RADIOLOGY

TEAM 435

GIT AND HEPATOBILIARY IMAGING INTERACTIVE LECTURE

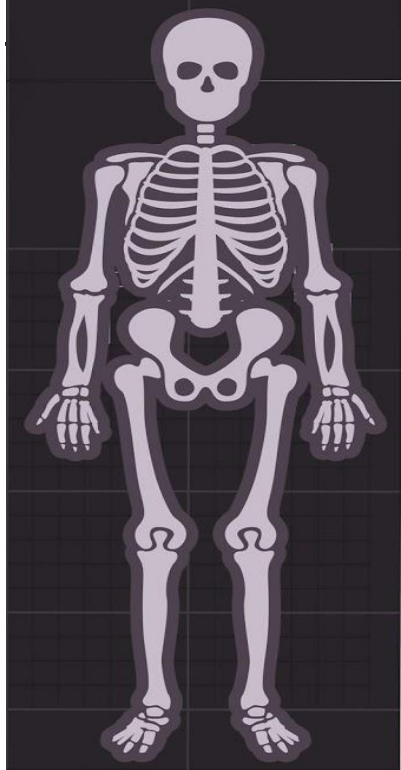
- **Done By:**
- Samar AlOtaibi

- **Team Leaders:**
- Amjad Alduhaish
- Mohammed Alsahil

- **Revised By:**

- **Resources:**
- Diagnostic imaging book.(☀)
- Team 434
- 435 notes

[Editing file | Feedback | Share your notes | Shared notes]



1st Q:

Name 5 radiological modalities:

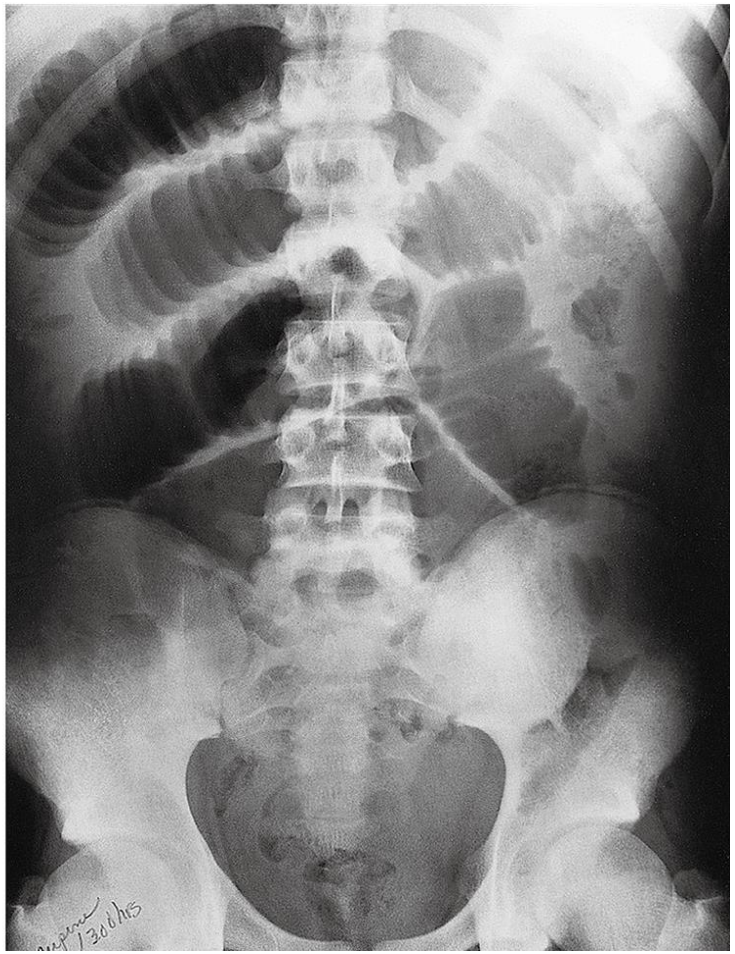
1) **X-RAY**
2) **Fluoroscopy**
3) **U/S**
4) **MRI**
5) **CT scan**
6) **Nuclear Medicine**
7) **Angiography**

Main first 5, less likely to use last 2 in GI and hepatobiliary

Case 1

❖ **Questions:**

- ❑ **What is the modality?**
- ❑ **Mention 2 abnormalities?**



Case 1

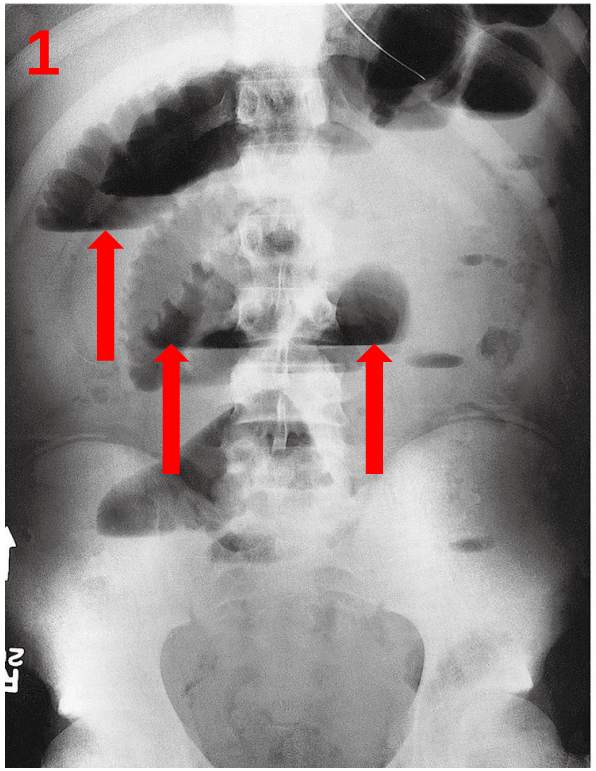
❖ **Answers:**

❑ What is the modality?

Plain X-RAYS**.** No contrast unlike fluoroscopy.

❑ Mention 2 abnormalities?

Multiple air-Fluid levels and Stack of coins signs**.**



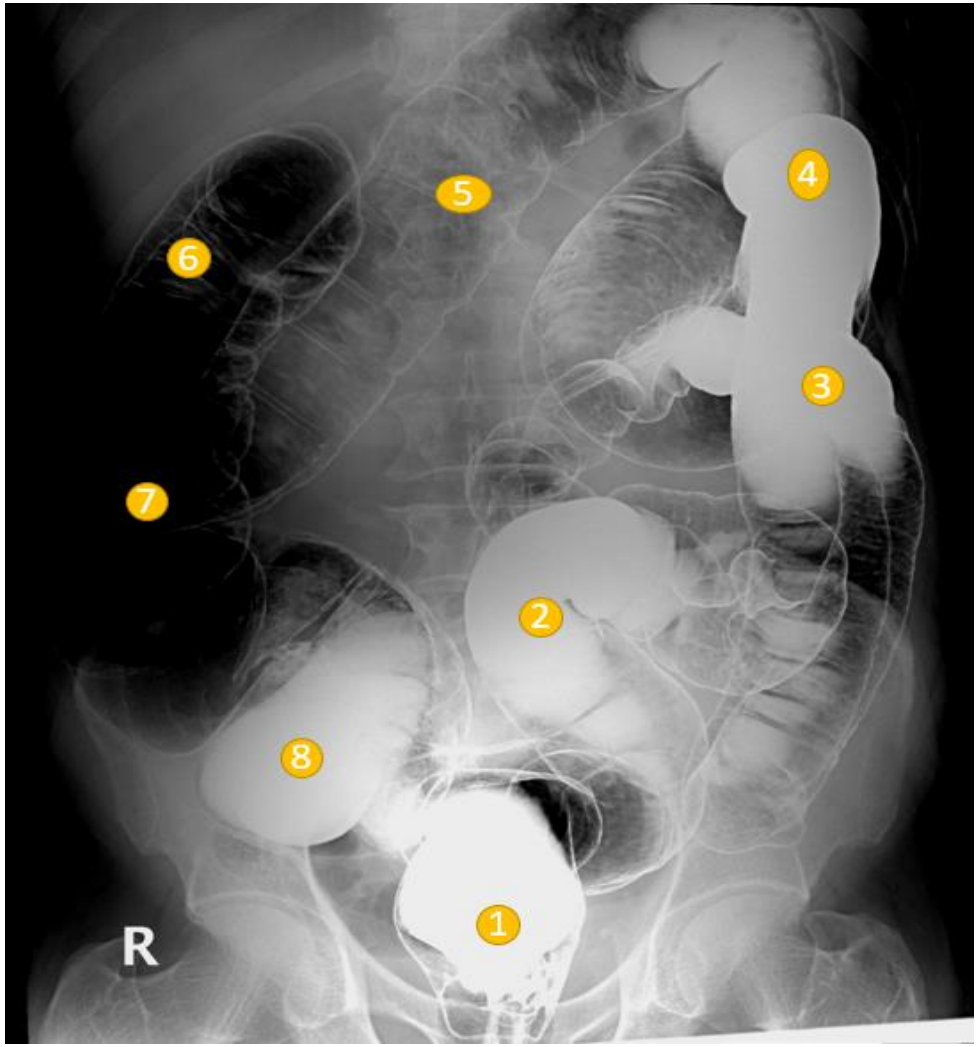
Notes:

- **Image1"Erect film"** In case of multiple air fluid level (arrows) it's sign of obstruction due to adhesions. Increase diameter of small bowel (dilation) "normal 2.5cm"
- **Image2 "Supine film"**: dilatation and thickened wall, stack of coins sign indicate thickening of small bowel convinces "inflammation of the wall". Can happen with bowel obstruction.
- Notes the large bowel contains less gas then normal.

