

# Radiology of hepatobiliary diseases

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Cases.....

# Case 1

45 year-old female with RUQ pain radiating to right shoulder and aggravated by fatty meals associated with vomiting.

- What is most likely diagnosis?
- What is the best radiology modality to start with?

**What is  
abnormal?**





**Normal**



**Abnormal**



**Normal**



**Acute calculous cholecystitis**

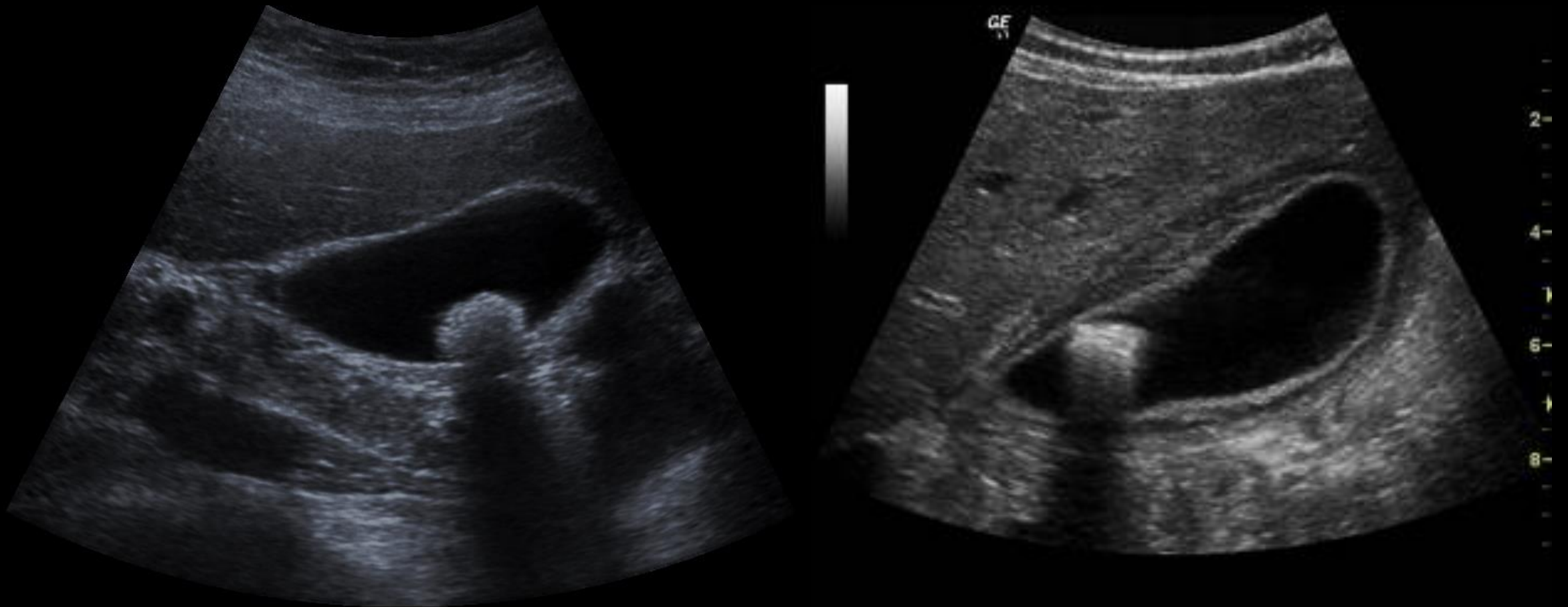
# Acute cholecystitis:

- Gallbladder wall **thickening** (more than 3mm)
- Gallbladder **distension**
- Surrounding **fluid**
- With Gallstone (**calculous** cholecystitis) without stone (**Acalculous** cholecystitis)





What is the difference between the two images?



What is the difference between the two images?

