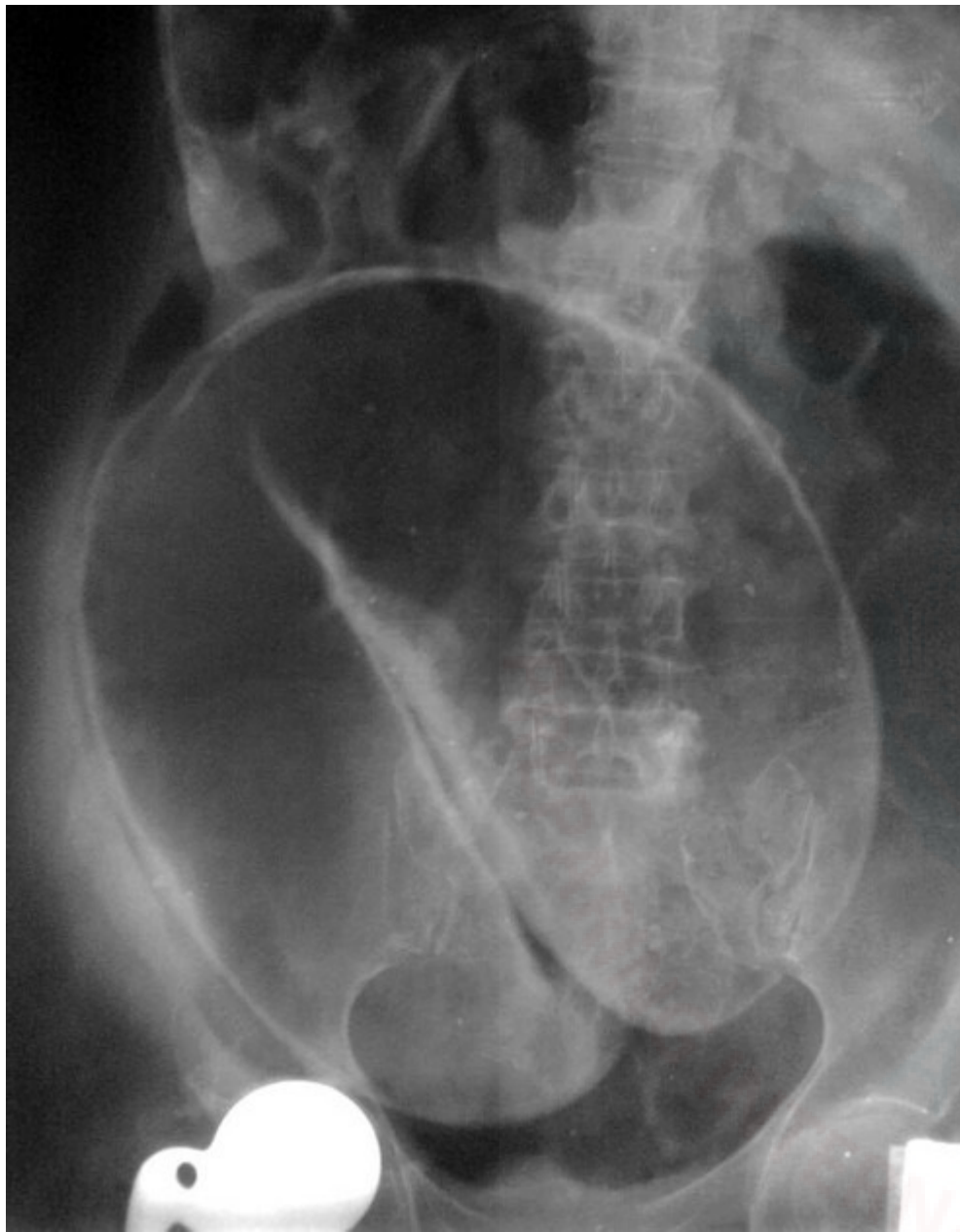
It is also seen in bed ridden patients.

Clinically presents like a large bowel obstruction.

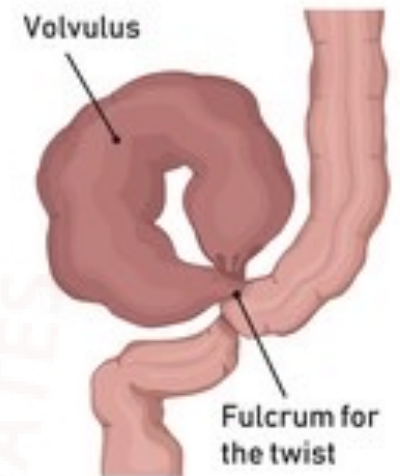
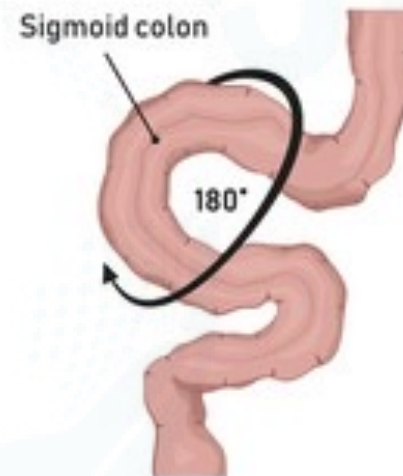
Investigation- Xray- Coffee bean sign

Treatment- Sigmoidoscopy to relieve pressure

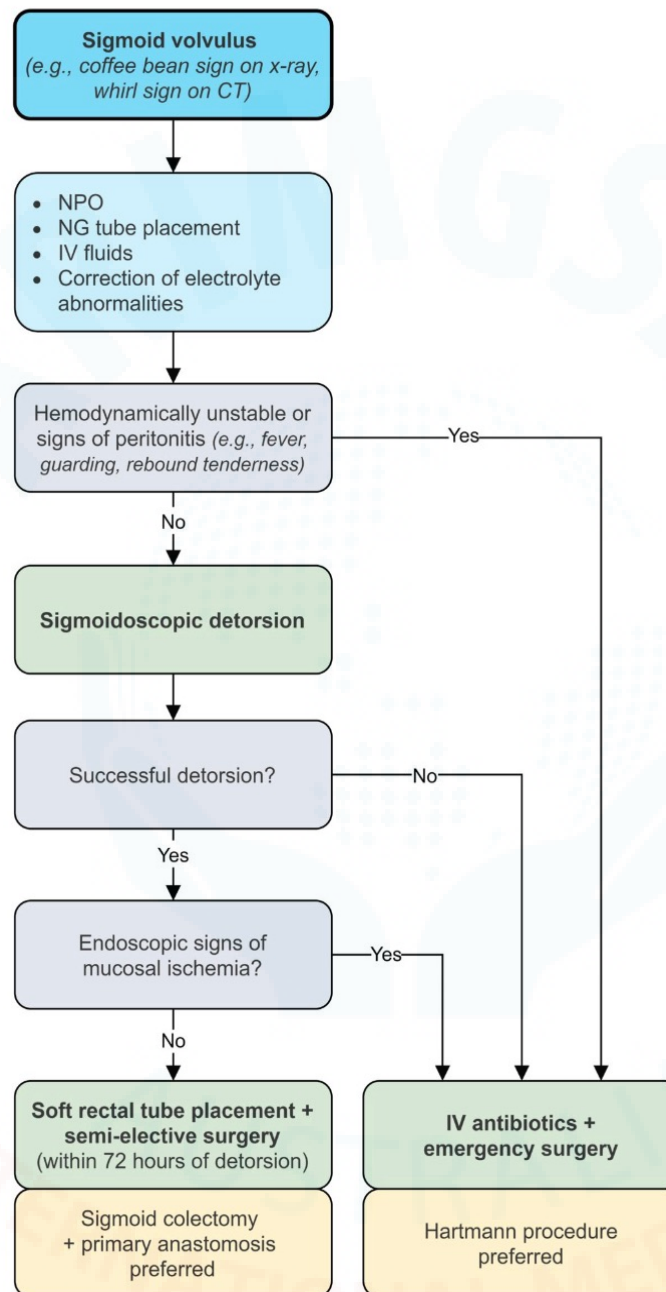
Surgery



VOLVULUS OF THE COLON



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Hartmann procedure is a surgical operation where the diseased segment of colon is removed, the rectal stump is closed, and an end colostomy is formed.

HERNIA

INGUINAL HERNIA(M/C):

DIRECT HERNIA:

- More common in older age group.
- More common B/L
- It happens due to a weakness in the muscle wall and protrudes through the superficial inguinal ring
- It doesn't extend to the scrotum.
- Lesser incidence of strangulation

INDIRECT HERNIA:

- It can occur at any age
- It travels through the inguinal canal and can present at the scrotum.
- Increased incidence of strangulation.

CLINICAL FEATURES

Presents with lump- that may reduce spontaneously when lying down or reducing activity that increases IA pressure

Dragging sensation

Cough impulse+

If pain / if cough impulse not present/ irreducible consider strangulation.

In strangulation can present with features of bowel obstruction.

MANAGEMENT

INVESTIGATIONS-

It is considered a clinical diagnosis.

But in cases where diagnosis is difficult such as obese individuals can do **USG at first step**

MRI is considered the best step in terms of imaging.

MANAGEMENT:

Birth- 6 weeks- Surgery in 2 days

6 weeks- 6 months- Surgery in 2 weeks

>6 months- Surgery in 2 months

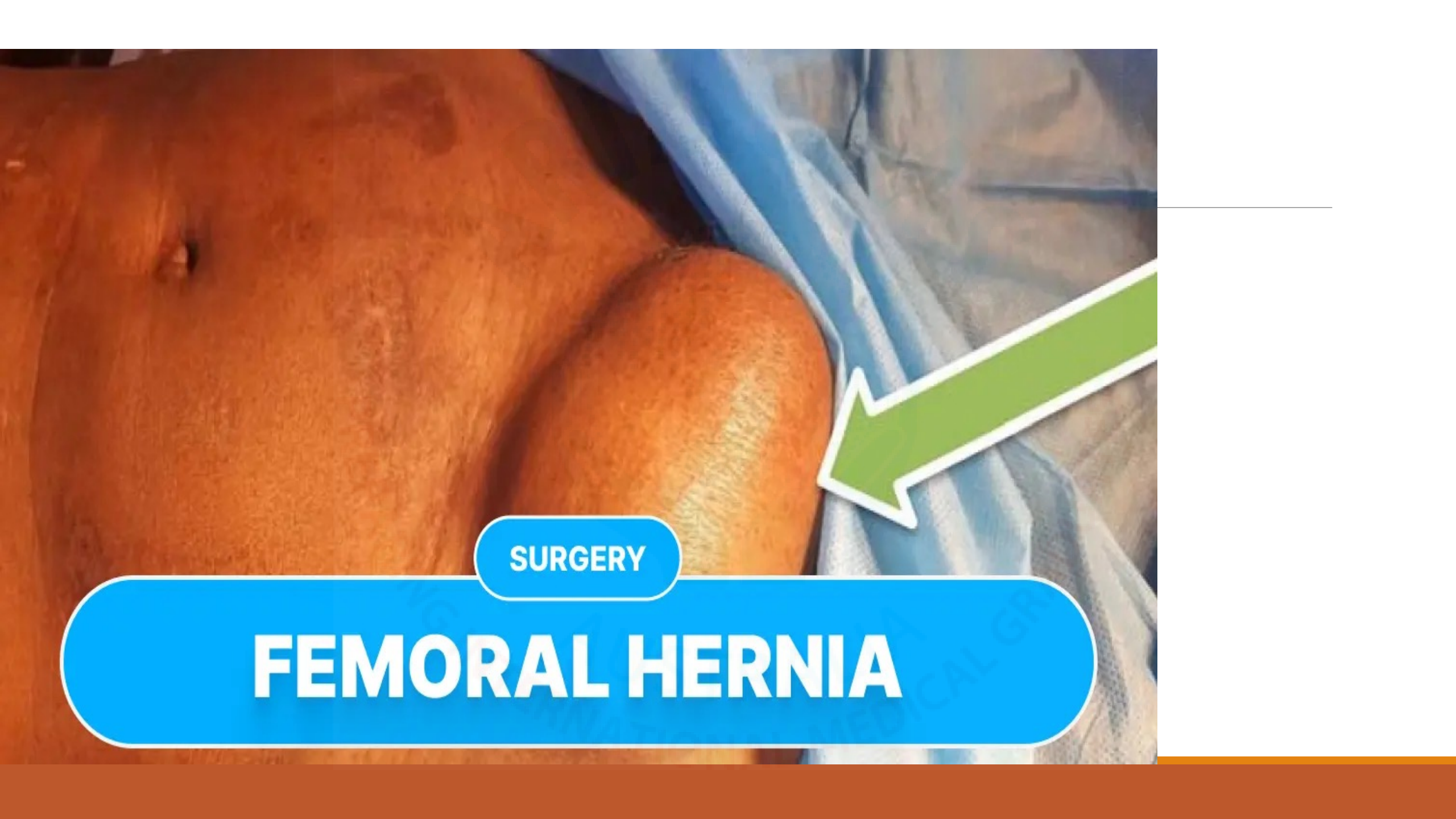
In adults- Simple hernia- surgery can be elective;

The surgeries done include- either open (**Lichtenstein procedure– open mesh repair – Gold standard**) or Laparoscopic **TAPP (Transabdominal preperitoneal / TEP (Totally extraperitoneal)**

Strangulated hernias- Laparoscopy is contraindicated.

FEMORAL HERNIA

- More common in Females
- **More likely to strangulate / incarcerate**
- It is present below and lateral to the pubic tubercle i.e. at the femoral triangle.
- It is usually small and can be missed.
- It requires **surgery due to increased risk of strangulation.**



SURGERY

FEMORAL HERNIA

INCISIONAL HERNIA

- It is the 2nd m/c hernia
- It is usually iatrogenic presenting at the location of a previous scar
- It is best seen while coughing in an erect position.
- It is a clinical diagnosis but if required CT can be done
- If they are symptomatic in any way – in terms of discomfort or a cosmetically unacceptable bulge – referral should be made to a suitably qualified general surgeon.