Case 2

❖ **Questions:**

- ❑ **What is the name of the study?**
- ❑ **Name the labelled structures?**



Case 2

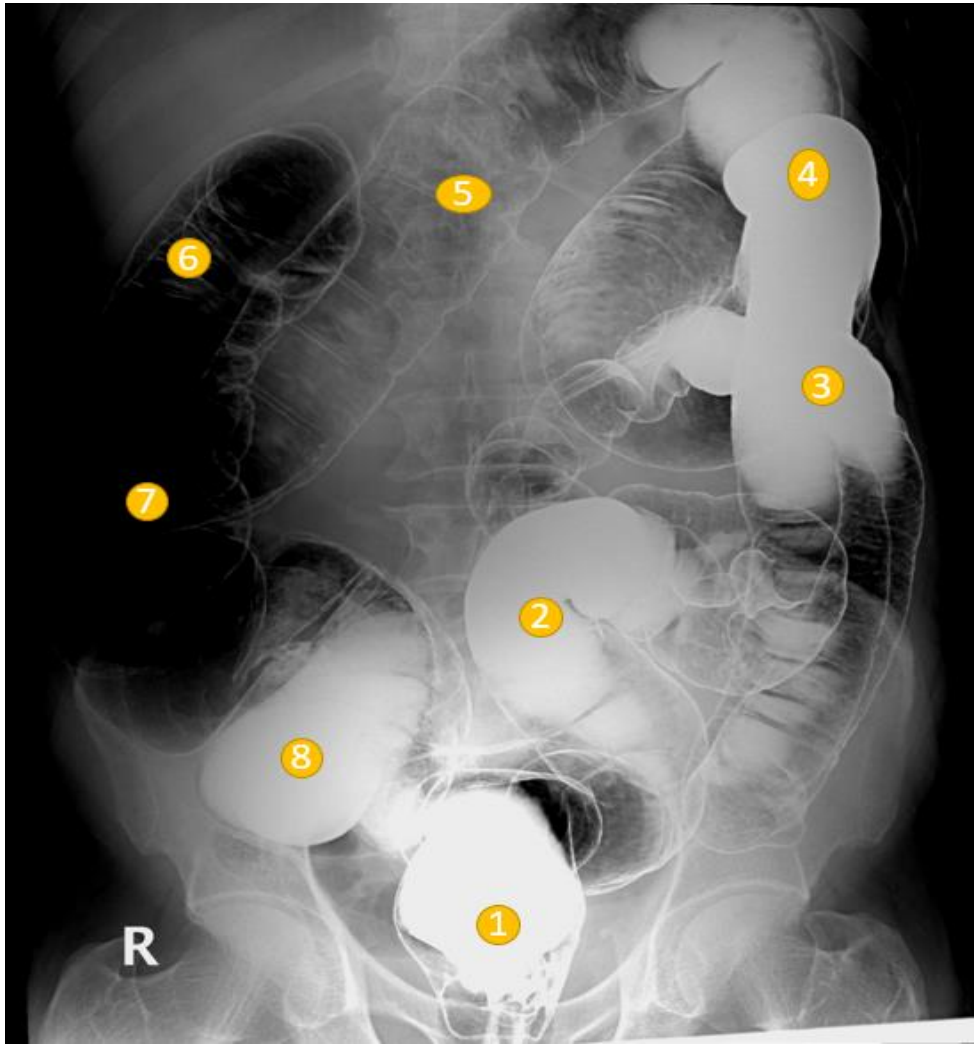
❖ **Answers:**

❑ **What is the name of the study?**

Double contrast barium enema.

❑ **Name the labelled structures?**

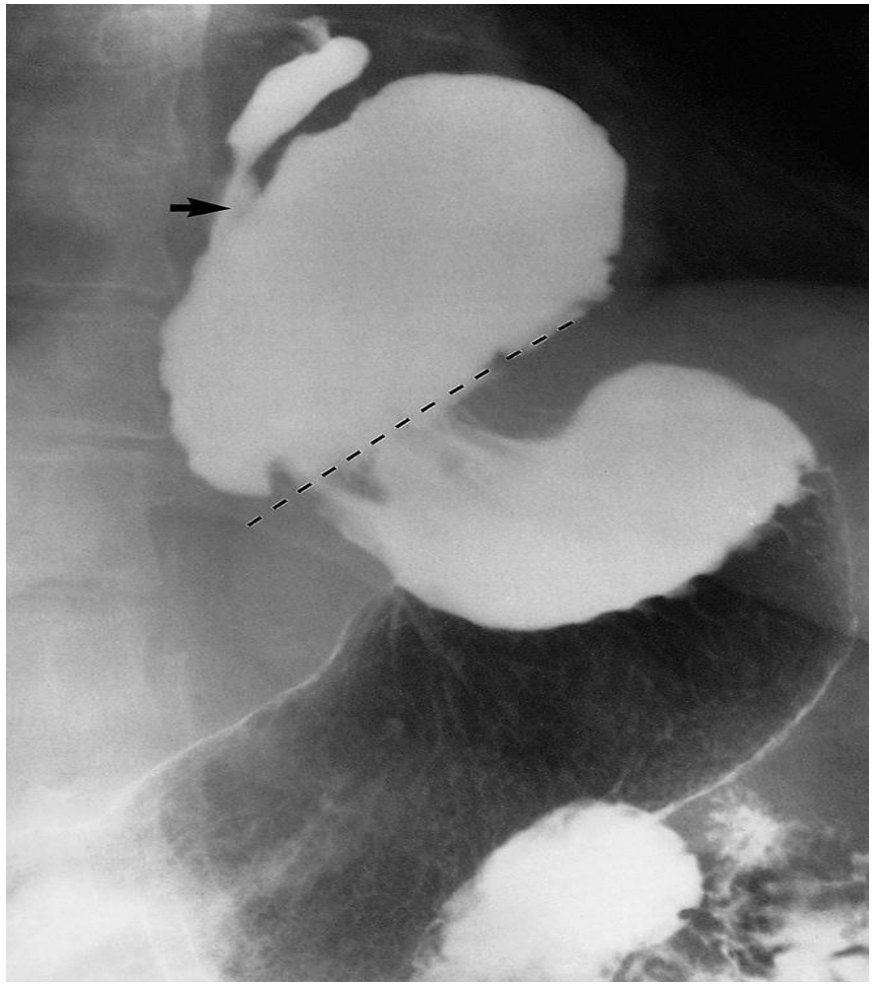
1. Rectum
2. Sigmoid colon
3. Descending colon
4. Splenic flexure
5. Transverse colon
6. Hepatic flexure
7. Ascending colon
8. cecum



Barium enema it has two types:
1- single contrast barium enema. (No air)
2- double contrast barium enema. (Air & fluid) If you see clear bowel wall with gas it's double as in this image.

Case 3

- **Questions:**
  - **What is the modality?**
  - **What is the diagnosis?**



Case 3

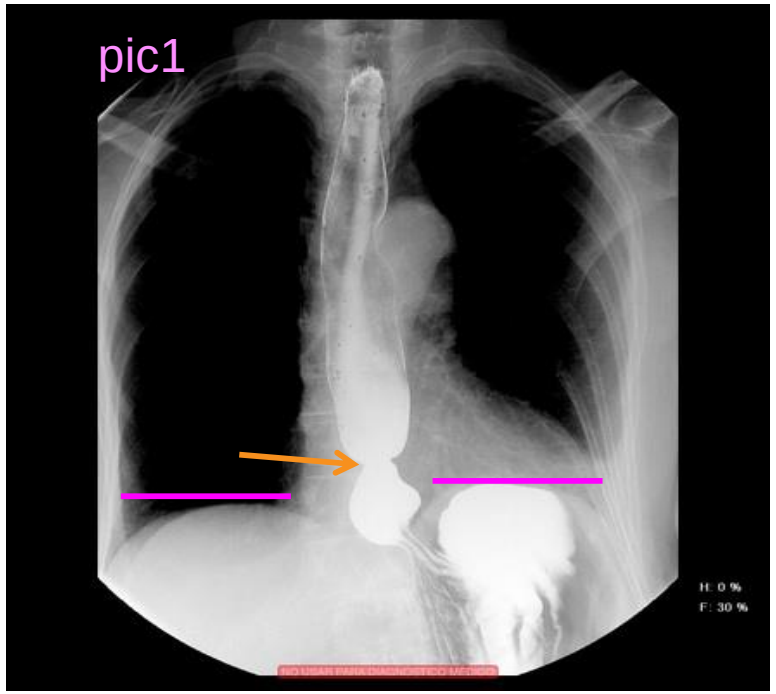
❖ **Answers:**

❑ **What is the modality?**

Barium meal – fluoroscopy**.**

❑ **What is the diagnosis?**

Hiatus hernia.



Notes:

➢ How do we know it's Hiatus hernia?

b/c we see pouch " fundus of stomach" above diaphragm which act normally as sphincter, and causes stenosis in this case!

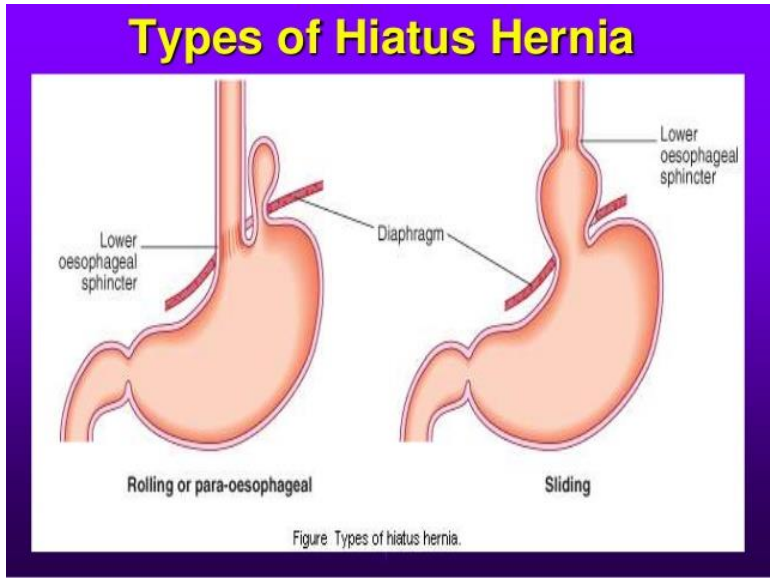
- **Lower esophageal sphincter (Arrow)**

Two main types of hiatus hernia exist:

- Sliding **"Commonest"**
- Rolling. An alternative name for a rolling hernia is 'para-oesophageal'

The lower esophageal sphincter normally will be on **the line with diaphragm**

But in pic1 not > sliding hernia



Case 4

❖ **Questions:**

- ❑ **What is the modality?**
- ❑ **What is the name of the sign?**
- ❑ **What is the diagnosis?**

Case 4

❖ **Answers:**

❑ **What is the modality?**

Single contrast Barium enema – fluoroscopy.