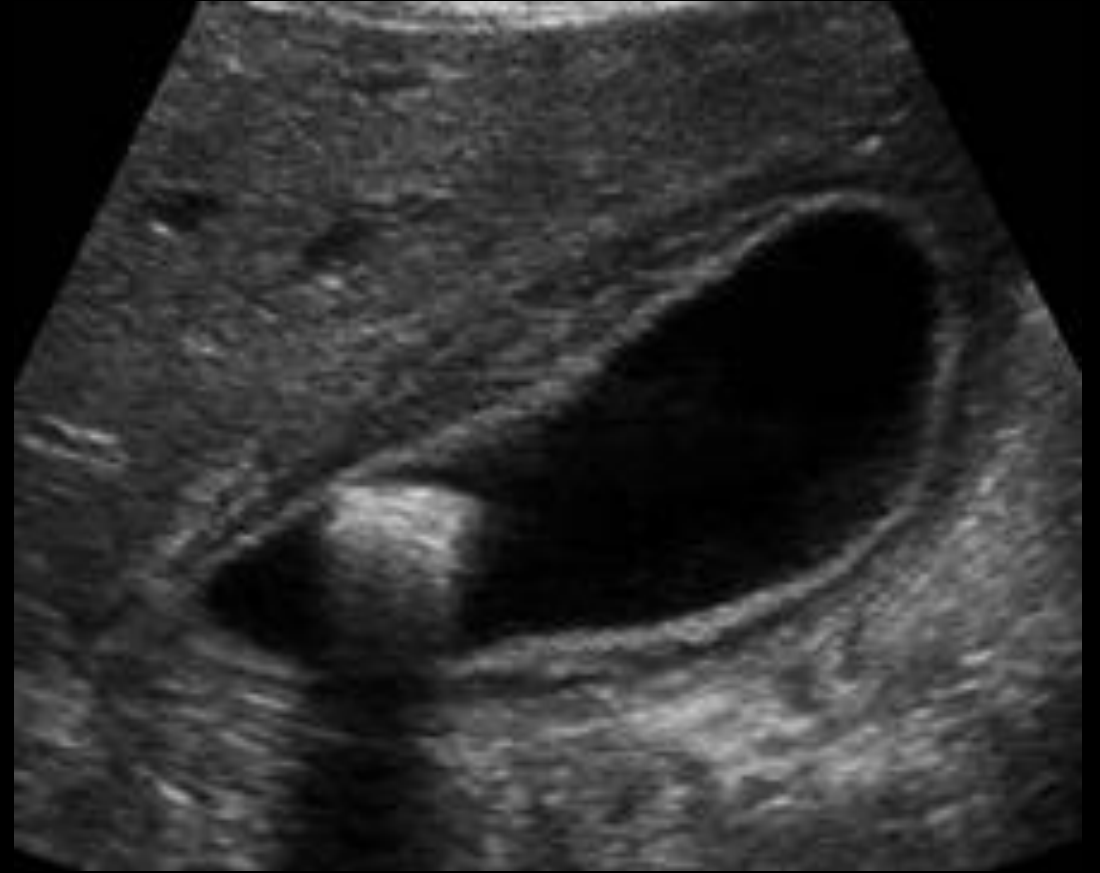
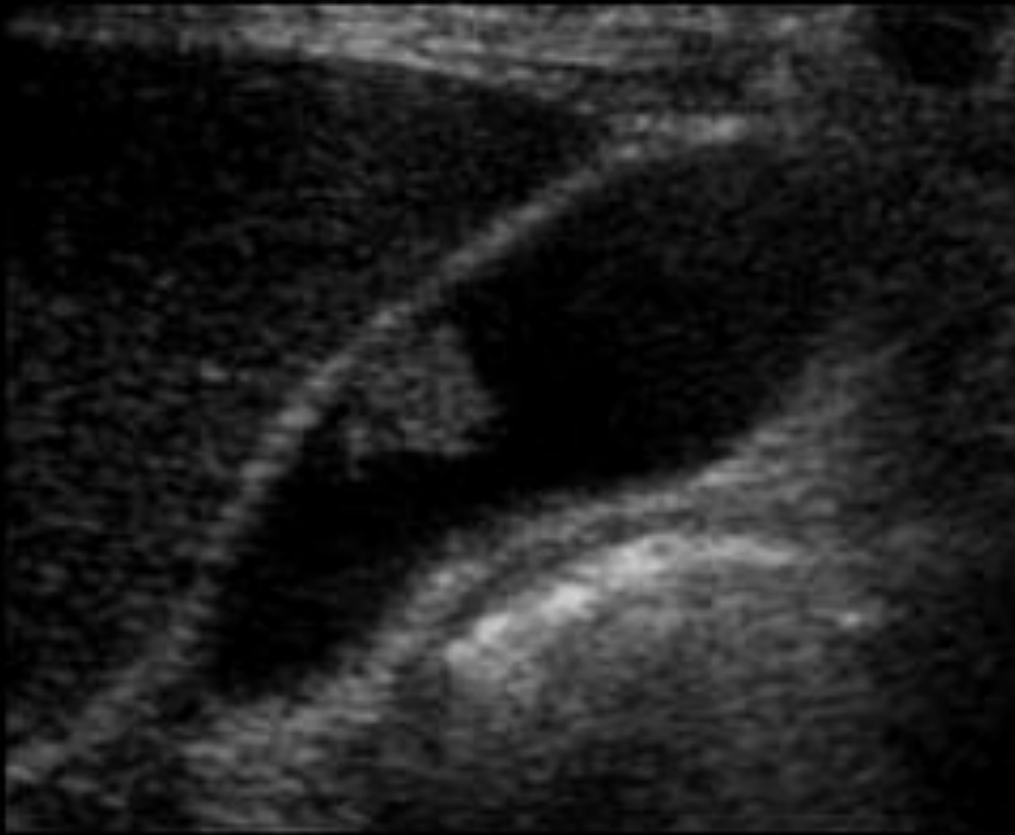