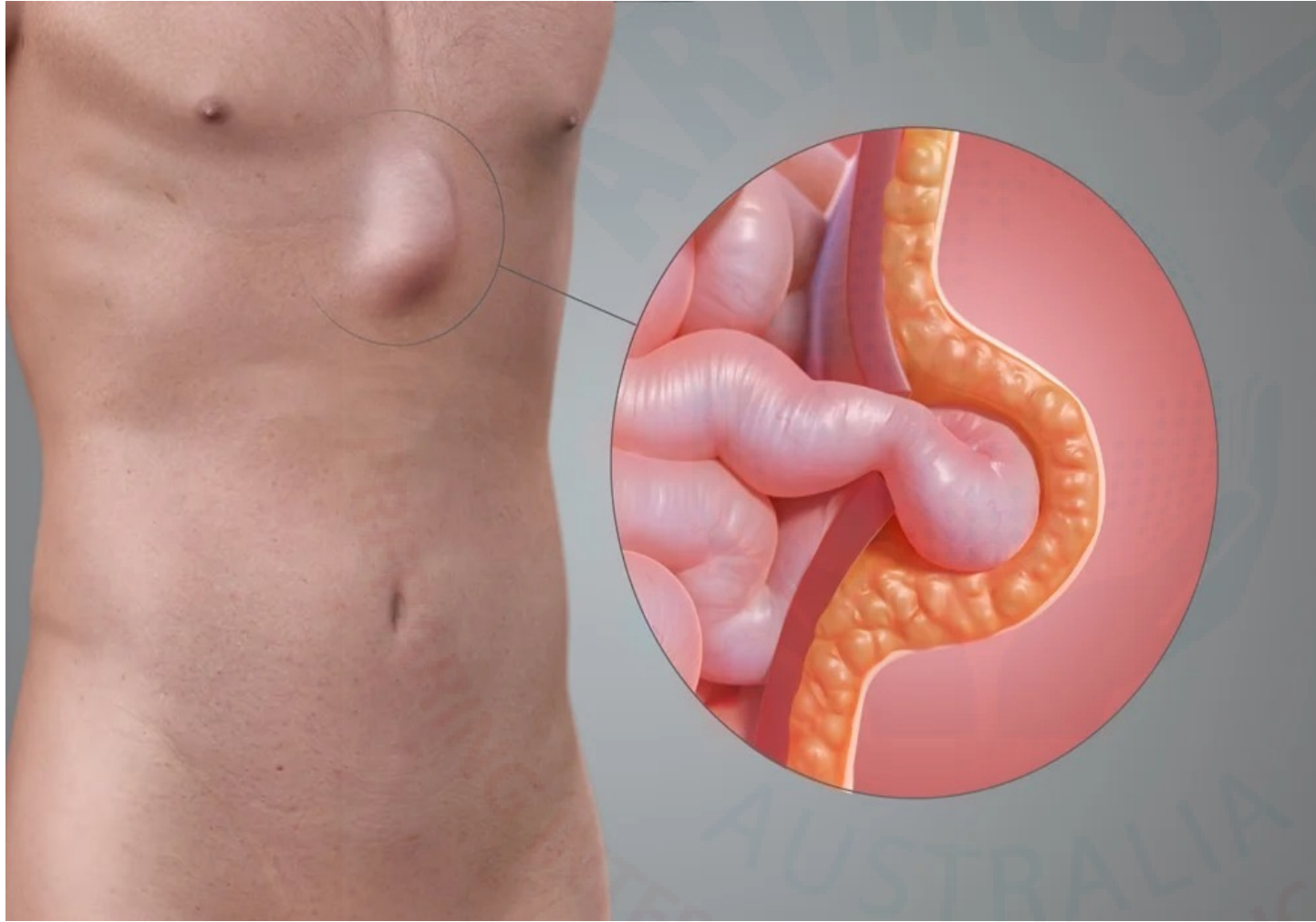
EPIGASTRIC HERNIA

- It is seen when the abdominal contents protrude through a weakness in the abdominal wall between the umbilicus and the sternum.
- It is best seen in a supine position with the shoulders raised.
- If small can be left alone

MX - **Surgical repair (definitive)**

Small defect → primary suture repair

Larger defect → **mesh repair**



UMBILICAL HERNIA

Umbilical hernias are common in babies and toddlers due to delayed closure of the umbilical cicatrix.

This presents as a soft lump with no redness or tenderness. Incarceration (hernia trapped in place) is rare and most umbilical hernias will close spontaneously by the age of 3 years.

Refer to the General Surgery Department when:

- **Suspected omphalomesenteric duct remnant [which normally obliterates by 5-7 WOG]** (failure of the duct to close and reabsorb once the umbilicus is formed in the foetus ; this may present as an umbilical mass, secretion from the umbilicus or appear as an umbilical polyp or granulation tissue)
- **Patent urachus** (failure of the embryonic link between the bladder and the umbilical cord to close and reabsorb this may present as intermittent leakage of urine from the umbilicus, periumbilical erythema, umbilical swelling, inflammation or infection).
- There is difficulty in reducing hernia or if there is any discharge.
- The umbilical hernia has not resolved by age 3.

Urachus

**Navel
(belly button)**

Urachus

Urinary bladder



INTERNATIONAL MEDICAL

GRADUATES

HAEMORRHOIDS

Haemorrhoids are swollen and inflamed veins in the rectum and anus that cause discomfort and bleeding.

Haemorrhoids have been divided into two types: internal and external.

INTERNAL HAEMORRHOIDS:

Usually happens due to a disturbance in bowel evacuation- diarrhea/constipation

Lack of fiber in diet

Inadequate water intake

INTERNAL HAEMORRHOIDS

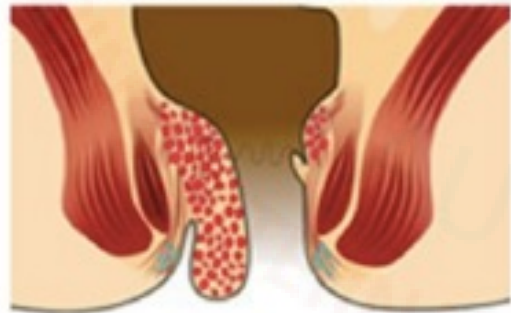
1st Degree: No Prolapse
Just prominent vessels



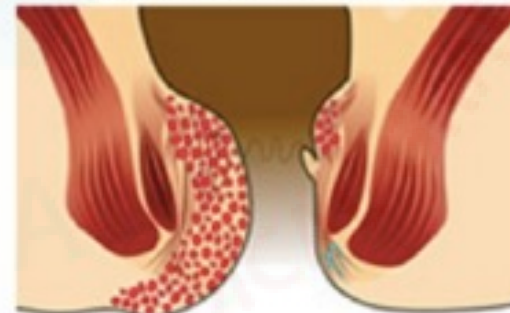
2nd Degree: Prolapse (come out) with strain
but spontaneously reduce (go back in)



3rd Degree: Prolapse with strain
and have to be pushed back in



4th Degree: Prolapsed out and
cannot be reduced or pushed back in



INTERNAL- CONTD

CLINICAL FEATURES:

Painless bleed separate from the faeces

Mucoid discharge

Irritation and itching can happen

Feeling of a lump

Feeling of an incomplete bowel evacuation

EXTERNAL HAEMORRHOIDS

They occur below the dentate line and can present as tags/hematomas.

External - Swollen veins form underneath the skin around your anus.

Thrombosed - A blood clot forms in an external hemorrhoids.

The symptoms are more or less the same except ; the external haemorrhoids give rise to significant pain and can cause the feeling of a lump, itchiness & irritation around the anal area.

External hemorrhoids cause symptoms in the following ways:

1. Acute thrombosis which may be linked to a change in diet, straining with severe constipation and physical activity.
2. Pain can also result from sudden distension of the overlying skin by the blood clot. This pain may last 5-12 days and with a resolution of the swelling, a skin tag is visible.

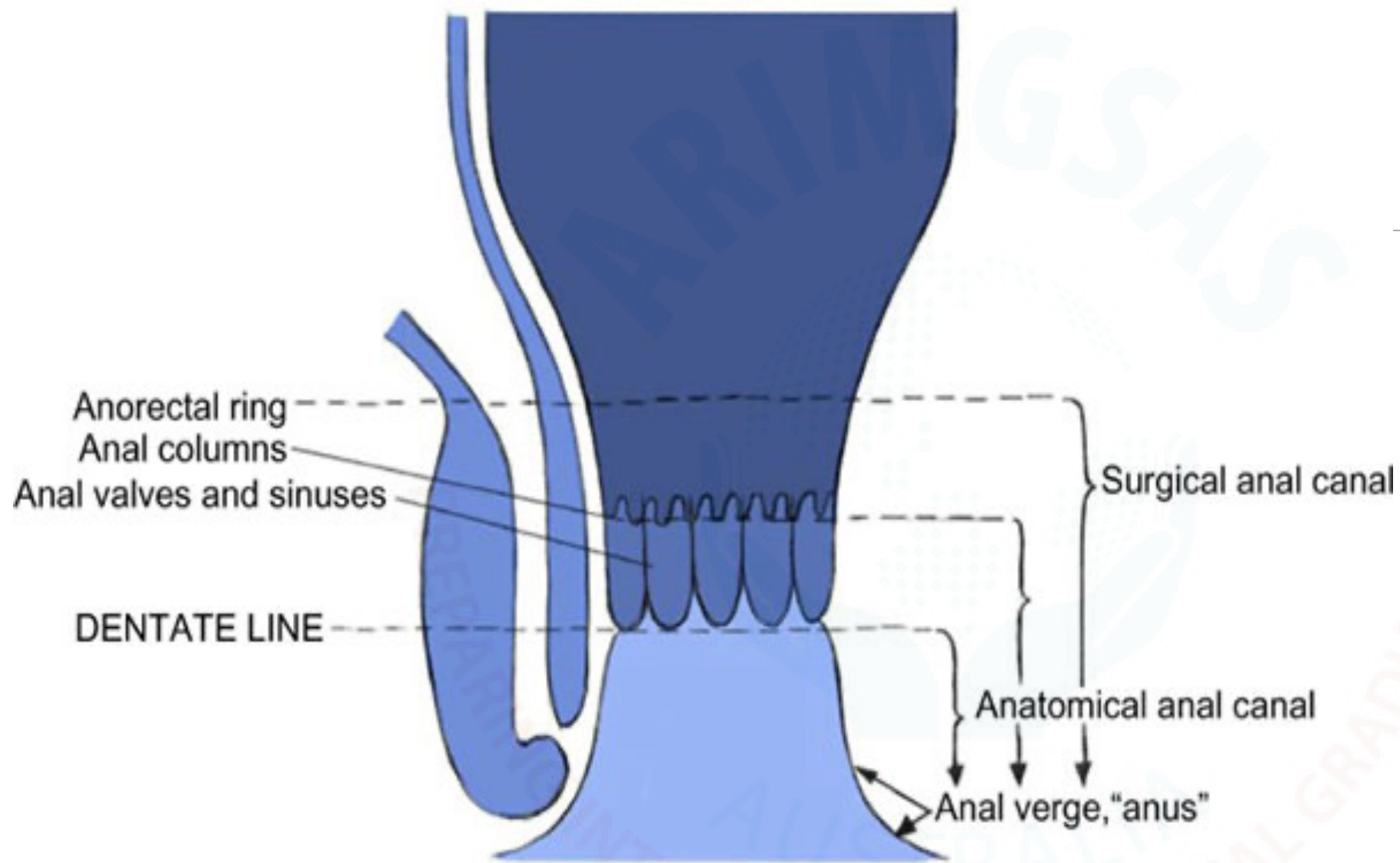


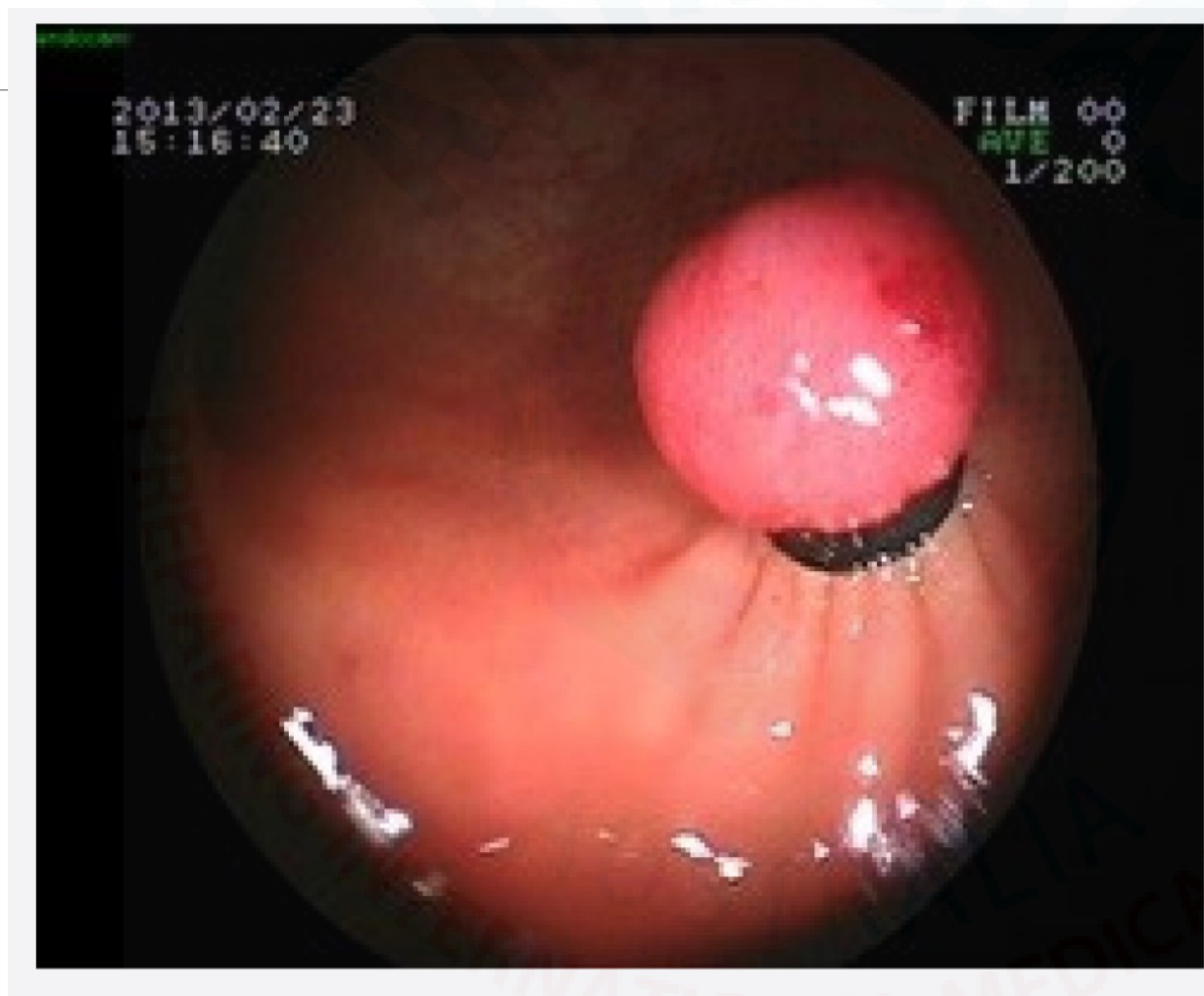
FIGURE 1. The demarcation of the anatomical and surgical canal.



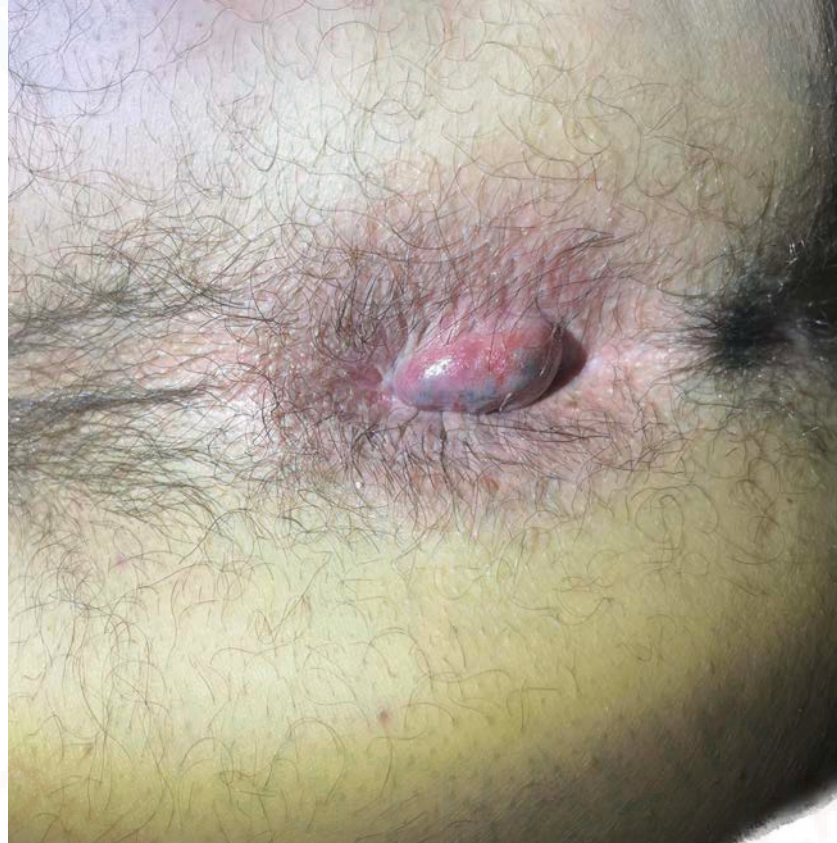
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TREATMENT

1. Dietary changes- increase water and fiber intake (**Grade 1 IH**)
2. Stool softeners/laxatives can be used (**Grade 1 IH**)
3. **Grade 2 - Rubber band ligation (TOC)**, (sclerotherapy – 5% phenol in Oil)
4. **Grade 3 – Hemorrhoidectomy (TOC)**, Rubber band ligation
5. **Grade 4 – Hemorrhoidectomy**
6. **Soak regularly in a warm bath or sitz bath**
7. **Hemorrhoid stapling.** This procedure, called stapled hemorrhoidopexy, blocks blood flow to hemorrhoidal tissue. It is typically used only for internal hemorrhoids.
8. If a painful blood clot has formed within an external hemorrhoid, (**thrombosed hemorrhoids**) a healthcare professional can remove the hemorrhoids. Removal can provide relief right away. This procedure is done after local anesthetic. **Thrombectomy works best when done within 72 hours of getting a clot.** If more than 72 hours, conservative management.