Single b/c we don't see the wall of bowel nor gases as the previous one , it's only contrast.

❑ **What is the name of the sign?**

Lead pipe sign.

(**loss of bowel haustra sign**) it's important b/c UC predisposing to colon cancer. Reflux into the ileum through an incompetent ileocaecal valve has occurred.

❑ **What is the diagnosis?**

IBD – Ulcerative colitis. "Mainly"

Another example of lead pipe colon (**featureless colon**)

3D CT

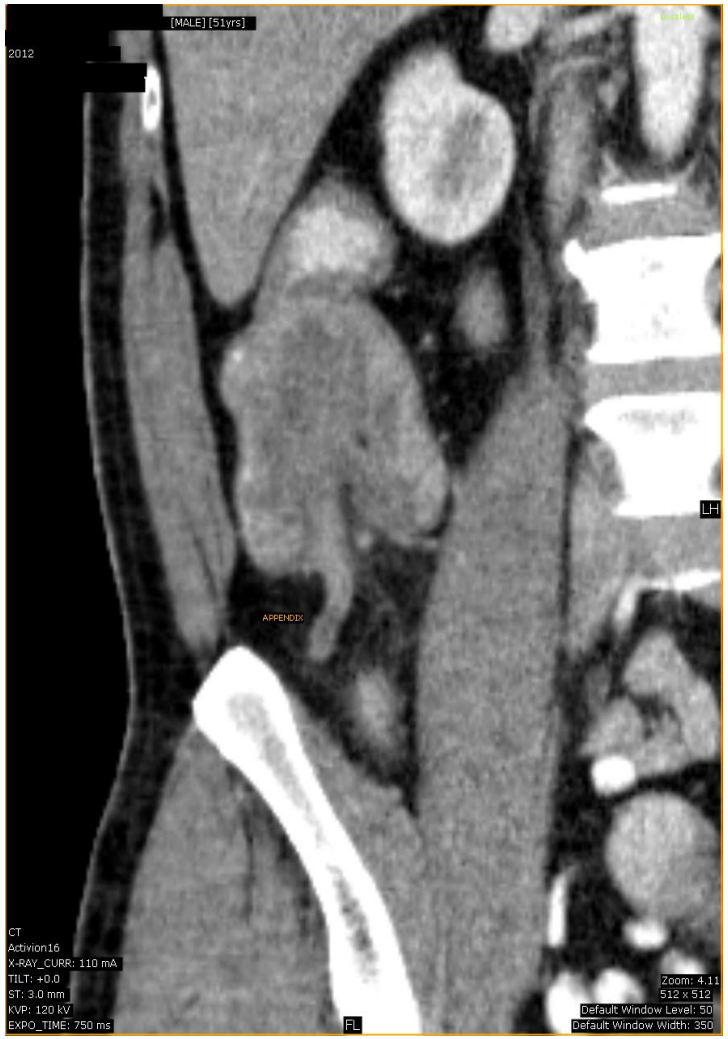
Normally: Haustra can usually be recognized in the whole of the colon, although they may be absent in the descending and sigmoid regions. The outline of the descending colon, apart from the haustra, is smooth.

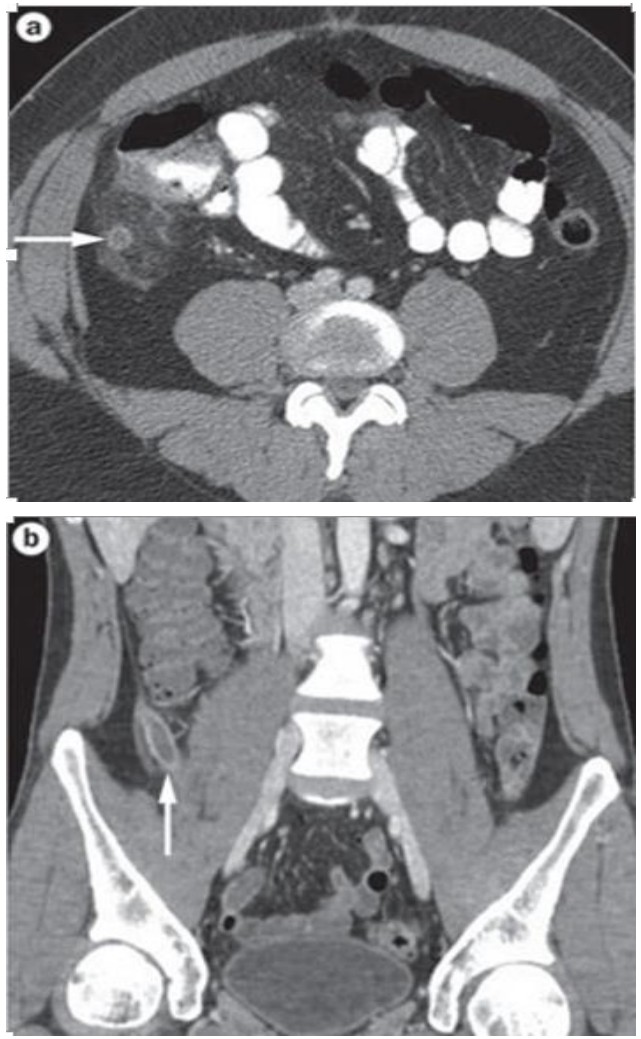
Lead pipe

Case 5

❖ **Questions:**

- ❑ **What is the name of the study?**
- ❑ **What is structure labeled on the left image?**
- ❑ **What is the diagnosis of the patient on right image?**
- ❑ **What is the gold standard image modality for such diagnosis?**
- ❑ **What is the alternative image modality in pregnant/pediatric patients?**





Case 5

Hyper-attenuate fat surrounding mean there's inflammation
Like here in peri-appendix fat

❖ **Answers:**

- ❑ **What is the name of the study? CT scan**
- ❑ **What is structure labeled on the left image? Appendix** (retrocecal appendix)

Is it normal or abnormal? Abnormal b/c diameter enlarged, inflamed appendix (**Hyper-attenuated** means high density which is sign of inflammation)

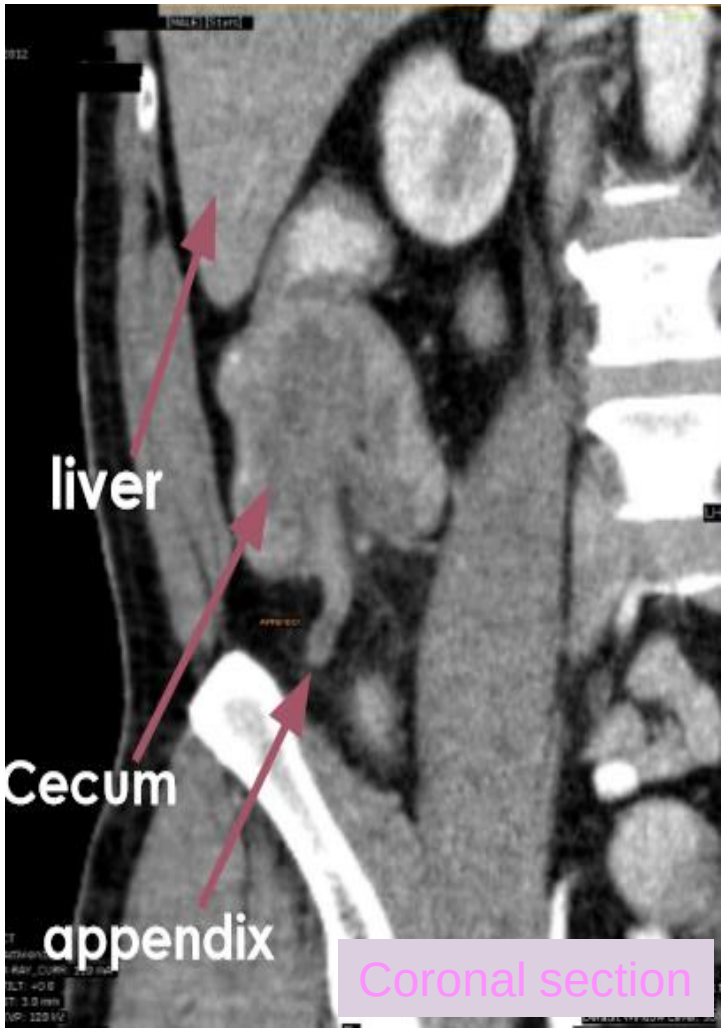
- ❑ **What is the diagnosis of the patient on right image? Simple appendicitis.**

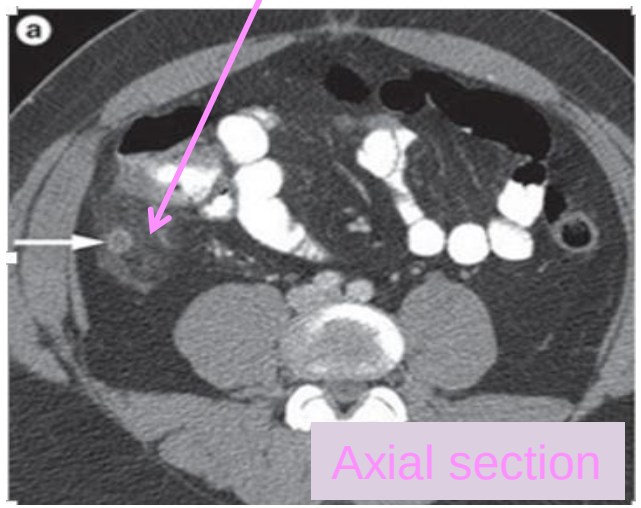
(no complications such as abscess, perforation or air in peritoneum)