Stone **WITHOUT** inflammation

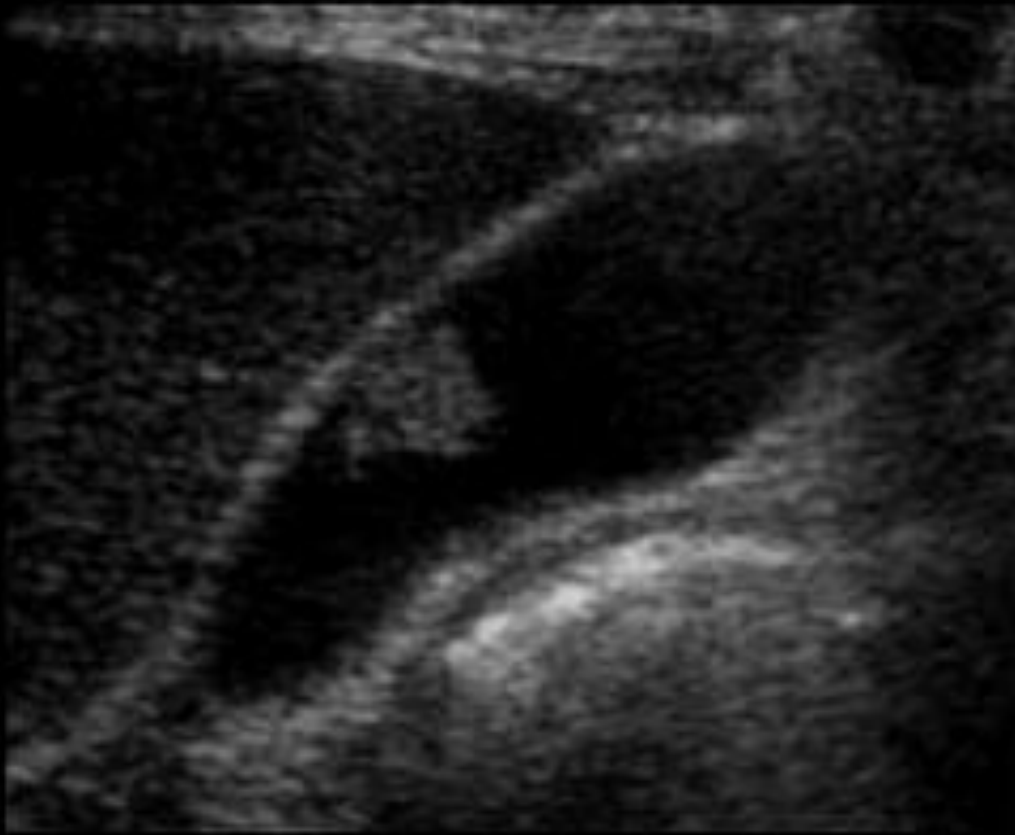


Stone **WITH** inflammation