THROMBOSED EXTERNAL HAEMORRHOIDS



ANAL FISSURES

Anal fissure is characterised by a superficial tear in the anoderm distal (below) to the dentate line.

It is one of the most common anorectal problems presenting in healthcare settings, second only to haemorrhoids, and affects both genders equally.

Primary Anal Fissures might be idiopathic but is often correlated with local trauma, such as hard stools, prolonged diarrhea, vaginal delivery or anal penetration.

Secondary Anal Fissures is often characterised by multiple fissures or fissures off midline (lateral, anterior or irregular sites).

These fissures are associated with a variety of histories, including patients with previous anal surgeries, inflammatory bowel disease (especially Crohn's disease), granulomatous diseases (eg tuberculosis and sarcoidosis) and gastrointestinal malignancies (eg colon cancer)

CLINICAL FEATURES

Severe pain on defecation

Spots of bright red blood

Fear of defecation-resulting in constipation

EXAMINATION:

- Visual examination can be done
- **Never do a PR because it'll be severely painful for the patient**

ANAL FISSURES

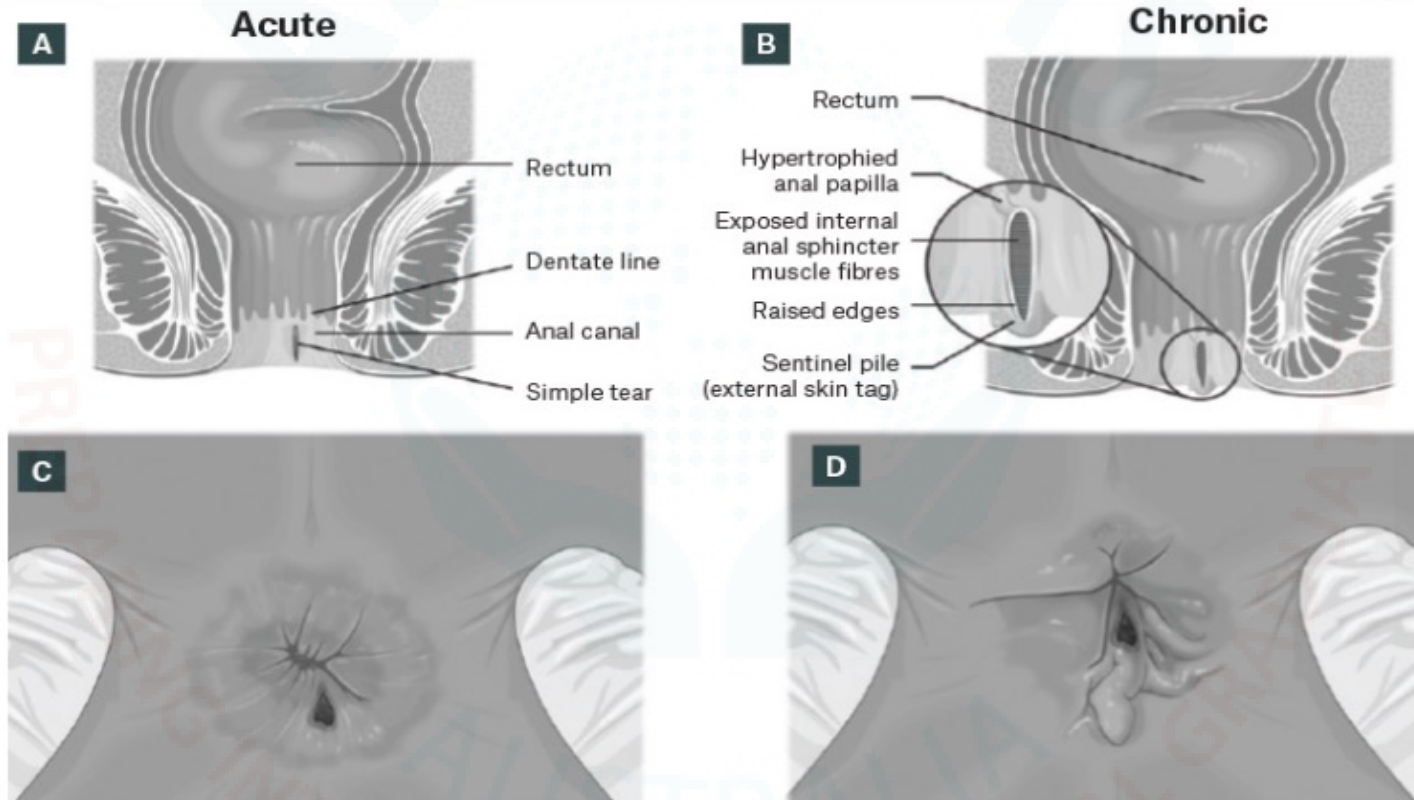


Figure 1. Coronal view of anal canal with acute anal fissure (A) and chronic anal fissure and sentinel tag (B). Lithotomy perineal view of acute anal fissure (C) and chronic anal fissure with sentinel tag (D).

Anal fissure



MANAGEMENT

1. Lifestyle changes- high fiber diet/water intake
2. Sitz bath
3. Topical GTN (glyceryltrinitrite) –relaxing the internal anal sphincter and improving mucosal blood flow.
4. CCB (nifedipine)-topical – relaxes anal sphincter – improves blood flow – promote healing
5. Injection botulinum toxin

Lateral internal Sphincterotomy (Gold standard surgical treatment) –

- ↓ Anal resting pressure
- Relieves sphincter spasm
- Improves blood flow
- Allows fissure healing

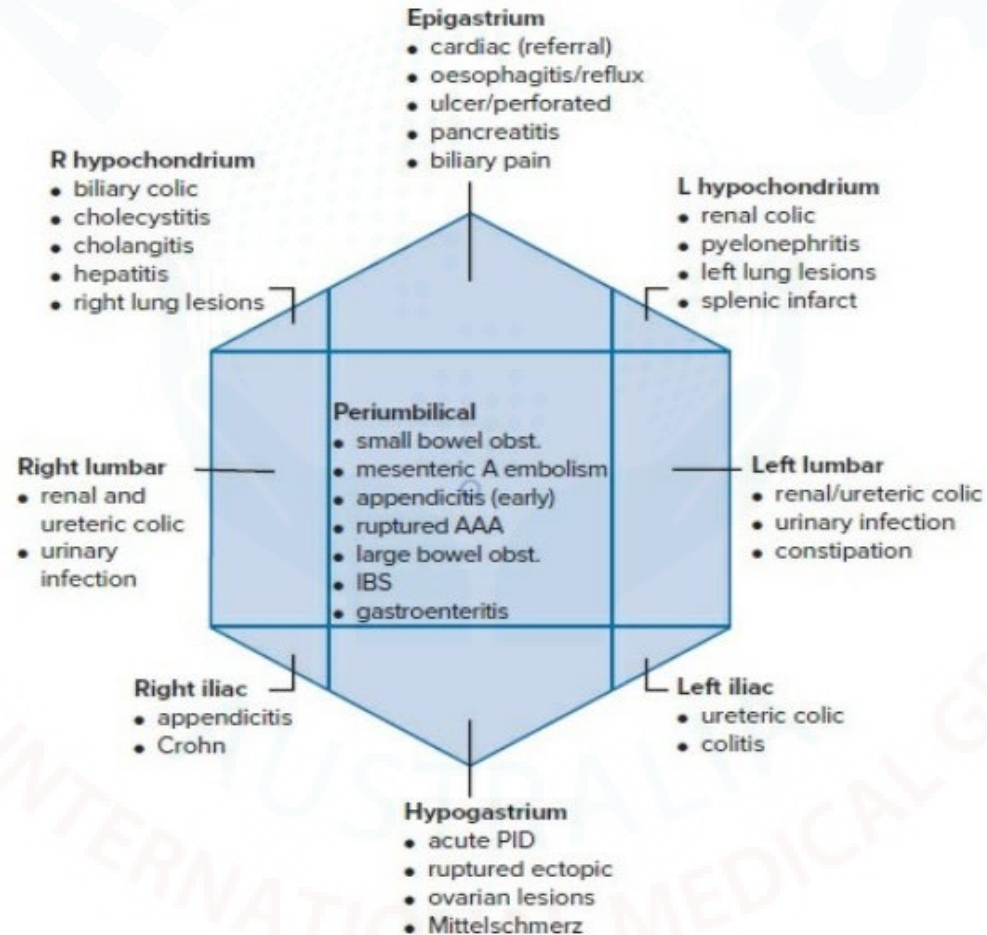
ABDOMINAL PAIN

Table A7 Acute abdominal pain: diagnostic strategy model

Page 6

Probability diagnosis	Pitfalls (often missed)
Acute gastroenteritis	Appendicitis (atypical)
Acute appendicitis	Myofascial tear
Biliary colic/renal colic	Pulmonary, e.g. pneumonia
Mittelschmerz/dysmenorrhea	Faecal impaction
Irritable bowel syndrome	Peptic ulcer
Serious disorders not to be missed	Seven masquerades checklist
Vascular	Depression
• ruptured AAA	Diabetes (ketoacidosis)
• dissecting aneurysm aorta	Drugs, esp. narcotics
• myocardial infarction (esp. inferior)	Anaemia—sickle cell
• mesenteric artery ischaemia	Endocrine (Addison, thyroid storm)
• ectopic pregnancy	Spinal dysfunction—referred
Severe infection	UTI including urosepsis
• ascending cholangitis	Is this patient trying to tell me something?
• peritonitis/perforated viscus	Consider psychogenic in recurrent atypical pain and
• acute salpingitis	Munchausen syndrome
• pancreatitis	Abnormal stress/anxiety
Neoplasia	
• bowel obstruction	
Strangulated hernia	

ABDOMINAL PAIN



PERITONITIS

Presentation :

- Patient lies quietly
- Pain aggravated by movement and coughing
- Board like rigidity
- Guarding
- No abdominal distension & decreased bowel sounds
- Max symptoms @ site of perforation
- Shallow breathing due to pain

Peritonitis due to perforated viscus is usually a polymicrobial infection caused by aerobic and anaerobic bowel flora: streptococci, Enterobacteriaceae and anaerobes.

Surgery is usually required.

Which of the following is not an indication of urgent surgical intervention?

- ☐ a. Localized peritonitis
- ☐ b. Progressive distension of abdomen
- ☐ c. Septicemia and abdominal findings
- ☐ d. Massive bowel distention (colon > 12 cm)
- ☐ e. Tender abdominal mass and hypotension

Correct Answer: a. Localized peritonitis

Answer Detail:

Indications for urgent abdominal surgical interventions include:

1-Diffuse peritonitis(localized peritonitis is not always an indication).

2-Severe or increasing localized tenderness.

3-Progressive abdominal distension.

4-Tender mass with fever or hypotension (abscess).

5-Septicemia and abdominal findings.

7-Bleeding and abdominal findings.

8-Suspected bowel ischemia (acidosis,fever,tachycardia).

9-Massive bowel dilatation more than 12cm.

Localized peritonitis is not an indication for urgent surgical intervention and can be managed conservatively.So option a is correct response.

EMPIRICAL ANTIBIOTIC THERAPY FOR PERITONITIS DUE TO PERFORATED VISCUS

Three drug regimen (5 days):

- IV - Gentamicin + Metronidazole + Amoxicillin / Ampicillin
 - Later switch to oral therapy : Amoxiclav
- Patients with residual undrained intra- abdominal collections or abscesses often require a longer duration of therapy - up to 4 to 6 weeks depending on clinical and radiological progress.

A 45-year-old mother of four children presents with the acute onset of severe central abdominal pain which began about 6 hours ago but has now moved to the right iliac fossa. Initially it was colicky, but now is more constant. It is associated with nausea and anorexia. Normal last menstrual period was 7 days ago. Her T 37.8C, PR 90, BP 110/70 mmHg, and she has tenderness in the right iliac fossa. there is some localised guarding but no abdominal rigidity. psoas sign is positive. PR examination demonstrates tenderness on the right, with no blood or faeces on the glove. which one of the following would be the most appropriate best management for this patient ?

1. Prescribe oral antibiotics for ten days
2. Commence IV fluids and antibiotics
3. Administer a non opioid analgesic
4. Appendicectomy
5. Arrange urgent abdominal CT scan

A 45-year-old mother of four children presents with the acute onset of severe central abdominal pain which began about 6 hours ago but has now moved to the right iliac fossa. Initially it was colicky, but now is more constant. It is associated with nausea and anorexia. Normal last menstrual period was 7 days ago. Her T 37.8C, PR 90, BP 110/70 mmHg, and she has tenderness in the right iliac fossa. there is some localised guarding but no abdominal rigidity. psoas sign is positive. PR examination demonstrates tenderness on the right, with no blood or faeces on the glove. which one of the following would be the most appropriate best management for this patient ?

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3. Administer a non opioid analgesic
4. **Appendicectomy**
5. Arrange urgent abdominal CT scan

A 14-year-old schoolboy is brought by his mother to the ED with a 3-day history of right lower quadrant pain. The pain started gradually and slowly moved to the right lower quadrant. He has lost his appetite and become nauseated. He has had no vomiting, no diarrhoea and no dysuria. Apart from a viral URTI 1 week ago, he has been well. He has had no previous surgery.

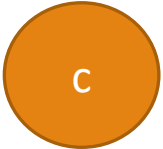
On examination, he looks well and is lying very still. His BP 115/60, HR 94, RR 20, OSRA 100% and T 37°C. Heart sounds are normal. His lungs are clear. There is reactive cervical, axillary and groin lymphadenopathy. His abdomen is soft, with generalized tenderness to palpation in the right lower quadrant. No guarding or rebound tenderness are present. Cough impulse is negative. The scrotum is normal. What is the most likely diagnosis?

- A. Appendicitis
- B. Inguinal hernia
- C. Mesenteric adenitis
- D. Urinary tract infection
- E. Testicular torsion

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On examination, he looks well and is lying very still. His BP 115/60, HR 94, RR 20, OSRA 100% and T 37°C. Heart sounds are normal. His lungs are clear. There is reactive cervical, axillary and groin lymphadenopathy. His abdomen is soft, with generalized tenderness to palpation in the right lower quadrant. No guarding or rebound tenderness are present. Cough impulse is negative. The scrotum is normal. What is the most likely diagnosis?

- A. Appendicitis (no guarding & rebound tenderness)
- B. Inguinal hernia (cough impulse negative & no groin swelling)
- C. Mesenteric adenitis**
- D. Urinary tract infection
- E. Testicular torsion

C

A 28-year-old female underwent an appendectomy yesterday, after presenting acutely with appendicitis. The appendix was removed successfully, with no issues reported during surgery. On review today the patient has vomited several times and complains of severe nausea. On examination, the abdomen appears distended, but the surgical wound looks healthy, with no evidence of discharge or erythema. The abdomen is not tender to palpation but it is significantly distended. Auscultation does not reveal any bowel sounds. The patient has not yet opened her bowels since the operation. Vital signs are within normal limits and post-op full blood count and electrolytes appear stable. Which of the following is the most likely diagnosis?

- A. Bowel perforation
- B. Constipation
- C. Wound infection
- D. Intra-abdominal abscess
- E. Paralytic ileus

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- A. Bowel perforation
- B. Constipation
- C. Wound infection
- D. Intra-abdominal abscess
- E. **Paralytic ileus**

A 44 years-old alcoholic man with sudden onset of epigastric pain radiating around to the back. He has had 6 episodic vomiting. On examination he has a tender epigastrium. He feels better on leaning forward. He is currently going into shock. What is the most likely cause?