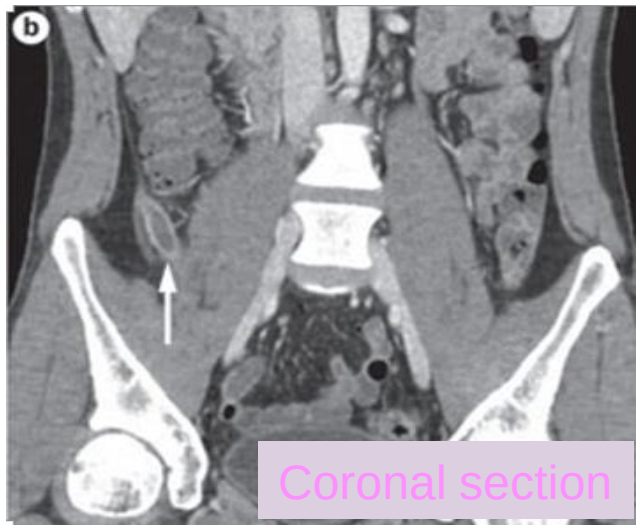
- ❑ **What is the gold standard image modality for such diagnosis? What is the alternative image modality in pregnant/pediatric patients?**

CT scan+contrast **is the gold standard, U/S is the alternative.**

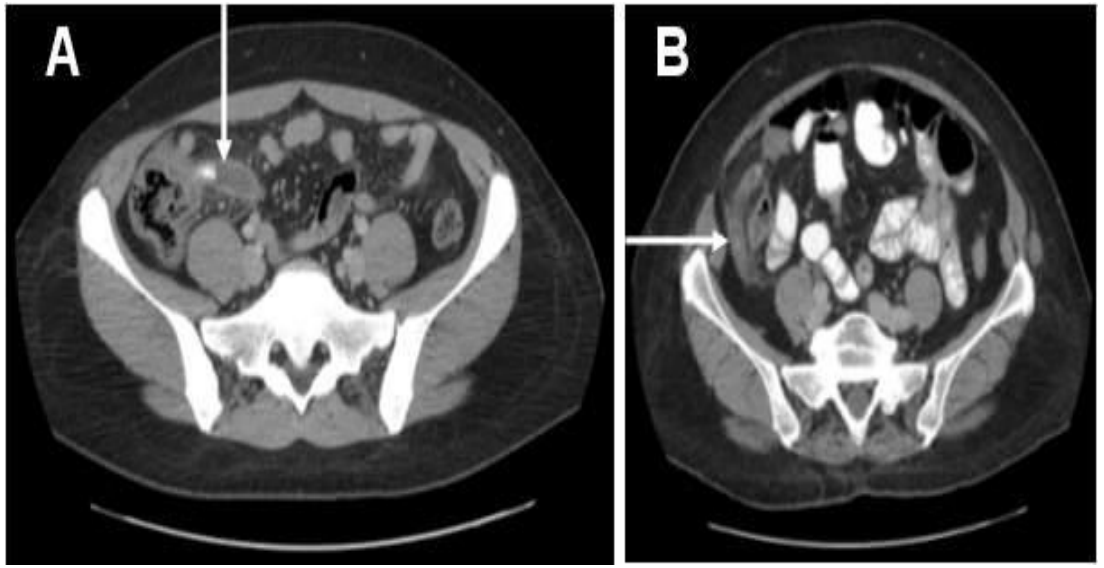
US for pediatric & pregnant







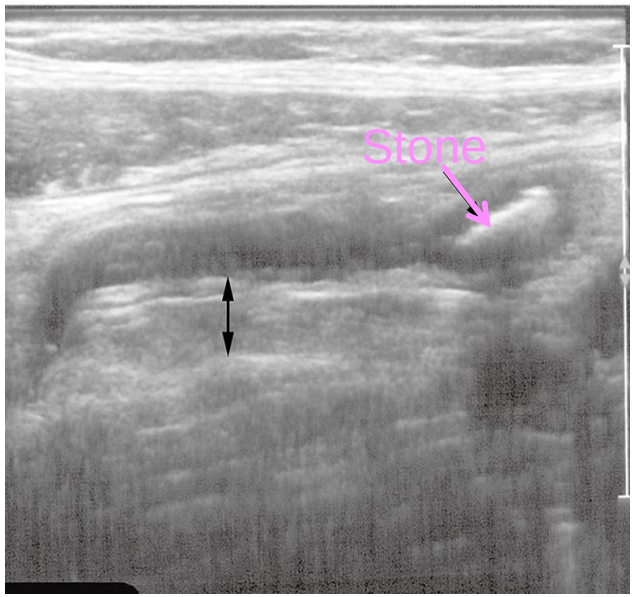
Case 5

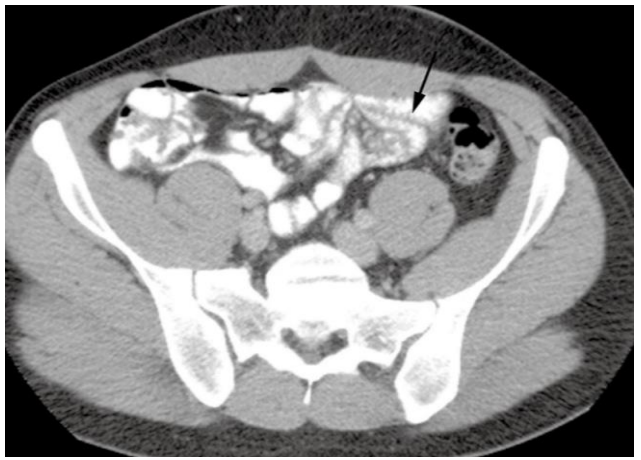


- CT scan. Iliac bone> this section in the pelvis.
- Stone of appendix (**appendicolith**) impacted in the base of appendix -> obstruction of lymphatic drainage -> inflammation.
- (not all appendicitis because of stone)

- Descending colon.
- Cecum (RLQ)> there is something protruded either it's terminal ileum (if reach to small bowel) or appendix (blind ended). "6-7 mm diameter appendix"

- ❑ Appendix normally is **compressible** by U/S probe.
- ❑ Normally, there will be no **appendiculith**.(stone in appendix)
- ❑ Appendix should not exceed **6mm** in diameter.
  - Tubular obstruction Hypoechoic or anechoic.
  - And hyperechoic stone with acoustic shadow.
  - This is **appendicolith** (Right Arrow)
  - A double-headed arrow again indicates thickening of the appendix wall.
- ❑ On CT Scan the surrounding fat should be **clear**.
- ❑ Appendix shouldn't exceed **6mm** in diameter





Case 6

- **Questions:**

- **What is the name of the study?**
- **What is the pertinent sign?**
- **What is the diagnosis?**

Case 6

❖ **Answers:**

❑ **What is the name of the study?**

Double contrast Barium enema.

❑ **What is the pertinent sign?**

Apple-core sign

❑ **What is the diagnosis?**

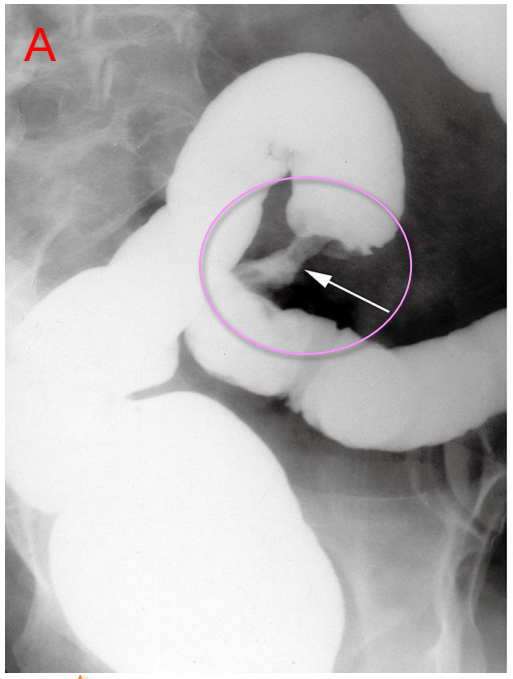
Colon cancer

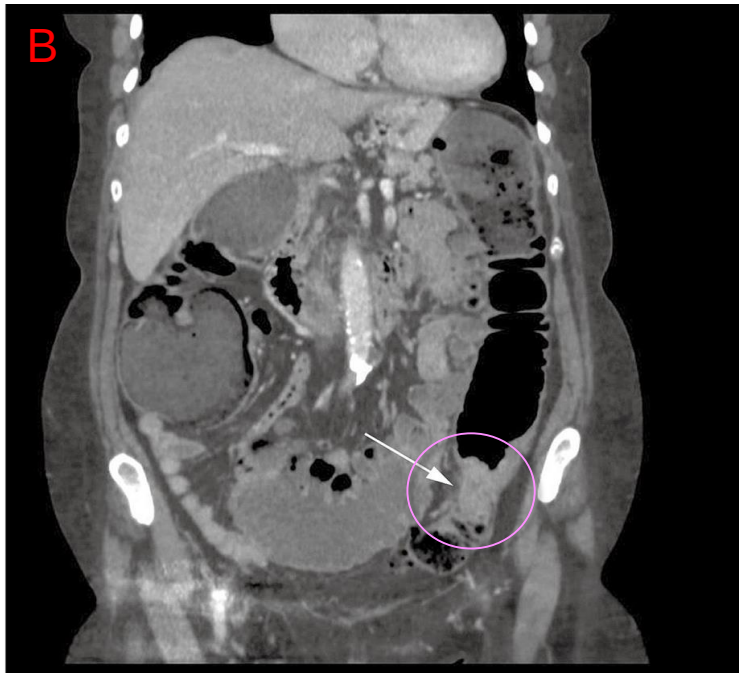
Notes:

- **Neoplastic strictures** have shouldered edges, an irregular lumen and are rarely more than 6cm in length.
- **Benign strictures** classically have tapered ends, a relatively smooth outline and may be of any length.