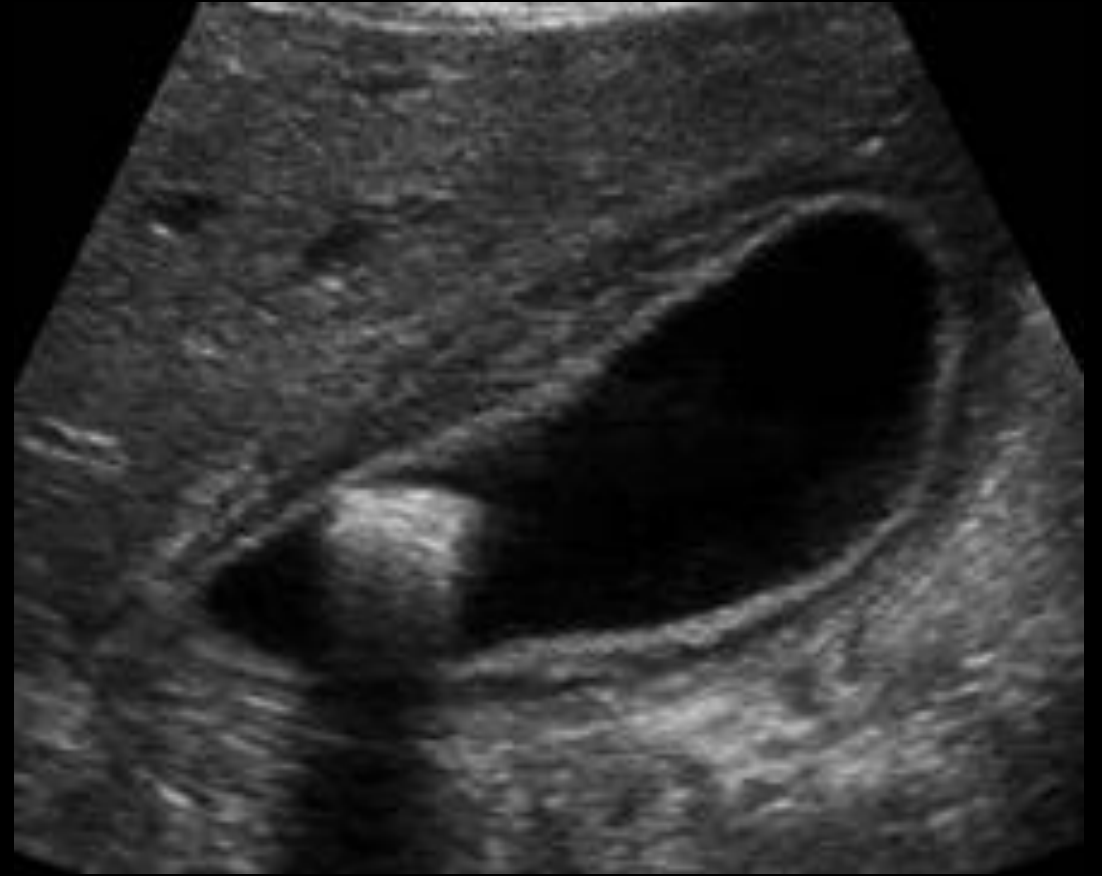
What is the difference between the two images?



What is the difference between the two images?