- A. DU rupture
- B. cholecystitis
- C. Acute pancreatitis
- D. SBO
- E. Cholangitis

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- A. DU rupture
- B. Cholecystitis (RUQ pain, murphy sign)
- C. **Acute pancreatitis**
- D. SBO
- E. Cholangitis

C

A 56-year-old male presents with sudden onset severe epigastric abdominal pain that radiates to the back. The pain improves when he leans forward and he denies any recent trauma. He has also vomited several times since the pain started. He has a background of alcohol excess and admits to currently drinking 4 bottles of whisky a week. On examination, there is central abdominal tenderness and some bruising is present on the abdominal flanks. What is the name of the clinical sign shown in the image below?

1. Shifting dullness
2. Grey-Turner's sign
3. Rovsing's sign
4. Cullen's sign
5. Murphy's sign



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5. Murphy's sign



A 64-year-old male presented with chronic upper abdominal pain, weight loss, jaundice and anorexia. On examination, he is grossly yellowish with a palpable mass in the epigastrium. CT scan of the abdomen confirms the presence of pancreatic cancer. He has a history of alcohol abuse, smoking and type 2 diabetes mellitus for last 25 years. He has thin body habitus otherwise.

Which of the following is not associated with increased risk of developing pancreatic cancer.

- ☐ a. Long-standing diabetes mellitus
- ☐ b. Smoking
- ☐ c. Thin body habitus
- ☐ d. Inactivity
- ☐ e. Chronic pancreatitis

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- ☐ c. Thin body habitus
- ☐ d. Inactivity
- ☐ e. Chronic pancreatitis

c

A 56-year-old man presented with acute severe epigastric pain, fever, nausea and vomiting. Past medical history includes type 2 diabetes mellitus, cardiomyopathy and hypertension. Abdominal ultrasound shows the stone in the bile duct and diameter of the bile duct is 6 mm and multiple gallstones.

Blood tests show elevated conjugated bilirubin, elevated white cells and normal haemoglobin. Liver function tests show six times rise in alanine aminotransferase and aspartate aminotransferase. Lipase and amylase also elevated.

What is the most appropriate next step in management?

- ☐ a. CT abdomen
- ☐ b. ERCP
- ☐ c. MRCP
- ☐ d. Endoscopy
- ☐ e. Monitor liver function tests

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- ☐ b. ERCP
- ☐ c. MRCP
- ☐ d. Endoscopy
- ☐ e. Monitor liver function tests

Stone in bile duct confirmed – ERCP
CBD stone + pancreatitis

B

A 45-year-old alcoholic male presents with acute upper abdominal pain which is steady and is located in right upper quadrant and mid-epigastrium. The patient is also complaining of nausea and vomiting. He is sitting on bed bending forward. On examination, epigastrium is slightly tender with fever and tachycardia.

Which of the following is the most likely diagnosis?

- ☐ a. Acute cholecystitis
- ☐ b. Acute pancreatitis
- ☐ c. Acute gastritis
- ☐ d. Acute gastro-oesophageal reflux disease.
- ☐ e. Alcohol intoxication

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Acute cholecystitis – pain not relieved by leaning forward, murphys sign +ve)

B

A 34-year-old alcoholic man presented with epigastric pain. The abdominal CT scan confirmed the diagnosis of acute pancreatitis. He was managed in hospital analgesics and intravenous fluids.

He developed mild discomfort in the epigastrium 3-4 weeks later. CT abdomen showed 4cm pseudocyst.

What will you do next?

- ☐ a. Endoscopic decompression
- ☐ b. Open surface decompression
- ☐ c. Observe
- ☐ d. Percutaneous catheter drainage
- ☐ e. Urgently take him to surgical theatre

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- ☐ b. Open surface decompression
- ☐ c. Observe
- ☐ d. Percutaneous catheter drainage
- ☐ e. Urgently take him to surgical theatre

Drainage when:

Size > 6cm

>6 weeks

Infection

Severe symptoms

C

A patient is brought in to A&E with a distended, hard abdomen, complaining of generalised abdominal pain. On questioning, they admit to not opening their bowels in the last 5 days. The patient cannot recall the last time they passed flatus. An abdominal X-ray confirms a diagnosis of bowel obstruction. The patient is informed they are to be nil by mouth and an IV cannula is inserted to allow administration of IV fluids. Which of the following would be the most appropriate next step?

1. Perform a manual evacuation of stool
2. Insert an NG tube
3. Prescribe a stimulant laxative
4. Perform an enema
5. Encourage oral fluids

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A 69-year-old woman presents 4 weeks after a myocardial infarction with a sudden onset of severe central abdominal pain in association with vomiting and bloody diarrhoea. Her abdomen is mildly tender, not distended, with rebound tenderness. On examination, she is alert but crying in pain, T 37.9C, pulse 104/min, BP 120/60 mmHg. Her ECG shows absent P waves. Her WCC is $13.7 (4.0-11.0 \times 10^9/L)$; and she has an elevated serum amylase and lactate dehydrogenase, and a metabolic acidosis. Which one of the following is the most appropriate next step in management for this condition?

- a) Papillotomy with endoscopic retrograde cholangiopancreatography
- b) Resection of Ischaemic bowel
- c) Transfemoral placement of an aortic endovascular stent-graft
- d) Nasogastric suction, intravenous fluids, antibiotics and analgesia
- e) Laparotomy for debridement of a pancreatic pseudocyst

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- a) Papillotomy with endoscopic retrograde cholangiopancreatography
- b) Resection of Ischaemic bowel (maybe considered later on)
- c) Transfemoral placement of an aortic endovascular stent-graft
- d) Nasogastric suction, intravenous fluids, antibiotics and analgesia (initial step in mesenteric ischaemia)
- e) Laparotomy for debridement of a pancreatic pseudocyst

D

Mrs. Hatch, a 44 year old woman, has been admitted under the surgical unit with small bowel obstruction. She has not benefited from conservative management, and gastrograffin follow-through has failed to produce a therapeutic laxative effect.

Unfortunately, it has now been 1-week since she has passed a bowel motion or flatus, and the surgical team advises upon the need for a diagnostic and potentially therapeutic laparotomy; otherwise she may sicken. Mrs. Hatch is defiant towards the idea as her brother became very ill and required ongoing care after undergoing a therapeutic laparotomy with stoma placement. In fact, she states that if there are no further options, she will discharge herself from hospital. What is the most appropriate next step?

- A. Order involuntary detainment, as the patient requires immediate intervention
- B. Refer the patient to psychiatry
- C. Organise the paperwork for patient self-discharge against medical advice
- D. Arrange a neuropsychiatric assessment for decision-making competency
- E. Advise the husband to become the surrogate decision-maker

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C

A 88 year-old female who resides in high level care, comes with a history of increasing distension of abdomen associated with obstipation for the past two days. She has been taking laxatives for four years for chronic constipation. On examination she has a distended abdomen and DRE has shown an empty rectum.

What is the most likely diagnosis?

- A. Caecal cancer
- B. Faecal impaction
- C. Sigmoid volvulus
- D. Small bowel obstruction
- E. Pain-induced bowel obstruction

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C

A 66 year-old man, who suffers from Parkinson's, came with abdominal pain and distension. There is no history of previous surgery. Patient does complain of not being able to pass stool since four days.

What is the most likely cause?

- A. Adhesions
- B. Pseudo-obstruction
- C. Diverticulitis
- D. Caecal tumour
- E. Sigmoid volvulus

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- C. Diverticulitis
- D. Caecal tumour
- E. Sigmoid volvulus

B

A 35-year-old male presented with hypovolemic shock after having a blunt abdominal injury. The urgent laparotomy showed severely lacerated spleen and urgent splenectomy was performed to stop bleeding. His previous medical history is unremarkable for any co-morbid condition.

Which of the following is incorrect regarding this patient?

- ☐ a. There is long term risk of life threatening sepsis
- ☐ b. Encapsulated organisms are particularly virulent
- ☐ c. Life long prophylaxis with daily oral penicillin is recommended
- ☐ d. Vaccination against pneumococcus should be given as soon as possible
- ☐ e. Target cells may be found in blood

Correct Answer: c. Life long prophylaxis with daily oral penicillin is recommended

Answer Detail:

The correct answer is c.

Lifelong antibiotic prophylaxis is not recommended for this person who is an adult, otherwise healthy and has undergone splenectomy due to traumatic injury. Such patients usually need post splenectomy prophylaxis for 2 years.

Lifelong continuous antibiotic prophylaxis after splenectomy is recommended for children less than 5 years age and immunocompromised adults or in patients who have the underlying haematological disorder.

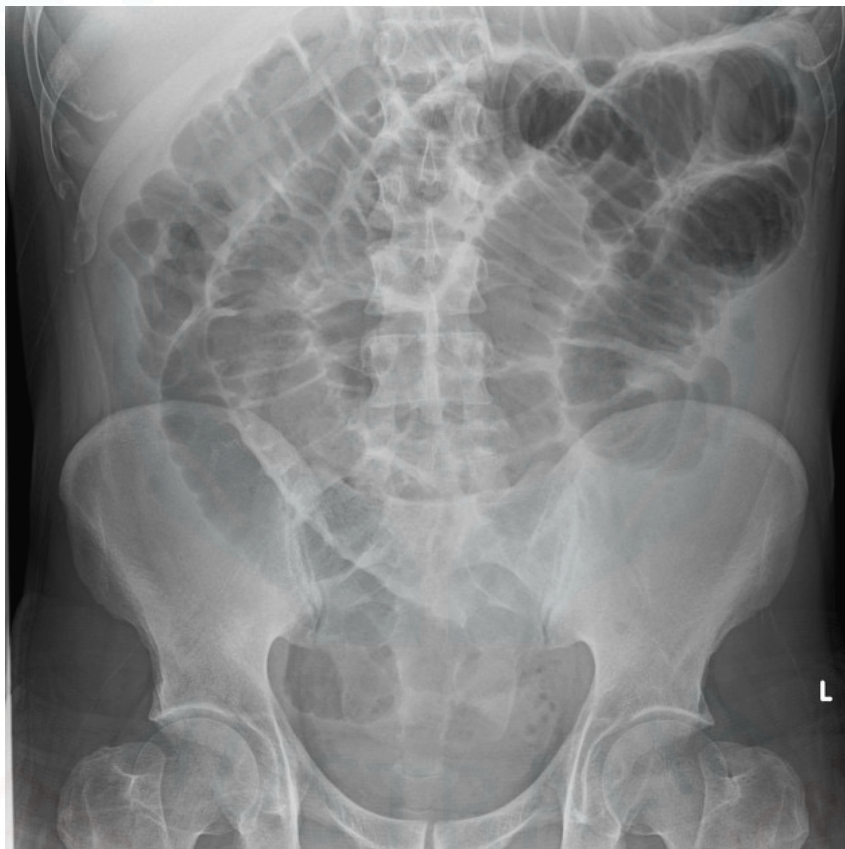
Splenectomized patients are at higher risk of life-threatening sepsis especially caused by encapsulated organisms like streptococcus pneumoniae, meningococcus and H. influenza, therefore vaccination against these organisms is recommended as soon as possible.

Target cells are deformed red blood cells that post-splenectomy patients because they are usually removed from the blood by spleen.

Penicillin is most commonly used antibiotic for post-splenectomy prophylaxis and it is usually recommended for 2 years for patient who not at increased risk of developing infection.

Patient came with epigastric pain, vomiting. Xray given.

1. Stone in CBD
2. Cholecystitis
3. Pancreatitis
4. SBO
5. LBO



Patient came with epigastric pain, vomiting. Xray given.

1. Stone in CBD
2. Cholecystitis
3. Pancreatitis
4. SBO
5. LBO

Case of acute pancreatitis, asking for initial investigation?

1. Amylase

2. USG

3. Lipase

4. CT

Case of acute pancreatitis, asking for initial investigation?

1. Amylase

2. USG

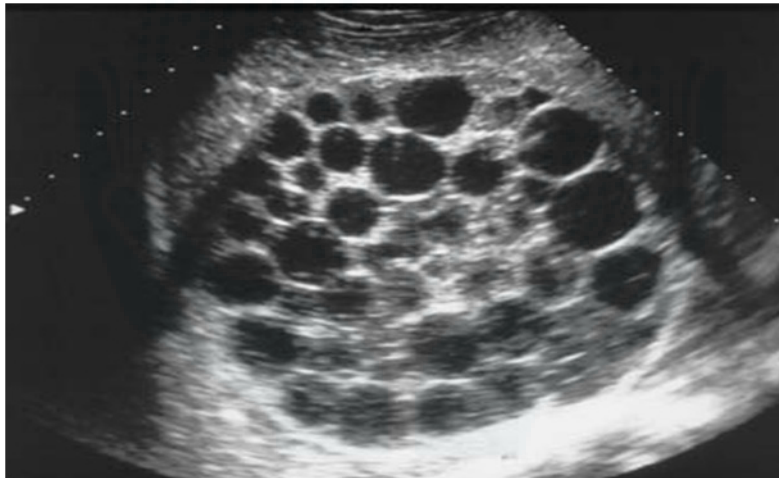
3. Lipase

4. CT

3

Farmer, 53, RUQ pain, discomfort, USG given, patient afebrile, vitals normal, no weight loss in history

1. Hydatid cyst
2. HCC
3. Liver Abscess



Farmer, 53, RUQ pain, discomfort, USG given, patient afebrile, vitals normal, no weight loss in history

- 1. Hydatid cyst
- 2. HCC
- 3. Liver Abscess

A man with history of pancreatitis 2 months ago, now comes with 10cms cystic mass with a thin rim exactly posterior to stomach on CT scan. Next management?

1. ERCP with duct drainage
2. Laparoscopy
3. Laparotomy
4. Conservative management
5. Endoscopic drainage

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HEAD AND NECK SURGERY

SALIVARY STONE

Salivary stones, also called sialolithiasis, are hardened mineral deposits that form in the salivary glands

Of all salivary gland stones, 80 percent form in the **submandibular salivary glands**, but they can form in any of the salivary glands, including:

- The parotid glands on the side of the face, near the ears
- The sublingual glands under the tongue (uncommon)

The **cause** is not known, but several factors are associated with salivary stone formation:

- Dehydration, due to inadequate fluid intake, illness, or medications such as diuretics (water pills) and anticholinergic drugs
- Trauma to the inside of the mouth
- Smoking
- Gum disease

SALIVARY STONE(SIALOLITHIASIS)

- Salivary stones cause swelling, pain or both in the salivary gland. Symptoms get worse when the person is eating or anticipating eating
-

○ INVESTIGATIONS :

- X-ray : 1st line (orthopantomogram)

- USS

- CT scan if still not visualized.

○ MANAGEMENT :

- **Conservative** – For small stones- hydration, moist heat therapy , NSAIDS, consuming sour food (increases salivation).
- **Surgical**- If conservative therapy fails- Sialendoscopy (endoscopic removal –therapeutic and diagnostic). If stones are large or recurrent- Excision.