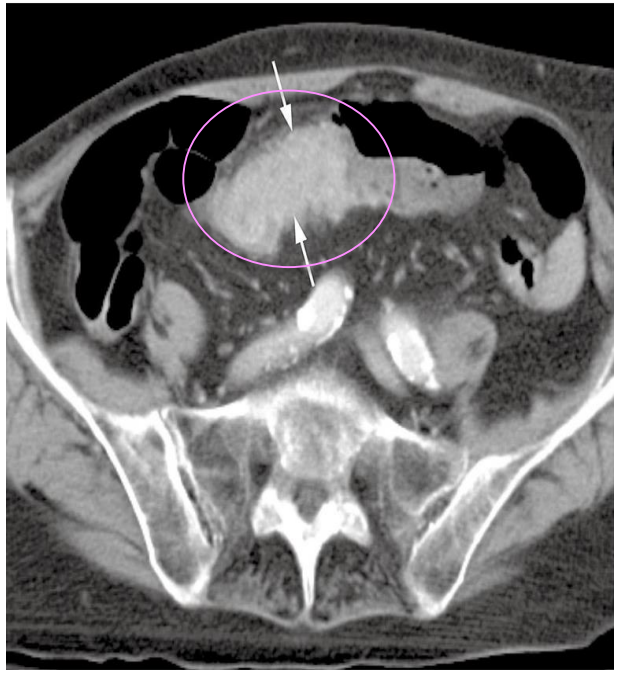
Case 6

Examples of colon cancer in barium enema and CT scan





Stricture. (**a**) Barium enema and **(b**) coronal CT showing a short, circumferential narrowing in the sigmoid colon (arrows) from a carcinoma.



Standard axial CT acquired on thin sections showing a tumor (arrows) in the transverse colon..

Case 7

❖ **Questions:**

- ❑ **What is the name of the modality?**
- ❑ **What is the diagnosis?**
- ❑ **What are the expected symptoms the patient has?**

Case 7

❖ **Answers:**

❑ **What is the name of the modality?**

Ultrasound

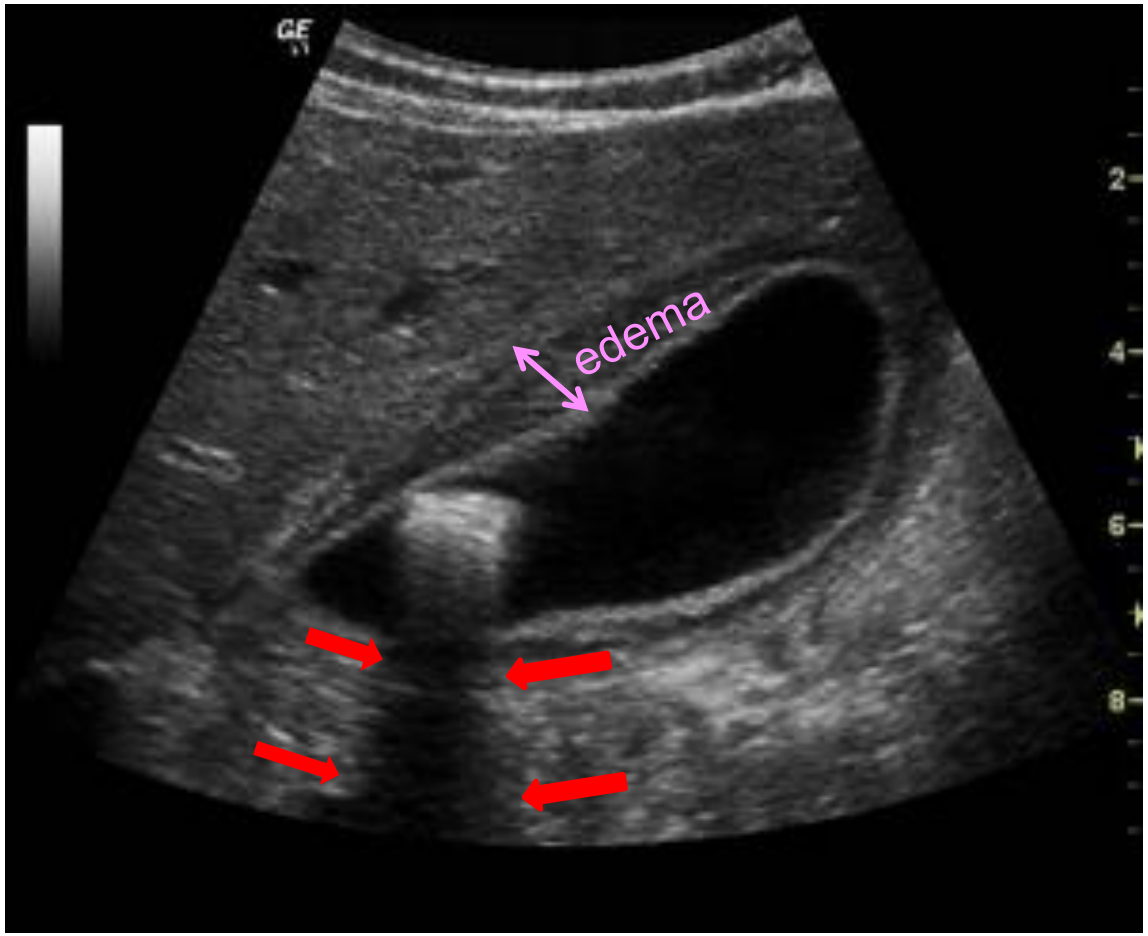
❑ **What is the diagnosis?**

Gallstone with cholecystitis

❑ **What are the expected symptoms the patient has?**

RUQ pain radiating to right shoulder aggravating by fatty meal

- We have hyperechoic lesion and acoustic shadow BLACK We know if it is cholecystitis if there is thickening of the wall and edematous It is "Calculus cholecystitis"



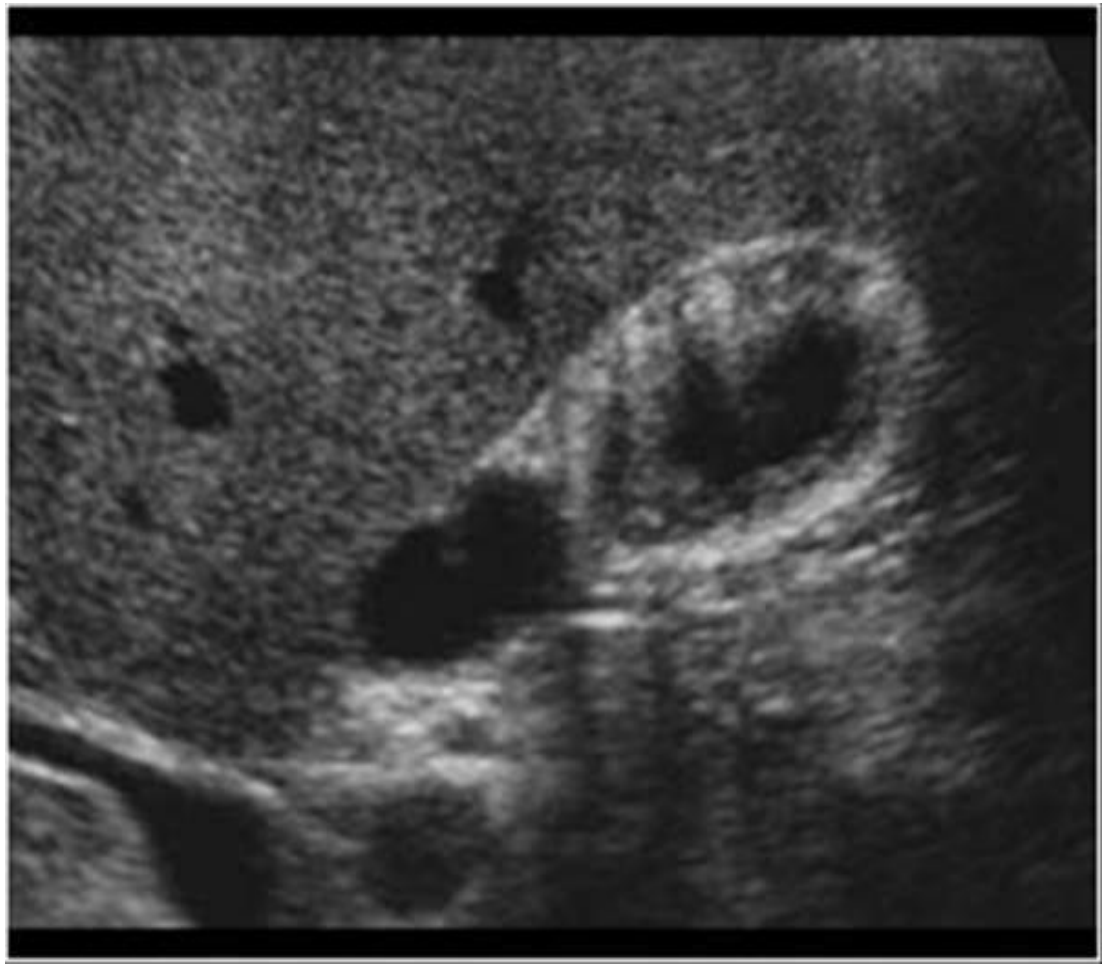
Notes:

- Calcified sludge within the gall bladder is also known as **'milk of calcium' bile.**
- The presence of an **acoustic shadow "Arrows"** is an important diagnostic feature for confirming stones.
- Acoustic shadowing is not seen with polyps.