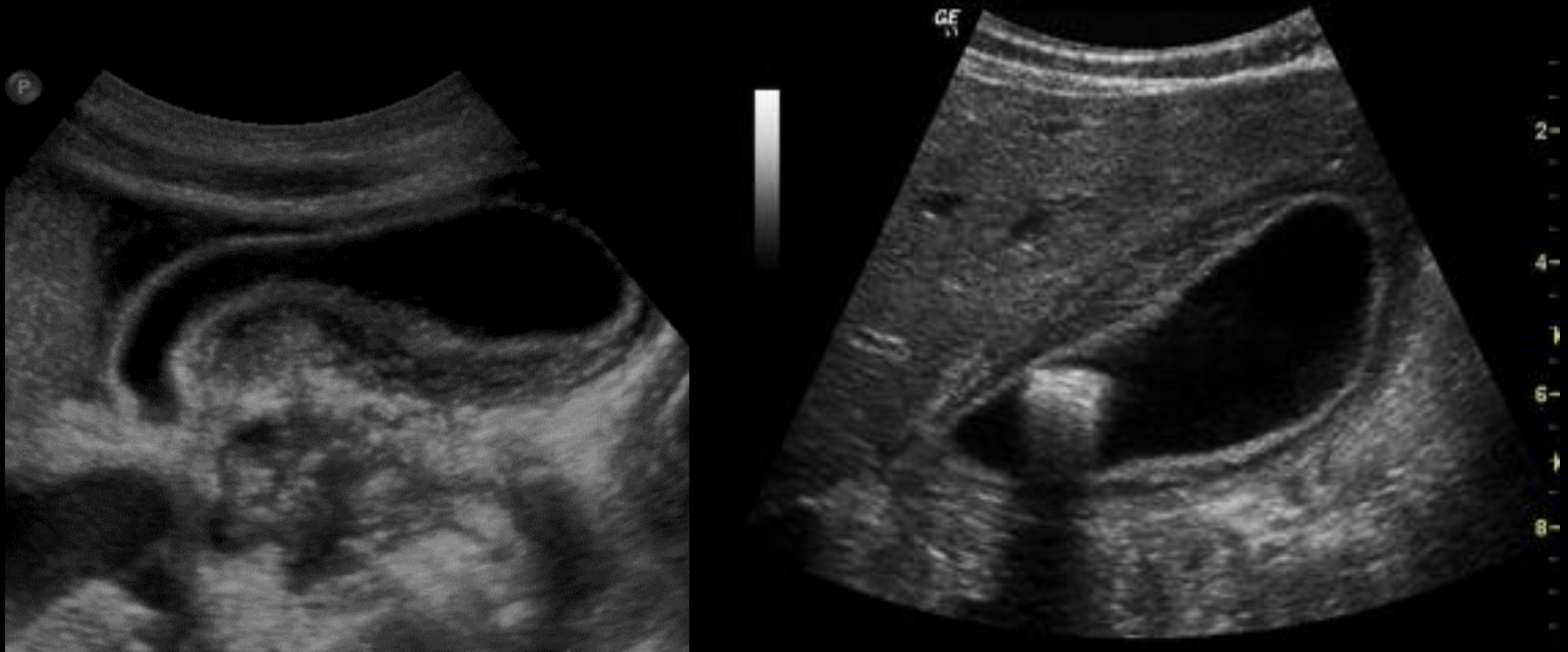


**WITHOUT** acoustic shadow (GB **polyp**)



**WITH** acoustic shadow (GB **stone**)

What is the difference between the two images?



What is the difference between the two images?