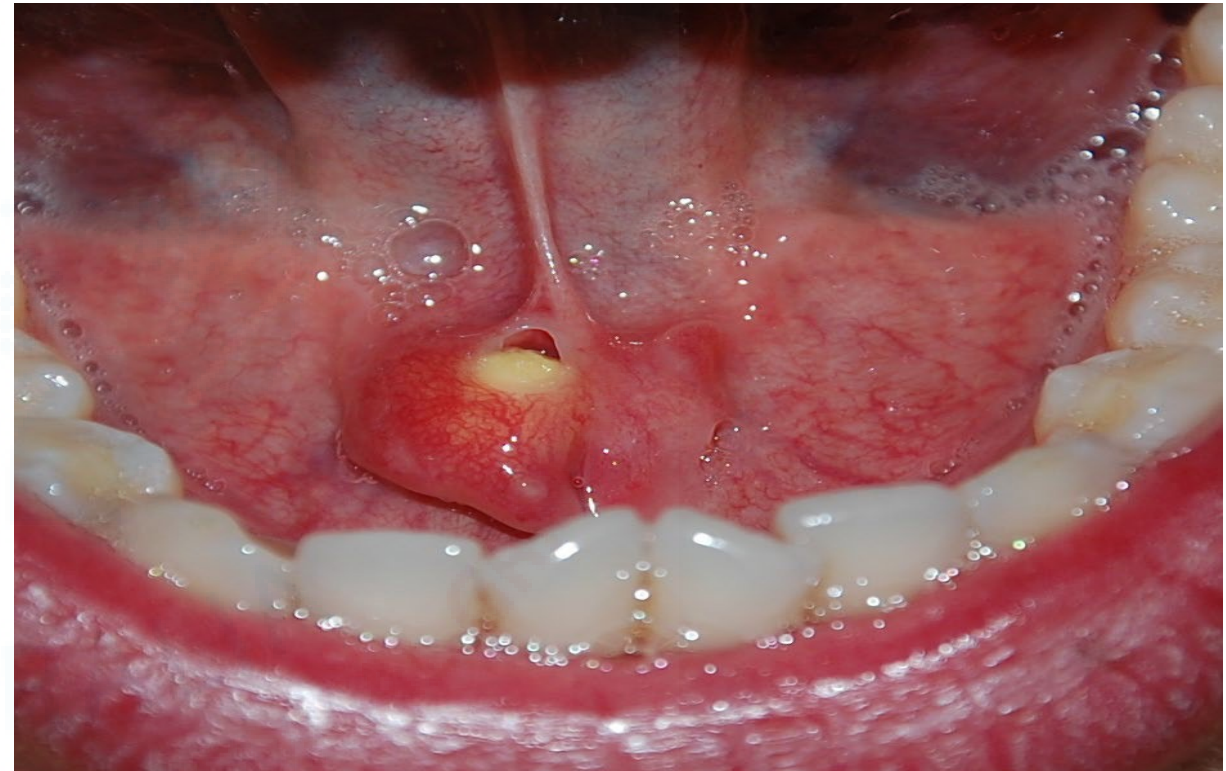


DIFFERENTIALS OF SALIVARY GLAND SWELLING

- Salivary stone obstruction
- Benign mesenteric hypertrophy
- Lymphadenopathy
- Acute spreading dental infections: Periodontal disease - Gingivitis - Periodontitis - Acute ulcerative gingivitis - Periodontal abscess
- **Sjogren syndrome** (chronic autoimmune disease that mainly affects exocrine glands like salivary glands & Lacrimal glands)
- Tumours : benign or malignant

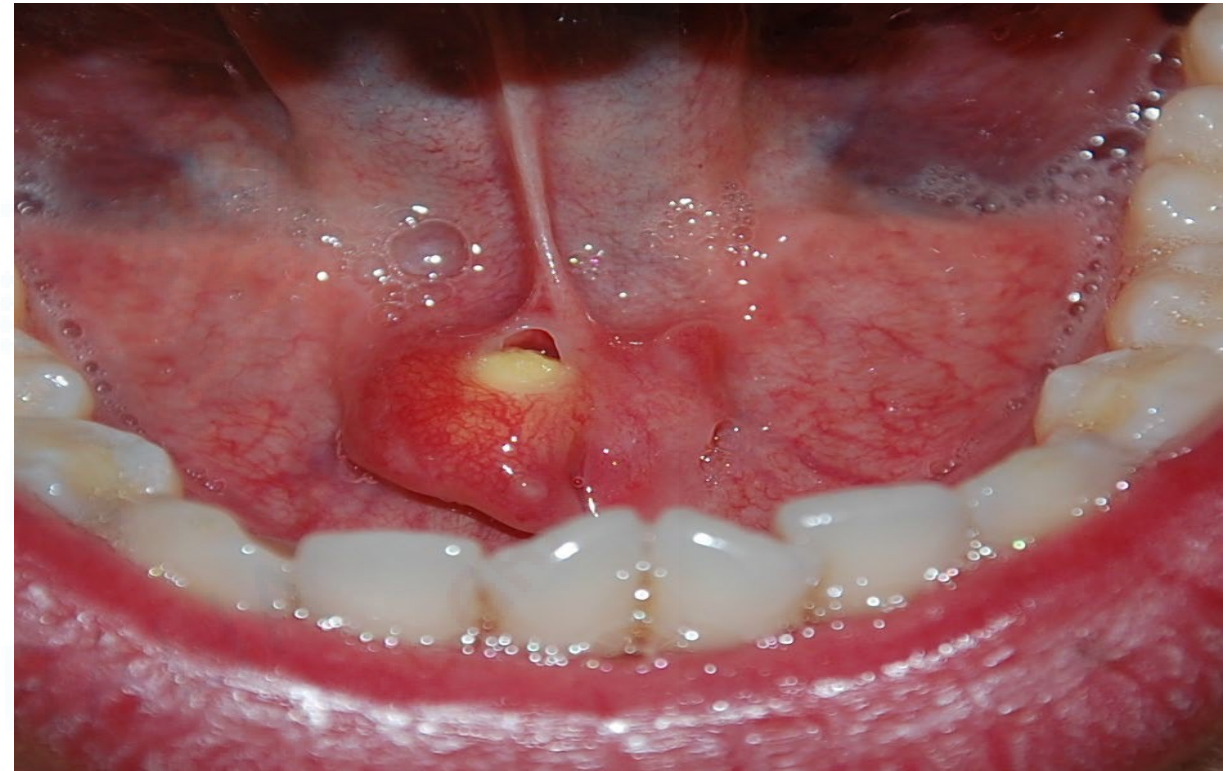
■ Your next px is a 35 yo man that consults because of a mass he found inside his mouth. What is the most likely DX?

1. Periodontal abscess
2. Gingivitis
3. Lymphoma
4. Sialolithiasis
5. Sialadenitis



■ Your next px is a 35 yo man that consults because of a mass he found inside his mouth. What is the most likely DX?

1. Periodontal abscess
2. Gingivitis
3. Lymphoma
4. Sialolithiasis
5. Sialadenitis



SIALADENITIS

- **Most commonly organism - Staph. aureus**
- **PAINFUL swelling**, glands is enlarged, hot and tense, with pus coming out from duct.
- **Other symptoms** - fever, decreased mouth opening, abnormal tastes. The patient is looks sick and may be dehydrated
- Does **NOT** affect facial nerve.
- **TREATMENT** : Hydration, Sour food, pain management, Antibiotics, gland massage.



AUSTRALIAN
INTERNATIONAL MEDICAL GRADUATES

BENIGN TUMORS

○Pleomorphic adenoma

○Adenolymphoma (Warthin's tumor) – more parotid specific

- Increase slow in size
- Painless, well circumscribed
- Do not cause facial nerve palsy

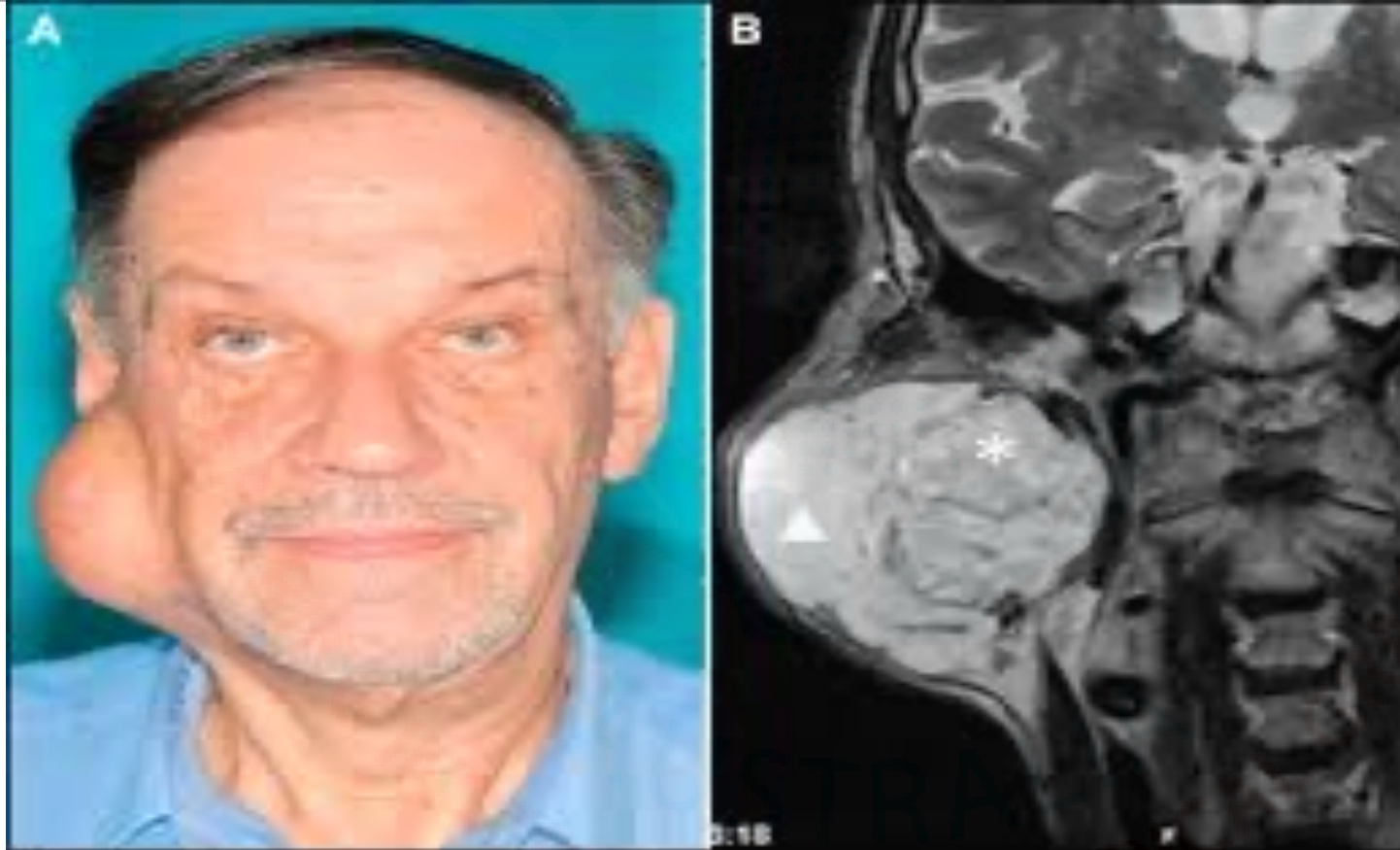
INVESTIGATIONS:

- USG – First
- CT – BEST
- FNAC-Needle biopsy (best)

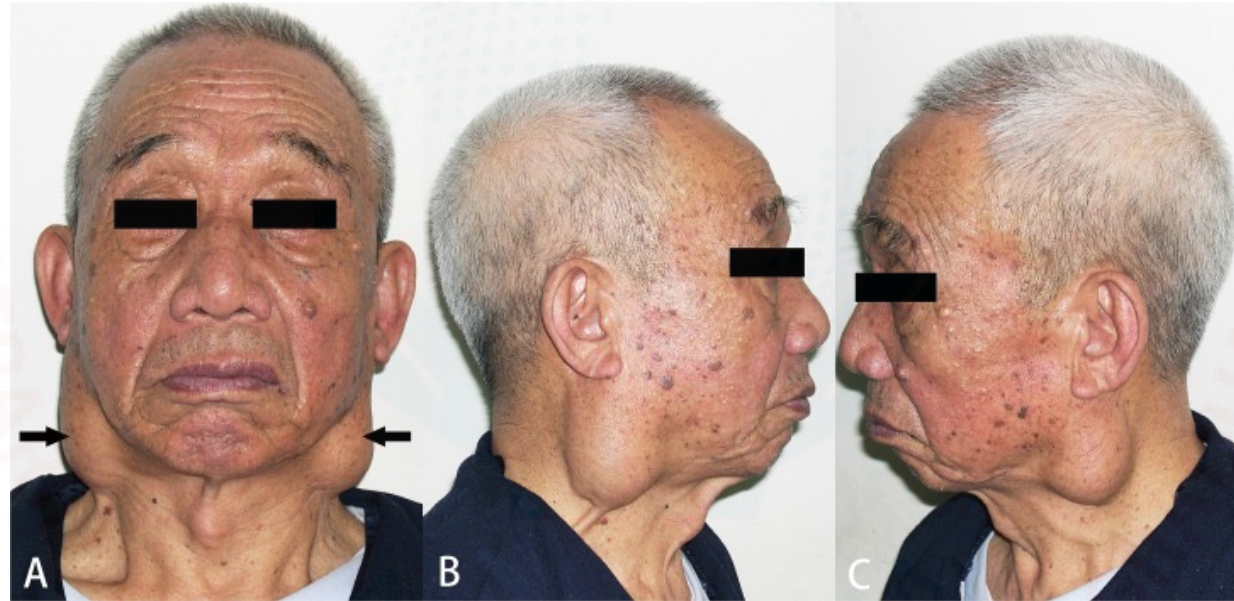
MANAGEMENT:

- Surgical excision with preservation of the facial nerve.

Pleomorphic adenoma



Warthin's tumor



MALIGNANT TUMOURS

- Adenoid cystic carcinoma

- Acinic cell carcinoma

- **Mucoepidermoid carcinoma- m/c**

- Squamous / adenocarcinoma

- Painful
- Faster increase in size, can ulcerate, lymphadenopathy
- **Cause facial nerve palsy (7th CN)**

- **INVESTIGATIONS:**

- Needle biopsy (best) + Imaging for staging of disease (CT/MRI)

- **MANAGEMENT:**

- Surgical resection

Simone is a 58 year man, who has come to see you at the GP clinic, with a left sided swelling of his parotid region. The swelling has been present over the last 4 months and has been increasing in size. He now is complaining of hearing loud noises and dryness of his left eye and dribbling saliva. On examination the swelling is non-tender. An image is seen below. What is the most likely diagnosis?

- A. Salivary stone
- B. Parotitis
- C. Adenoid cystic carcinoma
- D. Pleomorphic adenoma
- E. Sjogren



Simone is a 58 year man, who has come to see you at the GP clinic, with a left sided swelling of his parotid region. The swelling has been present over the last 4 months and has been increasing in size. He now is complaining of hearing loud noises and dryness of his left eye and dribbling saliva. On examination the swelling is non-tender. An image is seen below. What is the most likely diagnosis?

- A. Salivary stone (painful swelling)
- B. Parotitis (pain + fever/inflammation)
- C. Adenoid cystic carcinoma (facial nerve involvement & rapid size increase)
- D. Pleomorphic adenoma (painless, slow growing, no facial nerve involvement)

C



A female patient comes to see you with a swelling in front of her tragus, which has increased considerably. Additionally she complains of drooling of saliva. On examination, her vital observations are stable. The swelling feels like a cystic mass with no signs of inflammation.

What would be the best step in her management plan?

- A. FNAC
- B. USG of swelling
- C. Sialogram
- D. Intraoral X ray

A female patient comes to see you with a swelling in front of her tragus, which has increased considerably. Additionally she complains of drooling of saliva. On examination, her vital observations are stable. The swelling feels like a cystic mass with no signs of inflammation.

What would be the best step in her management plan?

- A. FNAC (best for parotid mass)
- B. USG of swelling (useful but doesn't give benign vs malignant)
- C. Sialogram (not used for tumor assessment)
- D. Intraoral X ray (no use)

A

PHARYNGEAL POUCH / ZENKER'S DIVERTICULUM

Zenker's diverticulum develops when the muscle between the throat and esophagus, known as the cricopharyngeus muscle, over-tightens, causing the throat above it to pouch out

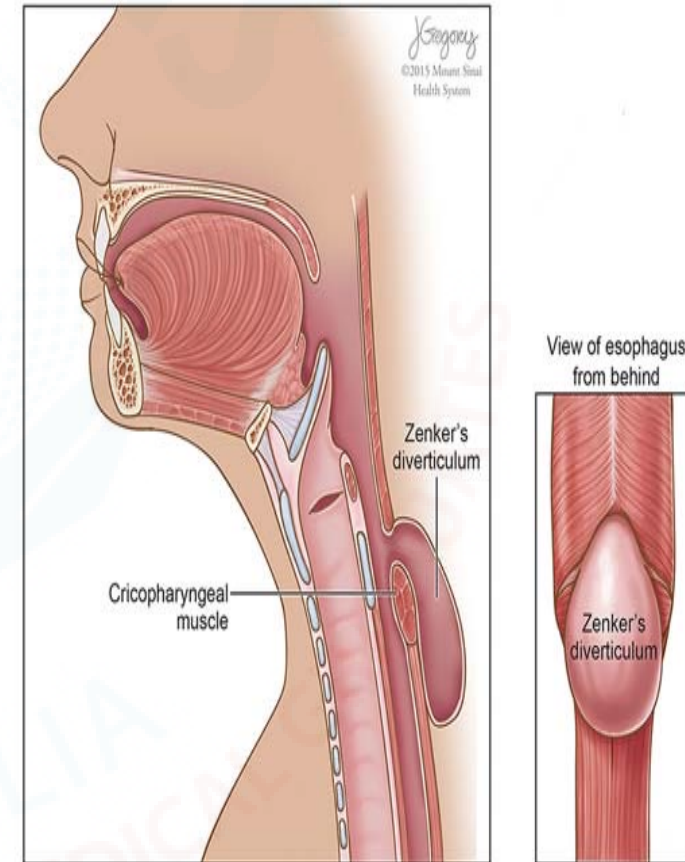
Most commonly males above 70 years of age.