Case 8

❖ **Questions:**

- ❑ **What is the name of the modality?**
- ❑ **What is the findings?**
- ❑ **What is the diagnosis?**
- ❑ **What is the important of this disease?**



Case 8

❖ **Answers:**

❑ **What is the name of the modality?**

Ultrasound

❑ **What is the findings?**

Hyperechoic lesions within the wall

❑ **What is the diagnosis?**

Gallbladder adenomyomatosis

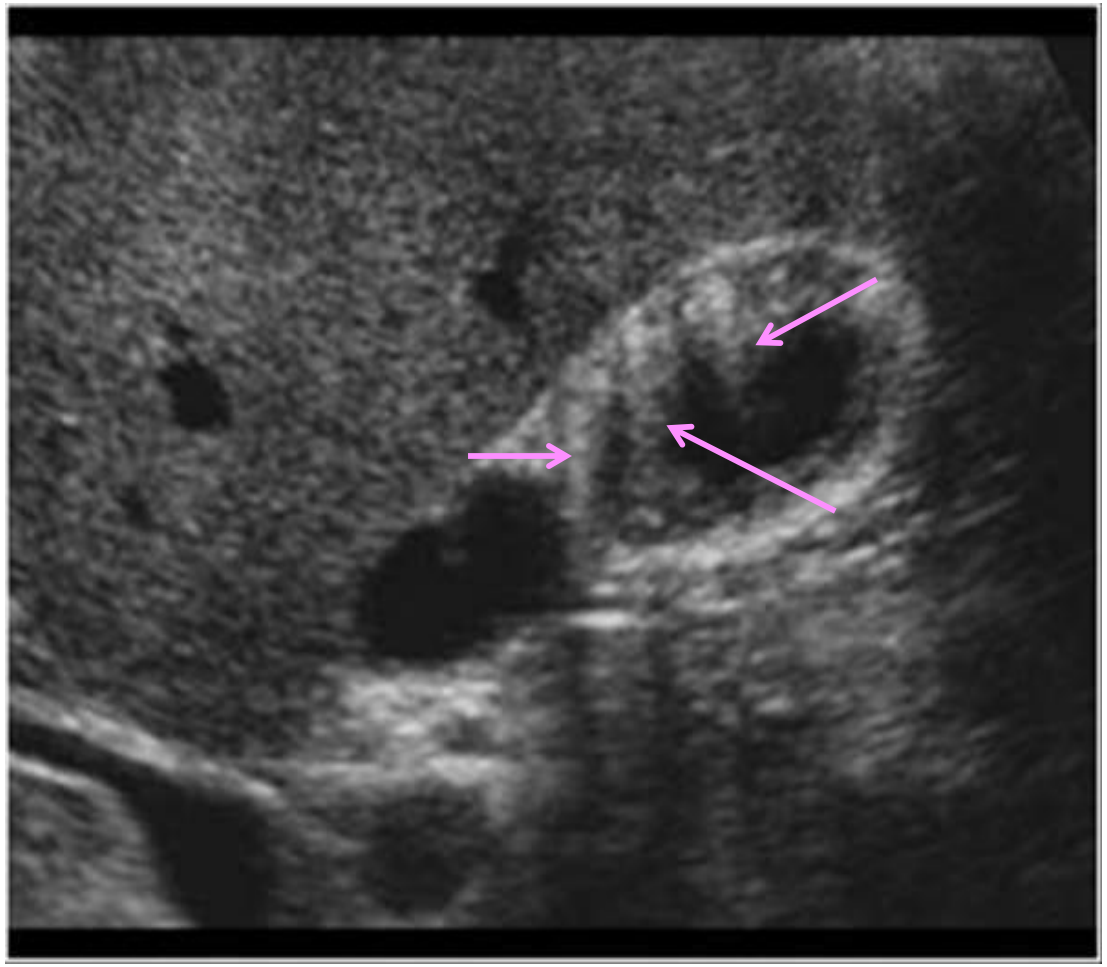
❑ **What is the important of this disease?**

Misdiagnose with stone, benign lesion and can convert to malignant lesions, F/U is needed.

posterior acoustic enhancement = fat "pink arrows"

Unlike stone

- This tumor consist of fat and muscle which will cause thickening of the wall of gall bladder.
- This tumor associated with formation of intramural diverticula or sinus tracts termed **Rokitansky-Aschoff sinuses.**



Case 9

❖ **Questions:**

- ❑ **What is the modality?**
- ❑ **What is the findings?**
- ❑ **What is the diagnosis?**

Case 9

❖ **Answers:**

❑ **What is the modality?**

Ultrasound

❑ **What is the findings?**

Shrink, nodular surface, hyperechoic texture, ascites.

❑ **What is the diagnosis?**

Liver cirrhosis

Case 10

❖ **Questions:**

- ❑ **What is the modality?**
- ❑ **What is the findings?**
- ❑ **What is the diagnosis?**
- ❑ **What is other imaging modality to confirm the diagnosis?**

Case 10

❖ **Answers:**

❑ **What is the modality?**

U/S

❑ **What is the findings?**

Hyper-echoic focal hepatic nodule

❑ **What is the diagnosis?**

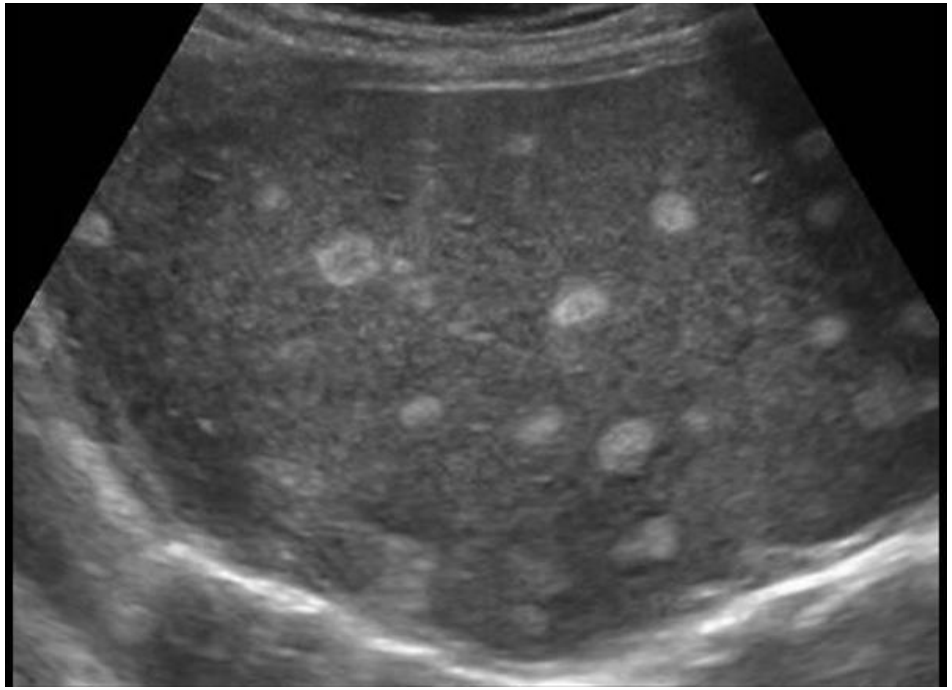
Hemangioma

❑ **What is other imaging modality to confirm the diagnosis?**

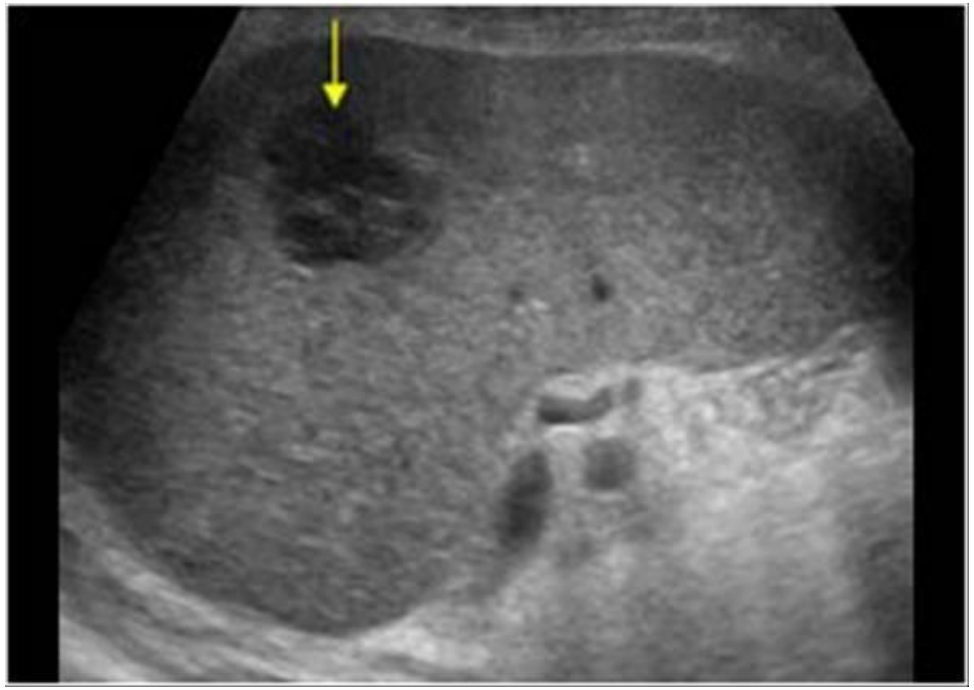
- Triphasic liver CT scan
- MRI

The white long line don’t worry about it is reflection by the diaphragm ^^

Case 10



Hyper echoic lesions multiple > metastatic



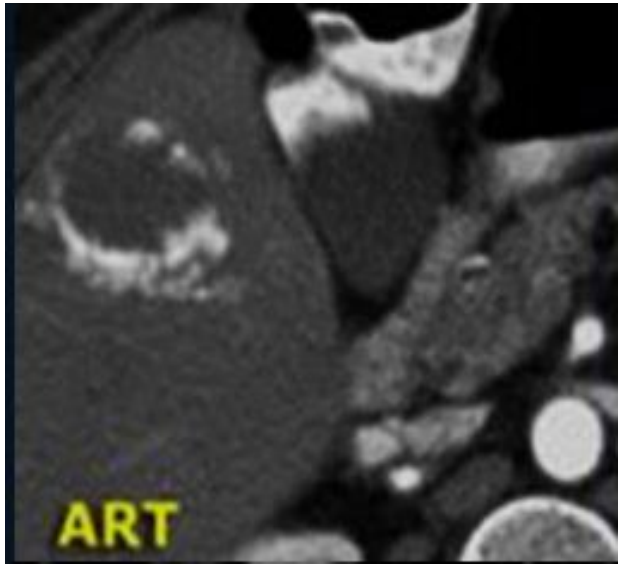
Hypo echoic lesions > malignant

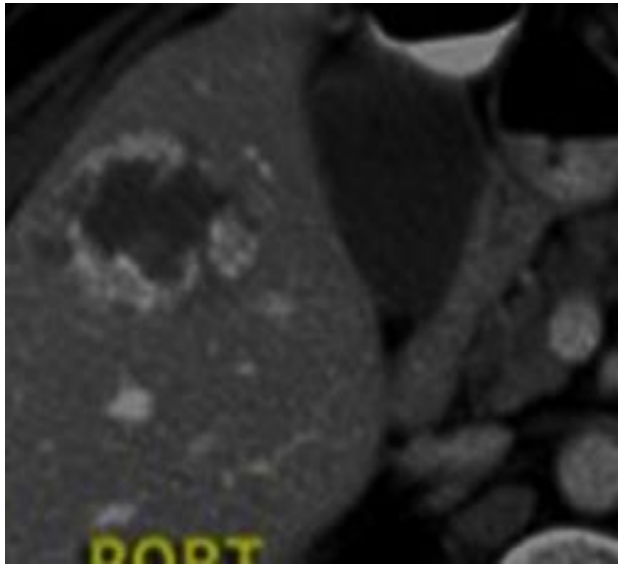
Notes:

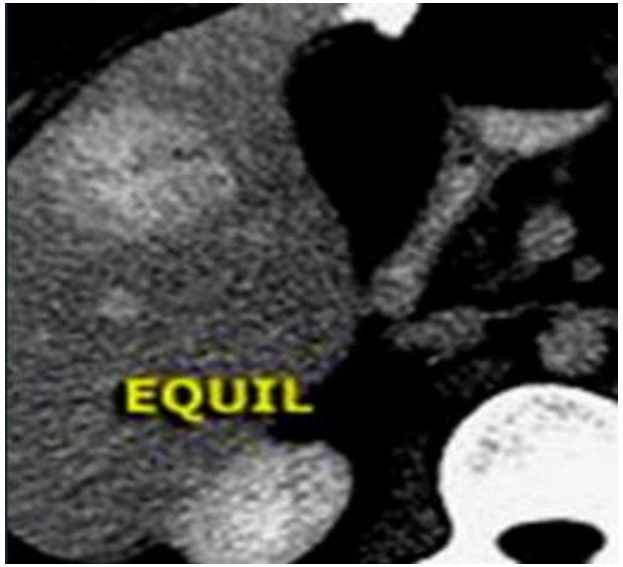
- Scanning during the arterial phase, about 30 seconds after the injection of contrast, will show lesions such as **Haemangiomas.**
- Haemangiomas are typically well-defined, peripheral, echogenic masses at ultrasound. “Incidental”

Case 10

Triphasic liver CT scan of the same patient







Peripheral nodular enhancement

Homogenous enhancement

- In arterial phase there is **peripheral nodular enhancement** there will be wash in the venous phase.
- finally there will be **homogenous enhancement** in delayed phase this represent **“Typical Hemangioma”.**

Case 11

❖ **Questions:**

- ❑ **What is the modality?**
- ❑ **What are the findings?**
- ❑ **What is the diagnosis?**

Case 11

❖ **Answers:**

❑ **What is the modality?**

Triphasic liver CT scan

❑ **What are the findings?**

Focal hepatic lesion with fill-in enhancement

❑ **What is the diagnosis?**

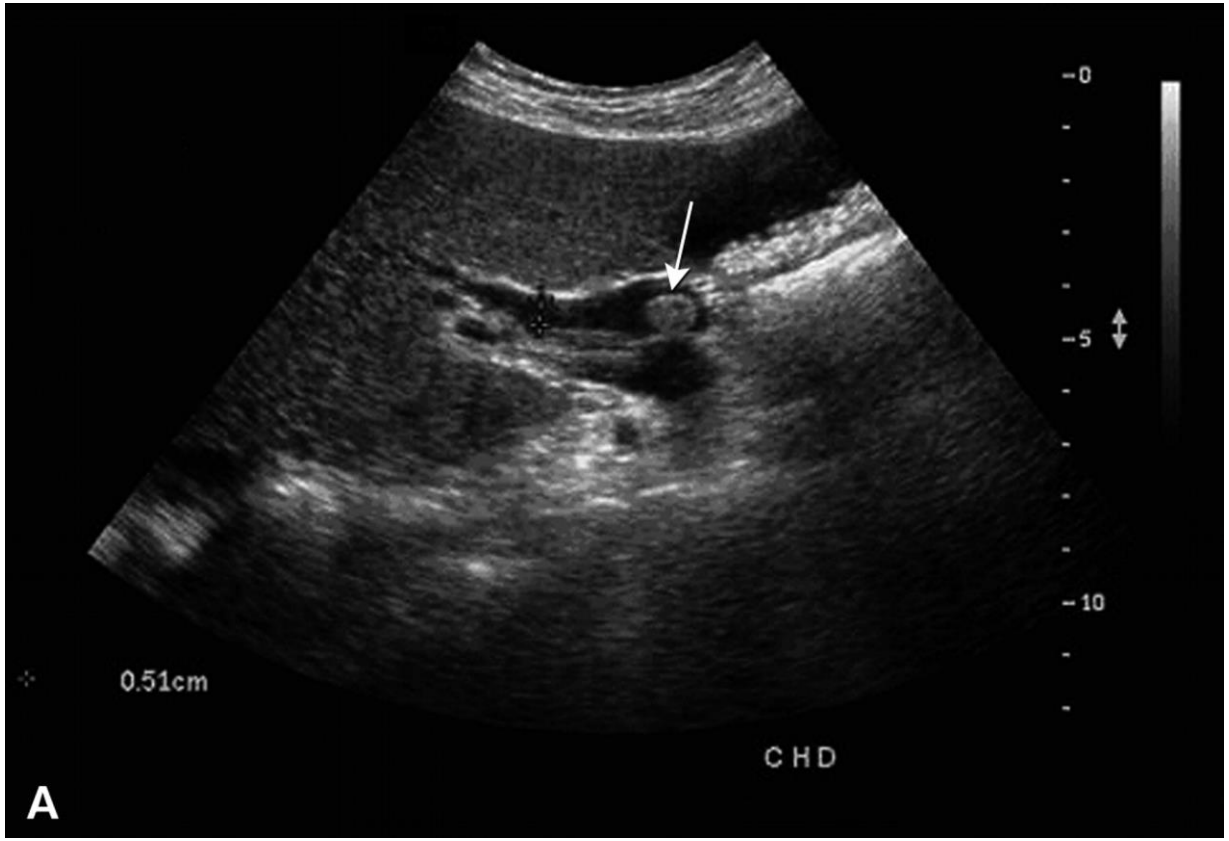
HCC or metastatic

- In the **arterial phase** there is early enhancement hen there will be iso-enhancement in the **venous phase (same as the surrounding tissue(.**
- And the **late phase** it will be washout of the contrast and this represent **hepatocellular carcinoma or metastasis.**

Case 12

❖ **Questions:**

- ❑ **What is the modality?**
- ❑ **What is the findings?**
- ❑ **What is the diagnosis?**
- ❑ **What is the expected symptoms and signs the patient has?**



Case 12

❖ **Answers:**

❑ **What is the modality?**

U/S

❑ **What is the findings?**

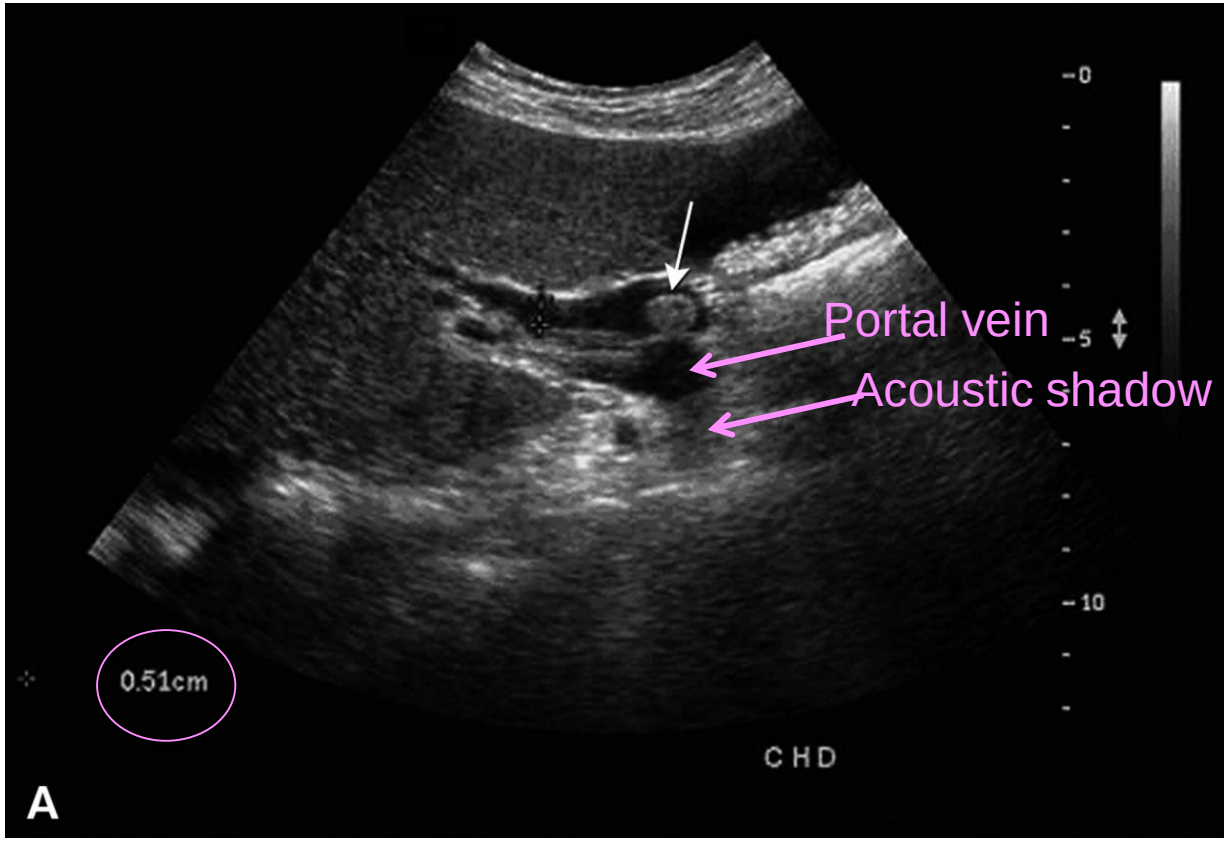
Hyperechoic lesion in CBD

❑ **What is the diagnosis?**

CBD stone (white arrow)

❑ **What is the expected symptoms and signs the patient has?**

Yellow discoloration. RUQ pain. Hyper-bilirubinemia and dark urine.