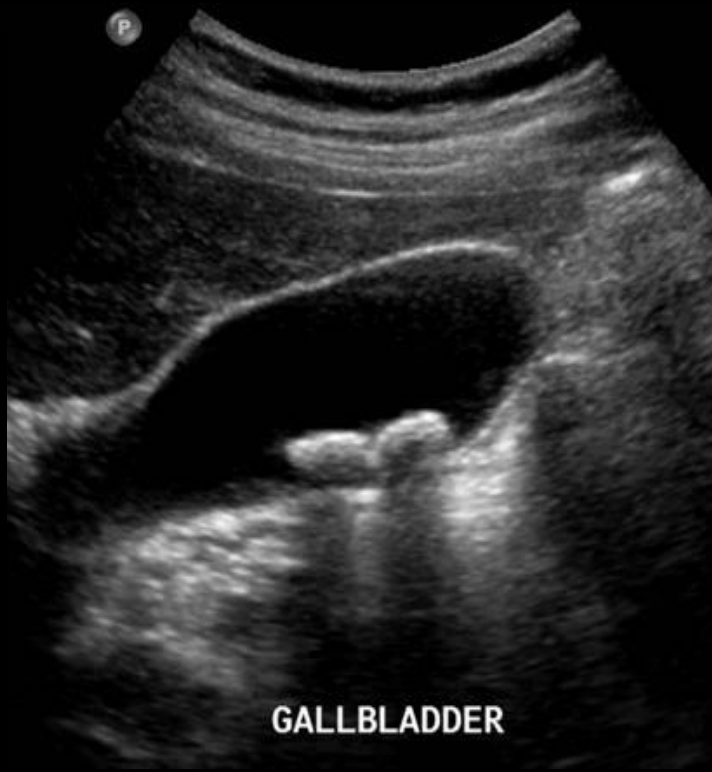


**Acalculous** cholecystitis

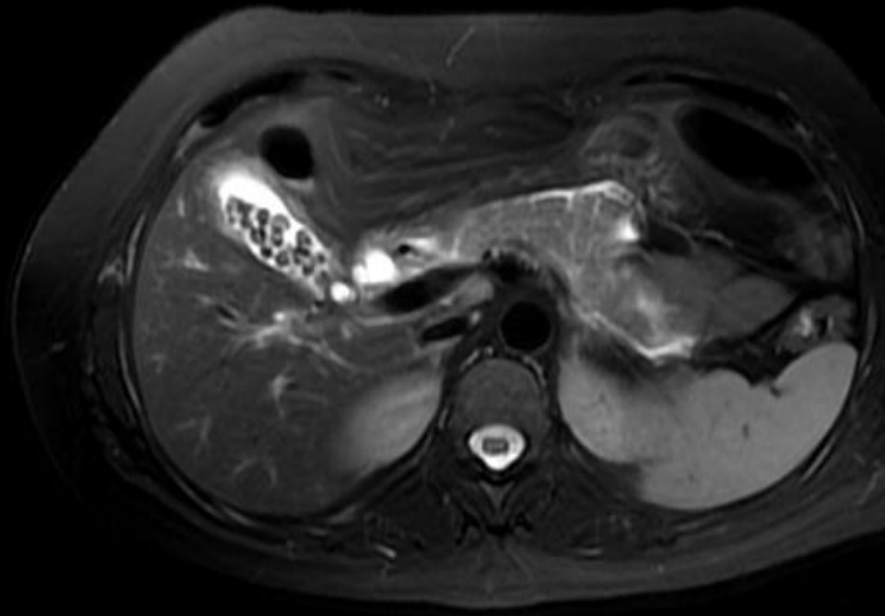
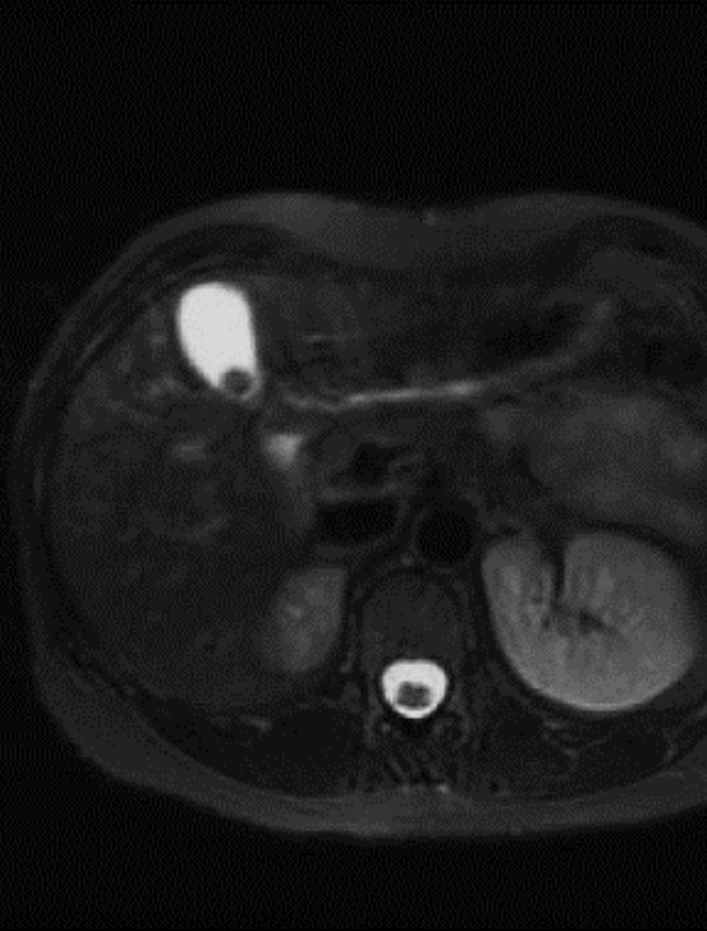