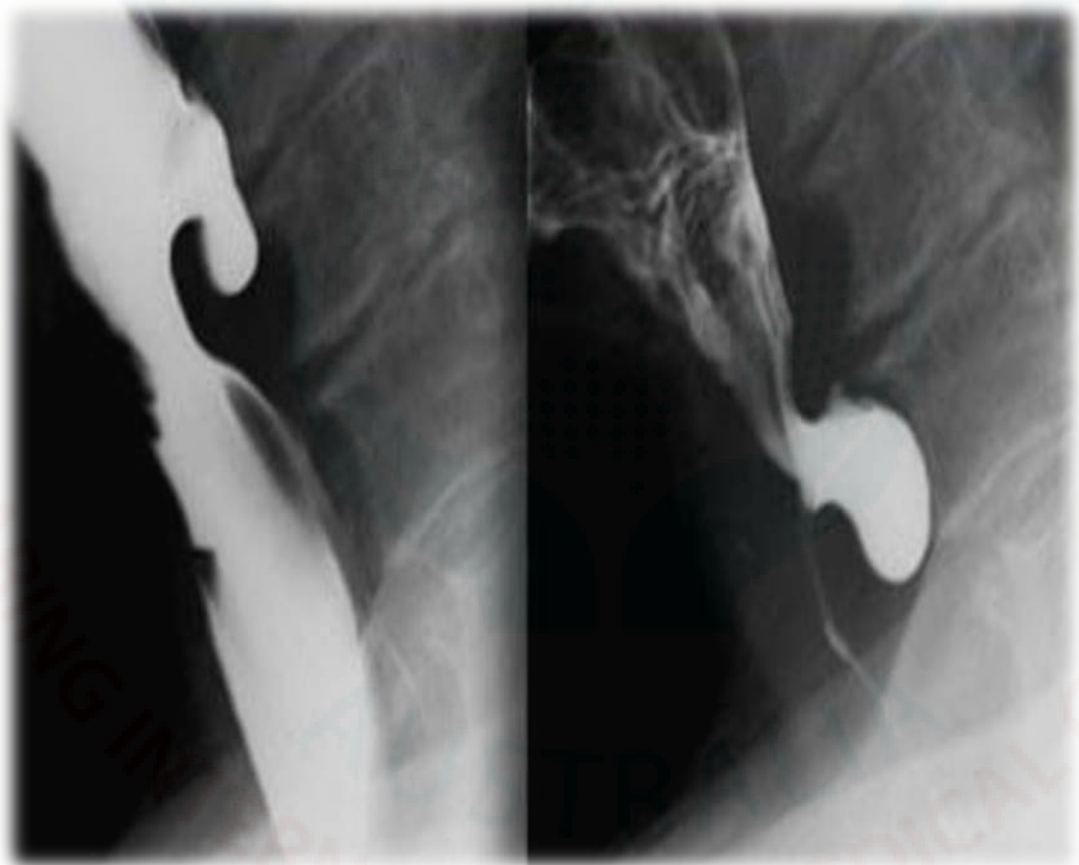
Usually, asymptomatic

If symptomatic

- regurgitate undigested food
- gurgling in the neck
- halitosis
- dysphagia

- Physical exam is usually normal / negative as the protrusion is posterior in direction
- **Management will be surgical for any age group.**





The photograph is one of a barium swallow (showing the upper and mid Oesophagus) that has been performed in a 75-year old man. He presents with symptoms that had been present for 12 months. Which one of the following symptoms would have been the MOST LIKELY mode of presentation?

1. Recurrent chest infection
2. Progressive loss of weight
3. Retrosternal burning sensation
4. Gurgling in the neck
5. Regurgitation of food



The photograph is one of a barium swallow (showing the upper and mid Oesophagus) that has been performed in a 75-year old man. He presents with symptoms that had been present for 12 months. Which one of the following symptoms would have been the MOST LIKELY mode of presentation?

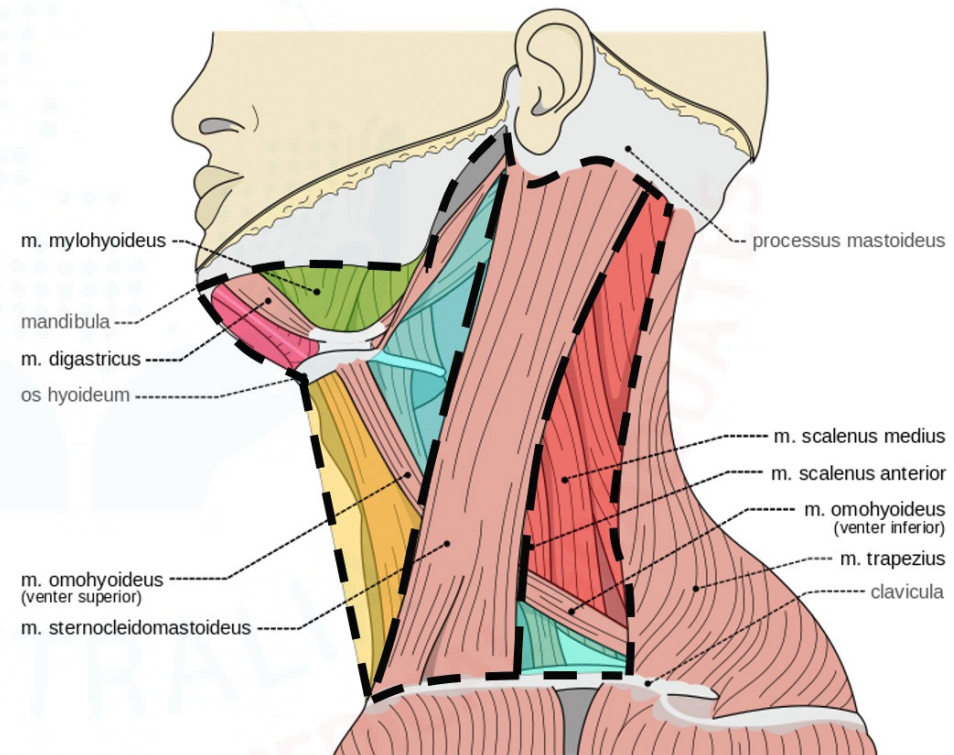
1. Recurrent chest infection
2. Progressive loss of weight
3. Retrosternal burning sensation
4. Gurgling in the neck
5. Regurgitation of food



TRIANGLES OF THE NECK

Neck is divided into two triangles by the sternocleidomastoid muscle.

- Anterior
- Posterior



ANTERIOR TRIANGLE -BCC

Branchial cyst

Carotid body tumour

Carotid aneurysm



BRANCHIAL CYST

Common age group from paediatric to early adulthood

Located anterior to the sternocleidomastoid muscle.

Can get infected and discharge mucopurulent discharge

Symptoms : small swelling in the anterior triangle. Usually nontender and fluctuant. If theres a fistula can leak cystic contents.

Can get enlarged during an upper respiratory infection and become painful and inflamed.

Diagnosis:

➤ Clinical, investigations if done are- **USG-1st**, **CT/MRI- best**

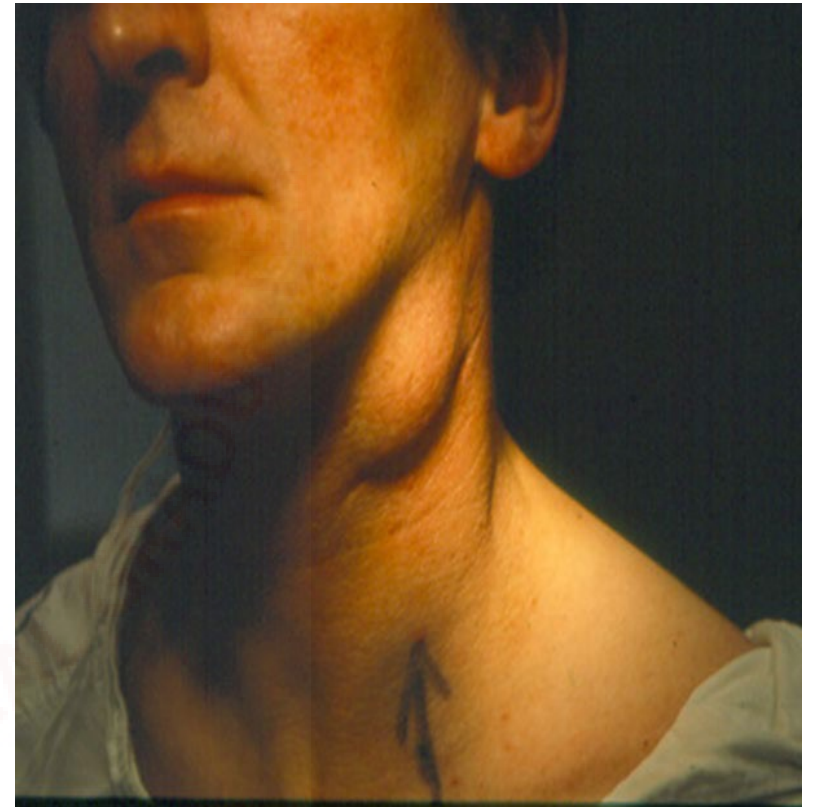
➤ Aspirate includes cholesterol and keratinaceous debris.

■ Management = Referral for excision.

A 32-year-old patient presents with fever and malaise. On examination there is a tender lump anterior to the sternocleidomastoid muscle on the left. The swelling is fluctuant and tender.

What is the most likely diagnosis?

- A. Infected branchial cyst
- B. Infected epidermoid cyst
- C. Lipoma
- D. Cystosarcoma multiplex
- E. Infected thyroglossal cyst

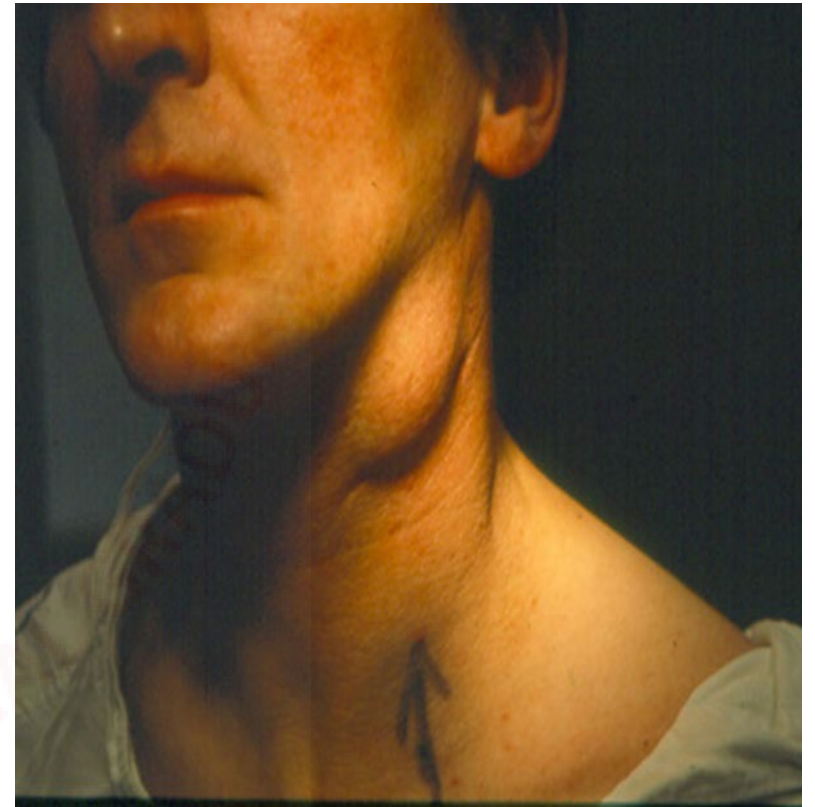


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- C. Lipoma
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- E. Infected thyroglossal cyst

A



CAROTID BODY TUMOR

Carotid body tumor is a rare, usually benign, highly vascular tumor arising from the **carotid body** at the carotid bifurcation.

Usually seen in the age group of 40 – 60 years.

Seen close to the thyroid cartilage.

Pulsatile mass which moves laterally and fixed vertically

Risk factors are chronic hypoxic stimulation and genetic predisposition.

Usually, asymptomatic- can cause compression symptoms.

Can be diagnosed by **USG/MRA**

Usually treated by surgery, transcatheter embolization (**preoperative procedure** sometimes used in **carotid body tumors** to reduce the tumor's blood supply before surgery and then dissected)

POSTERIOR TRIANGLE : CCP

Cystic hygroma

Cervical rib

Pancoast tumor



CYSTIC HYGROMA

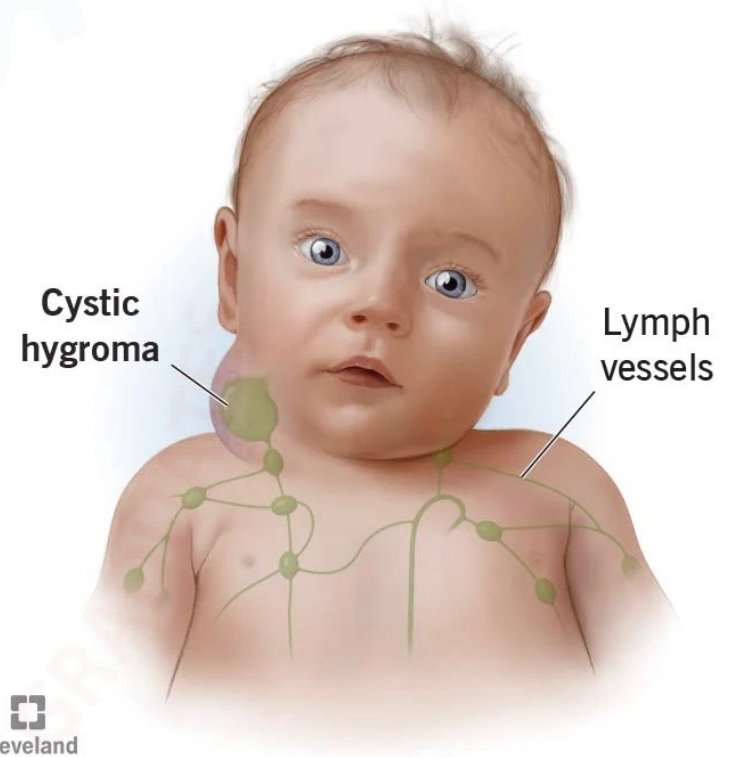
It is a congenital lymphatic cyst in the posterior triangle

It is due to obstruction and malformation of the fetal lymphatic system

Strongly associated with turner's syndrome

Clinically presents as a

- Painless compressible mass
- Difficulty in breathing if the size is huge
- Positive trans illuminative test



CYSTIC HYGROMA (CONTD)

INVESTIGATIONS :

- USG – fluid filled mass without septations
- CT / MRI – to assess for surgical approach

Management :

- Small masses may regress spontaneously
- But surgical excision is advised to prevent further infection or airway compromise (refer to paediatric surgeon)

A three month old baby presents with a swelling on the lateral side of his neck. He is afebrile on examination. The swelling appears to be between the sternocleidomastoid and trapezius muscle. It is trans-illuminable.