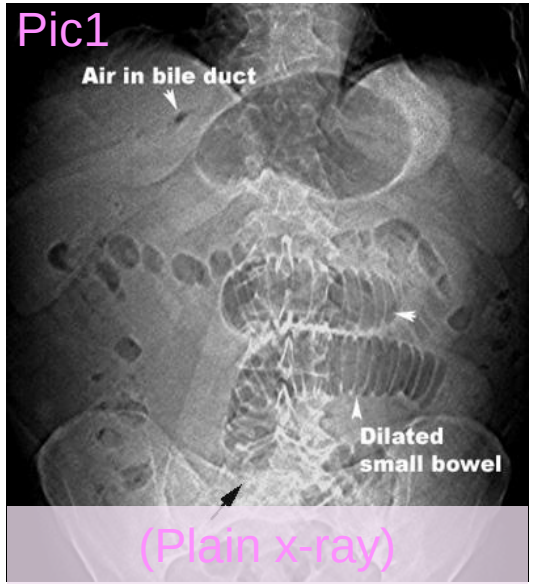
Normal diameter of CBD is 4mm but in the pic 0.51cm
So, CBD dilated

Case 12

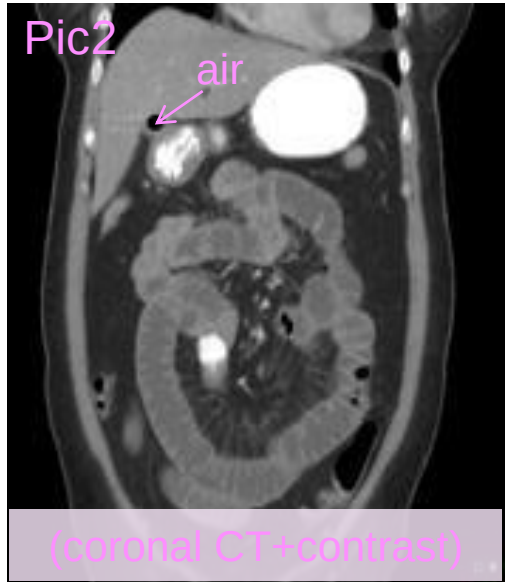
Pic1 **Tried:**

1. Air in the bile ducts, Pneumobilia.
2. Dilatation of the small bowel.
3. Calcified stone in the distal bowel.

Pic2
- **Triad of?** Gallstone Ileus.
- **Diagnosis by** Radiology**.**
- **Treatment by** Surgery**.**

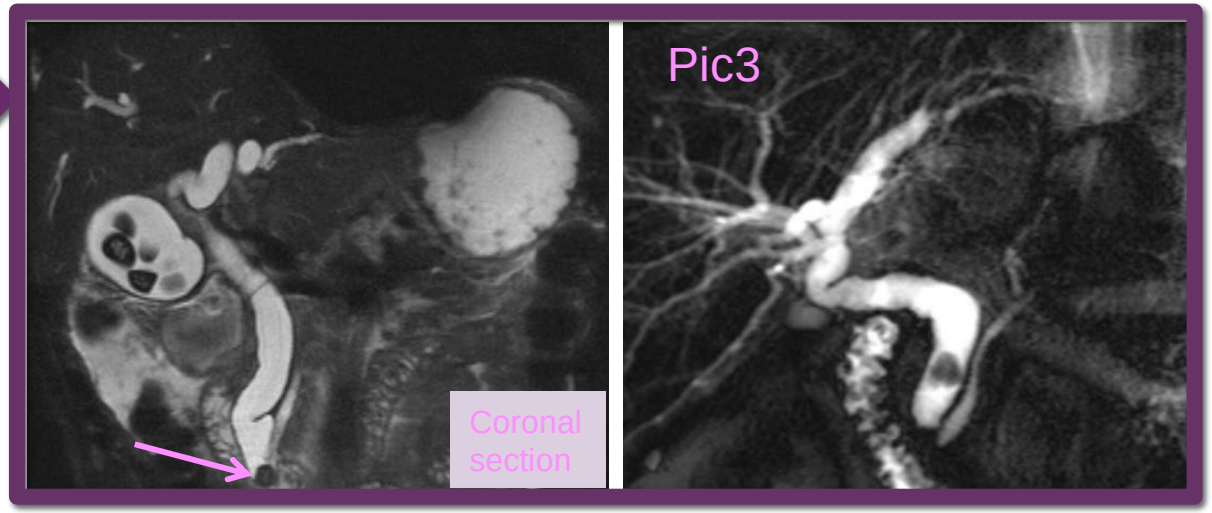


(Plain x-ray)



(coronal CT+contrast)

- ❑ MRCP = MRI Cholangio-Pancreatico-graphy.
- ❑ The dark signals in the gallbladder is stone (multiple stones) impacted in distal CBD and dilatation of the bile ducts.

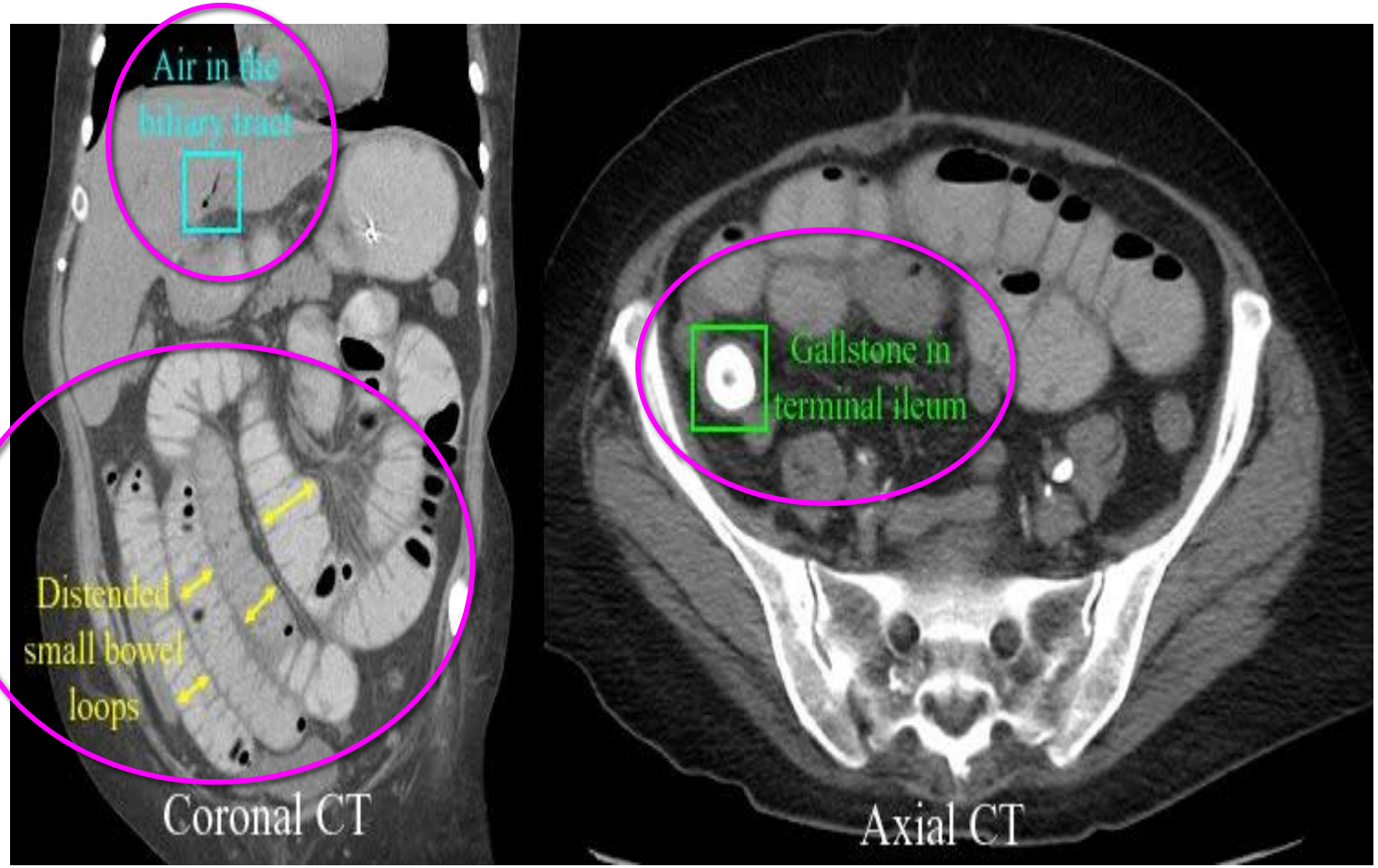


Stone in …
1) "Proximal CBD" > **PTC** (diagnostic & therapeutic) to drain bile to prevent infection due to stagnation
2) "Distal CBD" > obstruction of ampulla of veter > **ERCP** and do myomectomy (Pink arrow) & pic3 is extra

PTC = Percutaneous transhepatic cholangiography,

Case 12

Terminal ilium stone > surgery



Extra

Extra:

- This is **ERCP** shows large filling defect of gall bladder which is large gall stone and we can see the contrast around the stone (white arrows) the gall bladder causes compression and dilatation of the common hepatic or common bile ducts by **indirect obstruction** (from outside) it is called **“Mirizzi's syndrome”**

DONE !