What is the most likely diagnosis?

- A. Pancoast tumour
- B. Branchial cyst
- C. Ruptured Baker's cyst
- D. Tuberculous lymph nodes
- E. Cystic hygroma



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What is the most likely diagnosis?

- A. Pancoast tumour
- B. Branchial cyst
- C. Ruptured Baker's cyst
- D. Tuberculous lymph nodes
- E. Cystic hygroma



E

PANCOAST TUMOR

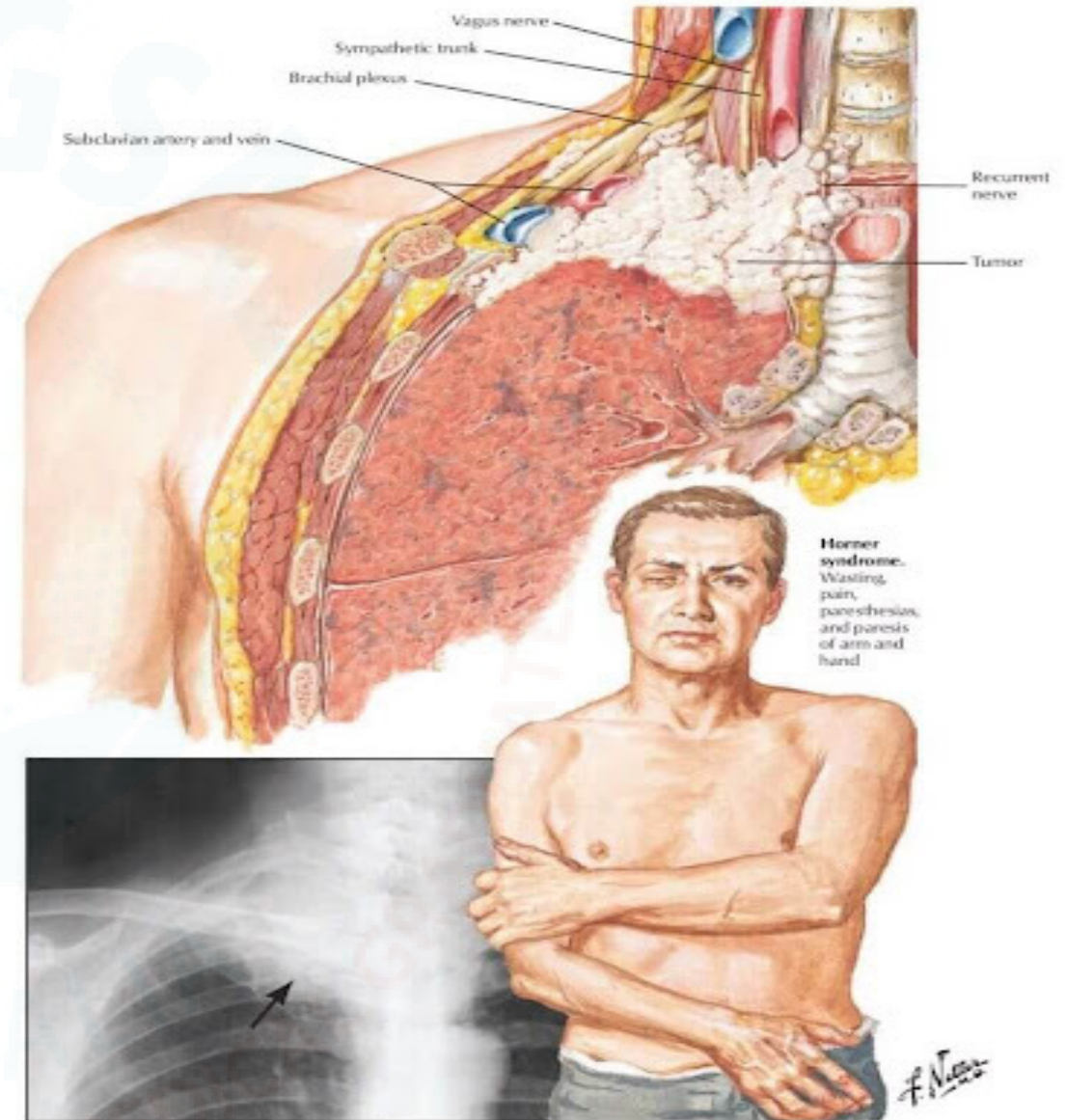
It is tumor of the apex of the lung

Non-small cell cancer of the lung

Can be unilateral / bilateral

Complications of Pancoast tumor:

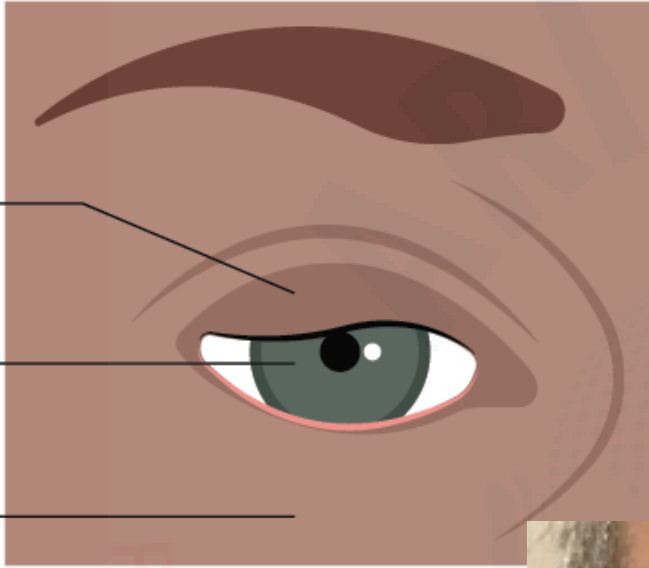
- Brachial plexus compression – shoulder pain radiating down to arm, weakness, sensory loss at little finger)
- **HORNER's SYNDROME** : sympathetic chain compression (ptosis, miosis, anhidrosis)
- Cough : phrenic nerve compression
- Hoarseness : RCL compression



Pancoast tumor. Shown in radiograph (arrow)

HORNER'S SYNDROME

- PTOSIS**
Drooping Eyelids
- MIOSIS**
Constricting pupil
- ANHIDROSIS**
Loss of sweating
on the face



PANCOAST TUMOR-XRAY



MANAGEMENT

Surgery

Radiotherapy if it is life-threatening – can shrink the tumor and then operate

Chemotherapy if surgery is not possible.



MIDLINE MASSES OF THE NECK - TTD

Thyroid nodule

Thyroglossal cyst

Dermoid cyst



THYROGLOSSAL CYST

Fibrous cyst that forms from a persistent thyroglossal duct – **Pediatric** remnant condition.

Irregular neck mass or a lump

The most common cause of midline neck masses and are generally located caudal to the hyoid bone.

Can occur anywhere along the path of the thyroglossal duct, from the base of the tongue to the suprasternal notch.

A thyroglossal cyst will move upwards with protrusion of the tongue

1st –USG.

Mx - Sistrunk operation

Removal of cyst– Removal of **central part of hyoid bone**–
Excision of entire thyroglossal duct tract up to **foramen cecum**.

This prevents recurrence.



A young woman presented with a lump in the midline of the neck. The lump moves upward on tongue protrusion.

What is the most likely diagnosis?

- ☐ a. Thyroid nodule
- ☐ b. Thyroglossal cyst
- ☐ c. Dermoid cyst
- ☐ d. Lymph node
- ☐ e. Branchial cyst

A young woman presented with a lump in the midline of the neck. The lump moves upward on tongue protrusion.

What is the most likely diagnosis?

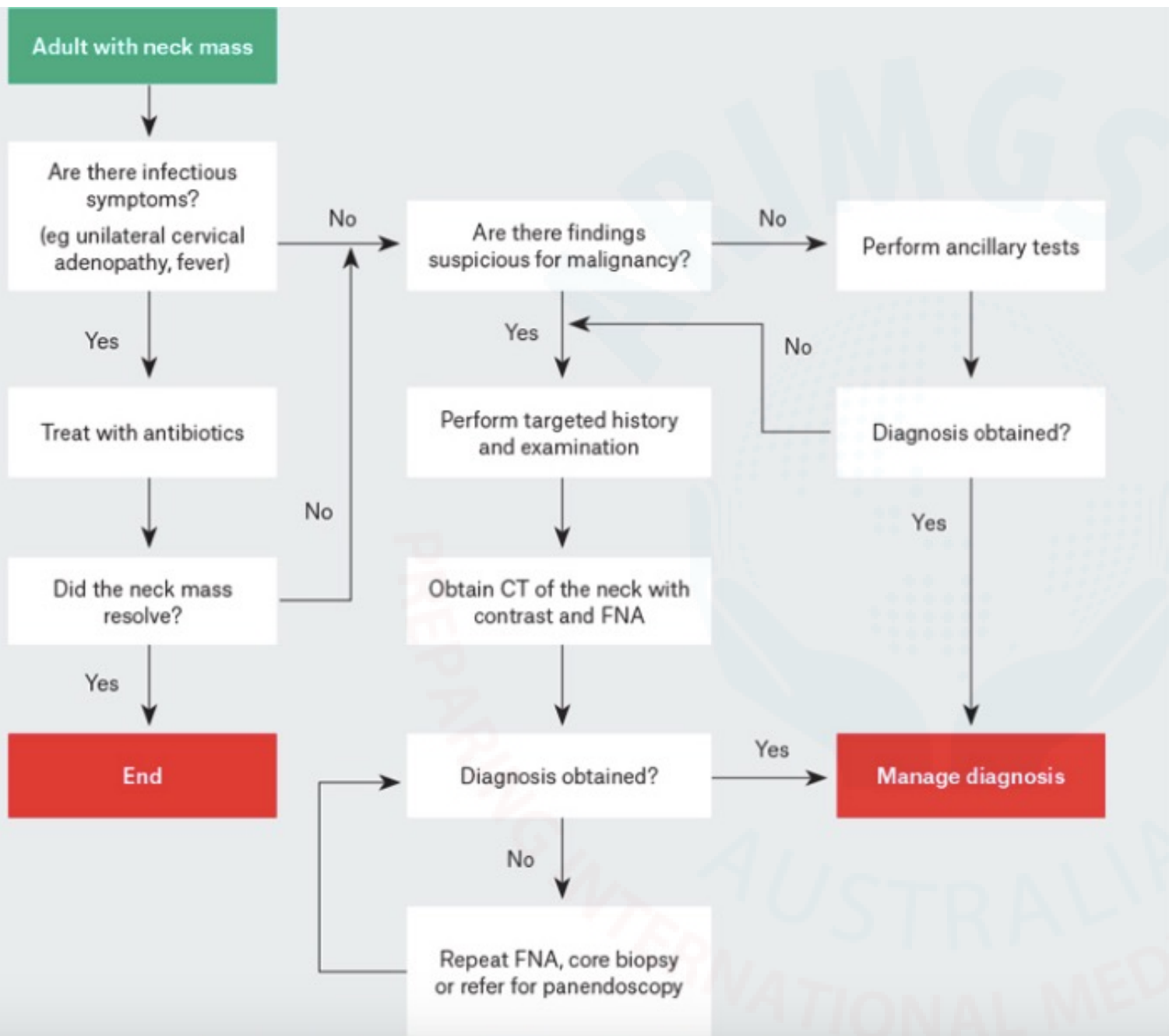
- ☐ a. Thyroid nodule
- ☐ b. Thyroglossal cyst
- ☐ c. Dermoid cyst
- ☐ d. Lymph node
- ☐ e. Branchial cyst

B

DERMOID CYST

- It is a **teratoma** of a cystic nature that contains developmentally mature, solid tissues.
- It frequently consists of skin, hair follicles, and sweat glands, clumps of long hair, pockets of sebum, blood, fat, bone, nail, teeth, eyes, cartilage, and thyroid tissue.
- **Management** includes imaging and surgical resection.





Panendoscopy is a **comprehensive endoscopic examination of the upper aerodigestive tract**, usually performed under general anesthesia.

Ancillary tests are additional (supporting) tests done to help confirm a diagnosis or provide more information. Eg: If a patient has a **neck mass**:

Main step → clinical examination

Ancillary tests →

Ultrasound

FNAC

CT scan

Blood tests

PERIOPERATIVE MANAGEMENT

INSULIN DEPENDENT DIABETES MELLITUS

Minor surgery :-

- Always check Basal blood sugar before surgery
- Withholding eating & regular insulin dose and catching up post-surgery asap.
- Half the regular morning dose of insulin on the day of surgery

Major surgery :-

- Due to the surgical stress the patient will go into hyperglycemia.
- Since it is a major surgery fasting is essential so we cannot give the insulin dose.
- This problem is overcome by setting up an Insulin-glucose pump during the surgery ensuring a tight glycaemic control which will give a better healing phase for the patient as well.

Miss Barker is a 51-year-old female who is admitted for an elective cholecystectomy. Her past medical history is only significant for Type 1 Diabetes Mellitus. She has been fasting from midnight and is first on the operating list today (0900h). Her normal medication regime is long-acting insulin (Lantus) in the morning.

What would be the appropriate preoperative management of this patient's diabetes?

1. Withhold regular insulin, initiate single dose of metformin. Hourly BSL until surgery.
2. Continue normal morning insulin dosing. Hourly BSL until surgery.
3. Withhold all insulin until postoperative period. Hourly BSL until surgery.
4. Continue normal morning insulin dosing and allow a regular breakfast. Hourly BSLs until surgery.
5. Initiate an insulin-glucose infusion prior to induction of anaesthesia. Hourly BSL until surgery.

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ANTI-THROMBOTIC AND ANTIPLAETLET DRUGS

Anticoagulant drugs :

- Warfarin
- Apixaban
- Rivaroxaban
- Dabigatran
- **Newer Anticoagulant medications (NOACS)**
e.g. – **Apixaban, Rivaroxaban, Dabigatran**
differ from Warfarin in that they do not need monitoring. But should be used with caution in patients with decreased renal function & **contraindicated in renal failure.**

Antiplatelet drugs :

- Aspirin
- Clopidogrel
- Ticagrelor
- Prasugrel

WARFARIN AND SURGERY

- **If temporary interruption of warfarin therapy is required, the INR should be less than 1.5 on the day of the procedure, to reduce the risk of bleeding.**
- Check the INR 5 to 7 days before the procedure to determine when to interrupt warfarin therapy:
 - **if INR is 1.5 to 1.9, stop warfarin 3 to 4 days before the procedure.**
 - **if INR is 2 to 3, stop warfarin 5 days before the procedure.**
 - **if INR is more than 3, stop warfarin at least 5 days before the procedure.**
- Recheck the INR within 24 hours of the procedure to ensure it is less than 1.5.
- If the INR remains above 1.5, delay elective procedures if possible.

WARFARIN AND SURGERY

- If bridging therapy is required, use either **subcutaneous low molecular weight heparin (LMWH)** or **intravenous unfractionated heparin (UFH)**.
- **Stop UFH 4 to 6 hours before** the procedure and **stop LMWH at least 12-24 hours before** the procedure. **Prophylactic LMWH- 12 hrs, therapeutic LMWH – 24 hrs.**
- LMWH may need to be stopped earlier in patients with impaired kidney function.
- Post procedure LMWH – started 24 hrs after surgery and warfarin is started 48 hrs after. When INR reaches a therapeutic level of 2-3, we can withdraw heparin and continue warfarin.

NOACS AND SURGERY

- Include dabigatran (a direct thrombin inhibitor) and rivaroxaban and apixaban (factor Xa inhibitors).
- **Stop 1 day before surgery.**
- As NOACs achieve maximum anticoagulant effect within hours of the first dose, there is usually no need for postprocedural bridging therapy.
- Following a procedure with a low post procedural bleeding risk - restart NOAC therapy the day after.
- If there is a moderate or high postprocedural bleeding risk delay NOAC therapy for 2 to 3 days.

ANTIPLAETLETS AND SURGERY

- Always delay the procedure if the therapy is prescribed for Acute coronary syndrome / drug eluting stents.
- But in case of an emergency
 - Clopidogrel needs to be stopped & Aspirin can be continued if the prescribed period is not done.
 - If this continuation of Aspirin is leading to high-risk bleeding, then platelet transfusion can be considered.
- Aspirin can be continued for many surgical procedures except **intracranial and prostatectomy procedures**. (V. imp)

ANTIPLAETLETS AND SURGERY

- Platelet function recovers by around 10% per day following aspirin withdrawal, with full restoration of platelet function after 7 to 10 days.
- Hemostasis can be achieved with as little as 20% of normal platelet function, so if temporary interruption of aspirin is required, it may be enough to stop therapy 2 to 3 days before the procedure.
- If temporary interruption of Clopidogrel / Ticagrelor are required, stop them 5 days before the procedure.
- Restart antiplatelet therapy as soon as possible post-procedurally, ideally within 48 hours.

A 62-year-old male patient is being assessed in the pre-surgical clinic for assessment. He has developed uncomplicated varicose veins and needs surgery.

He developed acute myocardial infarction two months ago and had angiography followed by two drug-eluting stents. He is currently on aspirin and clopidogrel.

Which of the following is the best management in this situation?

- ☐ a. Continue clopidogrel and do surgery
- ☐ b. Do the surgery one year later
- ☐ c. Stop clopidogrel at least two weeks before surgery
- ☐ d. Continue clopidogrel until 24 hours before surgery
- ☐ e. Request the cardiologist to let you stop aspirin and clopidogrel so that you can do surgery

Correct Answer: b. Do the surgery one year later

Answer Detail:

The correct answer is b.

This patient needs a non-cardiac non-emergency surgery for varicose veins.

Perioperative death/MI/stent thrombosis occurs in at least 5% of patients if dual antiplatelet therapy is ceased and non-cardiac surgery performed within 12 months of drug-eluting stents placement.

So an elective surgery should be deferred for 12 months following DES because of a likely increased the risk of death/myocardial infarction/stent thrombosis (Level of Evidence IV, GRADE of recommendation B).

ANTIHYPERTENSIVES AND SURGERY

- Beta blockers can be continued on the day of surgery.
- ACE inhibitors and ARBs must be stopped 24 hours before procedure to prevent hypotension during surgery.



POSTOPERATIVE COMPLICATIONS

POST OP COMPLICATIONS

Highest incidence of post operative complications is within 1-3 days post operatively.

They can be either general or specific to the type of surgery undertaken and should be managed with the patient's history in mind.



IMMEDIATE COMPLICATIONS

- 1° Hemorrhage or Reactionary Hemorrhage
- Basal atelectasis
- Shock
- Decreased urine output (AKI)
- Pulmonary embolism (In high risk surgeries-e.g.cardiothoracic)

EARLY COMPLICATIONS

○ Mild fever $<38^{\circ}\text{C}$

- Tissue damage / hematoma

○ Moderate fever / persistent fever $>38^{\circ}\text{C}$

- Atelectasis

- Blood transfusion Rx

- UTI related to Surgery.

COMPLICATIONS AT 3-5 DAYS

- Pneumonia
- Sepsis
- Wound Infection
- DVT – PE
- Abscess
- Paralytic ileus

LATE COMPLICATIONS

These are usually specific to the surgery

- If bowel Surgery – then anastomotic leak / fistula formation
- Keloid scars
- Incisional hernia
- Bowel obstruction due to fibrosis



A 52-year old patient underwent hemicolectomy for colon cancer 2 days ago. The patient was improving well but now the patient appears confused and the nurses are calling the doctor to see if he is actually delirious.

As the attending doctor, what is the most appropriate next step to consider?

- ☐ a. Pulmonary function test
- ☐ b. Pulse oximetry
- ☐ c. Check serum electrolytes
- ☐ d. Full blood count
- ☐ e. Urine analysis

Correct Answer: b. Pulse oximetry

Answer Detail:

The correct answer is b.

Confusion in a post-surgical patient is common and is often secondary to hypoxia, where chest infection, over-sedation, cardiac problems and pulmonary embolism need to be considered.

So check for oxygen saturation to rule out any hypoxia and consider doing blood gases.

You are called to see a 65 yo previously well female in the ward, who underwent a total abdominal hysterectomy for large fibroids two hours ago and is now complaining of dyspnoea. She is afebrile, tachycardic and tachypnoeic but blood pressure is stable at 110/60.

What post-operative complication to rule out at this early stage?

- A. Hemorrhage
- B. Hospital-acquired pneumonia
- C. Pulmonary embolism
- D. Sepsis – due to UTI
- E. Sepsis secondary to wound infection

-
- A. **Post-operative haemorrhage** is the most important post-operative complication to rule out and treat at this early stage as the patient can progress rapidly to hypovolaemic shock.
 - B. **Post-operative pneumonia** usually occurs 2-5 days after the operation unless there was a pre-existing community acquired pneumonia.
 - C. Usually **DVTs and PEs** develop several days 5-7 days post- operatively.
 - D. **Urinary tract infection** is unlikely to occur until at least day two post-operatively, unless the patient had a pre-existing catheter.
 - E. **Wound infection** is unlikely to occur until at least day five post- operatively

A 43-year-old male undergoes total thyroidectomy for papillary carcinoma of the thyroid. He developed hypoparathyroidism post-thyroidectomy. Which of the following statement is correct regarding post-surgical hypoparathyroidism?

- ☐ a. Hypocalcaemia is always permanent
- ☐ b. It decreases calcium and increases PTH
- ☐ c. Hypocalcaemia is fatal if not treated promptly
- ☐ d. Hypocalcaemia is very uncommon after total thyroidectomy
- ☐ e. Vitamin D supplements are not required usually

Correct Answer: c. Hypocalcaemia is fatal if not treated promptly

Answer Detail:

The correct answer is c.

Hypocalcaemia is seen in patients who undergo total thyroidectomy. Parathyroid glands are removed during the surgical procedure. It results in primary hypoparathyroidism causing low PTH and hypocalcaemia. So option b is incorrect.

Permanent hypoparathyroidism develops in 1-2% of patients after a total thyroidectomy. However transient hypoparathyroidism and hypocalcemia are quite common. So option a is incorrect.

Hypocalcaemia in patients after removal of parathyroid glands is fatal if not treated promptly. Hypocalcemia symptoms begin 12 to 24 h postoperatively and may need treatment with oral or intravenous calcium.

Parathyroid function often returns, but persistent hypocalcaemia requires treatment with vitamin D preparations. So option e is incorrect.

Hypocalcemia can cause laryngospasm, cardiac arrhythmia & seizures.

FACTORS WHICH AFFECT WOUND HEALING

- Poor blood supply.
- Excess suture tension.
- Long-term steroids.
- Immunosuppressive therapy.
- Radiotherapy.
- Severe rheumatoid disease.
- Malnutrition and vitamin deficiency

WOUND DEHISCENCE

- This affects about 1% of midline laparotomy wounds.
- It is a serious complication with a mortality of up to 30%.
- It is due to failure of wound closure .
- It usually **occurs between 7 and 10 days postoperatively**.
- Often, it is associated with **serosanguinous discharge (serum + blood)** from the wound.
- It should be assumed that the defect involves the whole of the wound.
- Initial management includes **opiate analgesia, sterile dressing to the wound, fluid resuscitation** and early return to theatre for re-suture under general anesthesia.

WOUND DEHISCENCE



RESPIRATORY COMPLICATIONS

Respiratory complications occur after major surgery, particularly after general anaesthesia and can include :

- **Atelectasis (alveolar collapse):**

- This is caused when airways become obstructed, usually by bronchial secretions. Most cases are mild and may go unnoticed.
- Symptoms are slow recovery from operations, mild tachypnoea and tachycardia.
- Prevention is by pre-operative and postoperative physiotherapy.
- In severe cases, positive pressure ventilation may be required.

RESPIRATORY COMPLICATIONS

- **Pneumonia:** requires antibiotics, and physiotherapy. Usually, day 3-5 post op.
- **Aspiration pneumonitis:**
 - Up to 4.5% has been reported in adults; higher in children.
 - Sterile inflammation of the lungs from inhaling gastric contents.
 - Presents with a history of vomiting or regurgitation with rapid onset of breathlessness and wheezing.
 - A non-starved patient undergoing emergency surgery is particularly at risk.
 - Mortality is nearly 50% and requires urgent treatment with bronchial suction, positive pressure ventilation, prophylactic antibiotics and IV steroids.
 - **Management : Positive pressure ventilation & urgent bronchial suction , prophylactic antibiotics.**

RESPIRATORY COMPLICATIONS

ACUTE RESPIRATORY DISTRESS SYNDROME :

- Most common causes are
 - Sepsis (most common)
 - Trauma (pulmonary contusion)
 - Aspiration
 - Pneumonia
 - Acute pancreatitis
 - Embolism

○ Clinical features :

- Acute dyspnoea
- Tachypnoea & tachycardia
- Cyanosis
- Diffuse crackles
- Fever, cough and chest pain

BERLIN CRITERIA FOR ARDS

Most commonly used & all the four of them must be met.

- Acute onset
- Bilateral opacities on chest xray
- Hypoxemia
- Respiratory failure

MANAGEMENT

It requires intensive care with mechanical ventilation with positive end pressure.

Treat the root cause / causative of the ARDS.



A 59-year old male undergoes a surgical procedure and 8 hours later, his chest X-ray shows atelectasis. Physiotherapy is advised along with incentive spirometry and deep breathing exercises. This has not helped much and patient remained hypoxic.

What will you do next?

- ☐ a. Antibiotics
- ☐ b. CT pulmonary angiogram
- ☐ c. Sputum examination
- ☐ d. Request for bronchoscopy and continuous positive airway pressure ventilation
- ☐ e. Continue physiotherapy as it may help latter

Correct Answer: d. Request for bronchoscopy and continuous positive airway pressure ventilation

Answer Detail:

The correct answer is d.

Atelectasis is a collapse of lung tissue with loss of volume. Patients may have dyspnea or respiratory failure if atelectasis is extensive. They may also develop pneumonia.

Pleuritic chest pain may be present with certain causes of atelectasis.

Thoracic and abdominal surgeries are very common causes because they involve general anaesthesia, opioid use (with possible secondary respiratory depression), and often painful respiration.

Diagnosis is by chest x-ray.

Treatment includes chest physiotherapy with incentive spirometry and deep breathing exercises. If this does not help, there may be blockage of the airway with large mucous plug.

Bronchoscopy is needed in severe cases of atelectasis. While waiting for bronchoscopy patient should be on continuous positive airway pressure ventilation.

While waiting for bronchoscopy patient should be on continuous positive airway pressure ventilation. Antibiotics are not needed until there is a strong suspicion of a chest infection.

You are a resident in a busy surgical ward. You are called by the nurse to see a 50-year-old male patient who had cholecystectomy one hour ago.

The nurse is concerned about the patient respiratory rate of 9/min. All other observations are within normal range. During the assessment, you note that patient has pinpoint pupils bilaterally and GCS 15/15.

All of the followings are causes of pin point pupil except?

- ☐ a. Structural lesion in pons
- ☐ b. Organophosphates
- ☐ c. Haloperidol
- ☐ d. Barbiturates
- ☐ e. Clonidine

Correct Answer: c. Haloperidol

Answer Detail:

The correct answer is c.

The patient had a major surgery an hour ago, and it is likely that his slow breathing and pinpoint pupils are due to opioids and barbiturates.

Causes of pinpoint pupils include:

- 1- Structural pons disease.
- 2- Opiates such as heroin and morphine
- 3- Barbiturates.
- 4- Organophosphates.
- 5- Clonidine.
- 6-Pilocarpine eye drops-para-sympathomimetic alkaloid.

Haloperidol is anti-psychotic medication and does not cause pinpoint pupils, rather it causes mydriasis according to Australian Hand Book of Medicines.

COMPLICATIONS OF BOWEL SURGERY

Delayed return of function:

- **Temporary disruption of peristalsis:** the patient may complain of nausea, anorexia and vomiting and it usually appears with the re-introduction of fluids: **ileus – management is conservative (NPO, IV fluid therapy, electrolyte correction, analgesics if painful)**
- The more prolonged extensive form with vomiting and intolerance to oral intake is called **adynamic obstruction** and needs to be distinguished from mechanical obstruction. It involves the large bowel and is usually described as **pseudo-obstruction – management here will be NG tube insertion, IV fluids, bowel rest, If no improvement in 48 hours can give Neostigmine.**
- **Anastomotic leakage or breakdown:** small leaks are common, causing small localised abscesses with delayed recovery of bowel function.
- It is often diagnosed late in the postoperative period. It usually resolves with IV fluids and delayed oral intake but may need surgery and may need antibiotics as well.
- Major breakdown causes generalised peritonitis and progressive sepsis needing surgery for peritoneal toilet and antibiotics. A local abscess can develop into a fistula.

A 65 yo woman had a laparotomy for resection of bowel cancer seven days ago. Today you notice a pinkish discharge leaking from the wound. His pulse rate is 120/min and bp 90/60mmHg. Her abdomen is acutely tender to palpation.

Which one of the following is the most appropriate next step in Mx?

1. Secure IV access, administer IV fluids and Oxygen
2. Arrange surgical review
3. Prescribe IV metronidazole and amoxicyllin
4. Allow the wound to break down and heal by secondary intention
5. Take a wound swab and arrange regular dressing

A 65 yo woman had a laparotomy for resection of bowel cancer seven days ago. Today you notice a **pinkish discharge leaking from the wound**. His pulse rate is 120/min and bp **90/60mmHg**. Her abdomen is acutely tender to palpation.

Which one of the following is the most appropriate next step in Mx?

1. Secure IV access, administer IV fluids and Oxygen (**wound dehiscence**)
2. Arrange surgical review
3. Prescribe IV metronidazole and amoxicillin
4. Allow the wound to break down and heal by secondary intention
5. Take a wound swab and arrange regular dressing

An 80 yo man who lives in a nursing home presents with vomiting, confusion and temperature of 38.5C. He is temporarily immobile following a hip replacement and has an indwelling catheter in situ. He occasionally has difficulty with his bowels and requires regular laxatives as needed. He is prescribed NTG patches for angina, ramipril for HT and metformin and gliclazide for diabetes.

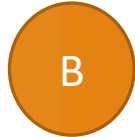
Which one of the following is the most appropriate next step in management?

- A- Obtain a urine culture commence antibiotics and consider changing the catheter
- B- Obtain a urine culture, arrange a hospital admission for IV antibiotics and consider changing the catheter
- C- Change the catheter only
- D- Obtain a urine culture and await the result
- E- Commence a SC infusion of morphine

An 80 yo man who lives in a nursing home presents with vomiting, confusion and temperature of 38.5C. He is temporarily immobile following a hip replacement and has an indwelling catheter in situ. He occasionally has difficulty with his bowels and requires regular laxatives as needed. He is prescribed NTG patches for angina, ramipril for HT and metformin and glicazide for diabetes.

Which one of the following is the most appropriate next step in management?

- A- Obtain a urine culture commence antibiotics and consider changing the catheter
- B- **Obtain a urine culture, arrange a hospital admission for IV antibiotics and consider changing the catheter (already in urosepsis)**
- C- Change the catheter only
- D- Obtain a urine culture and await the result
- E- Commence a SC infusion of morphine

B

**TRUST
YOURSELF.
YOU KNOW
MORE THAN
YOU THINK
YOU DO.**

—DR. SPOCK—

“
GOOD LUCK—
I'M SURE YOU'LL
DO GREAT!
”

Arigatou
CHOKRANE
Kiitos
Dankie
Aitahu
ASANTE
Toda
MAAKE
Ca'm on
Khop Khun Krab
Jerejef
THANK
YOU
MERC
DANKE
OBRIGATO
GRAZIE
GRACIAS
Hvala
Vinaka
Diolch
Efcharisto
Mahalo
Asante
Asante
Maita Henyu
Shukriya
Xie xie
Spasibo
Achiu
Terima Kasih
THANKS
Salamat
Kamsa hamnida
Shukran
Dikuji
Do je
KIA ORA
Gratia
Spasibo
ARIGATO