**calculous** cholecystitis

# Different gallstones .....



# Gallstones on MRI





# Case 2

60 year-old male with chronic alcohol consumption and complaining of fatigue, disorientation and abdomen distension.

- What do you think this patient has?
- What radiology modality you will start with ?

What is  
abnormal?





**Normal**



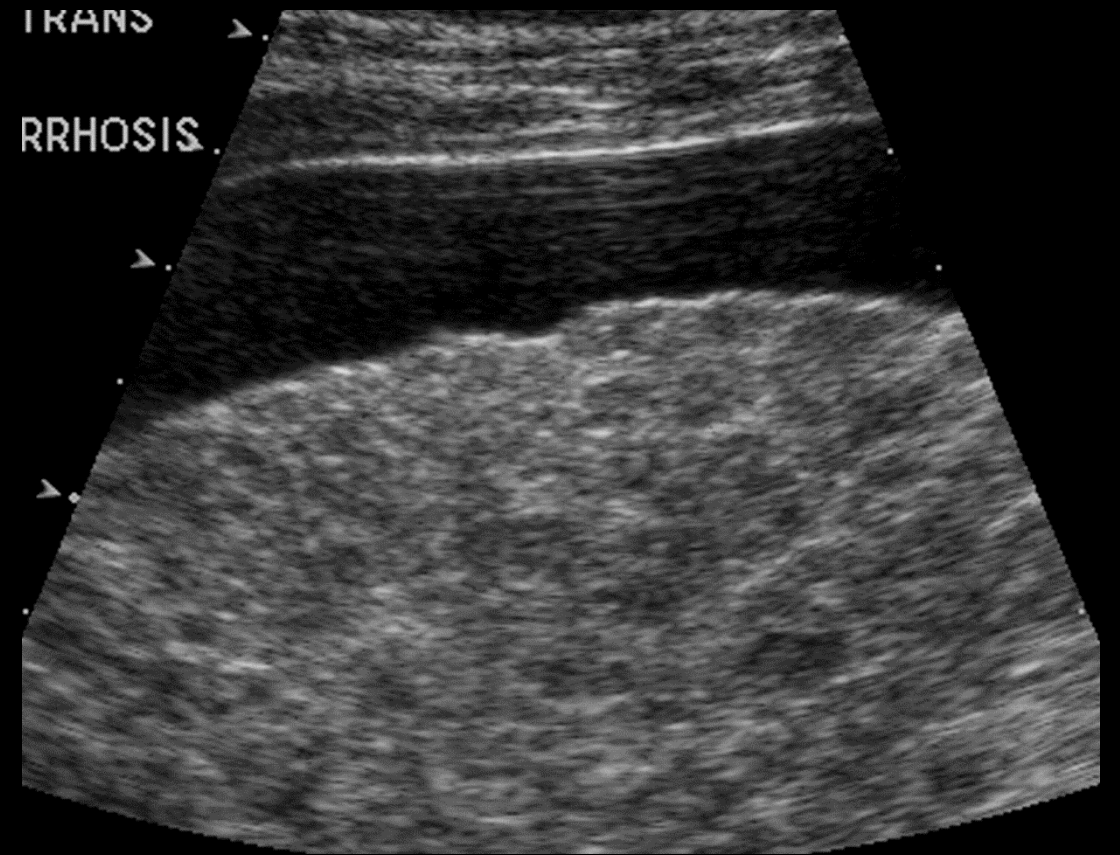
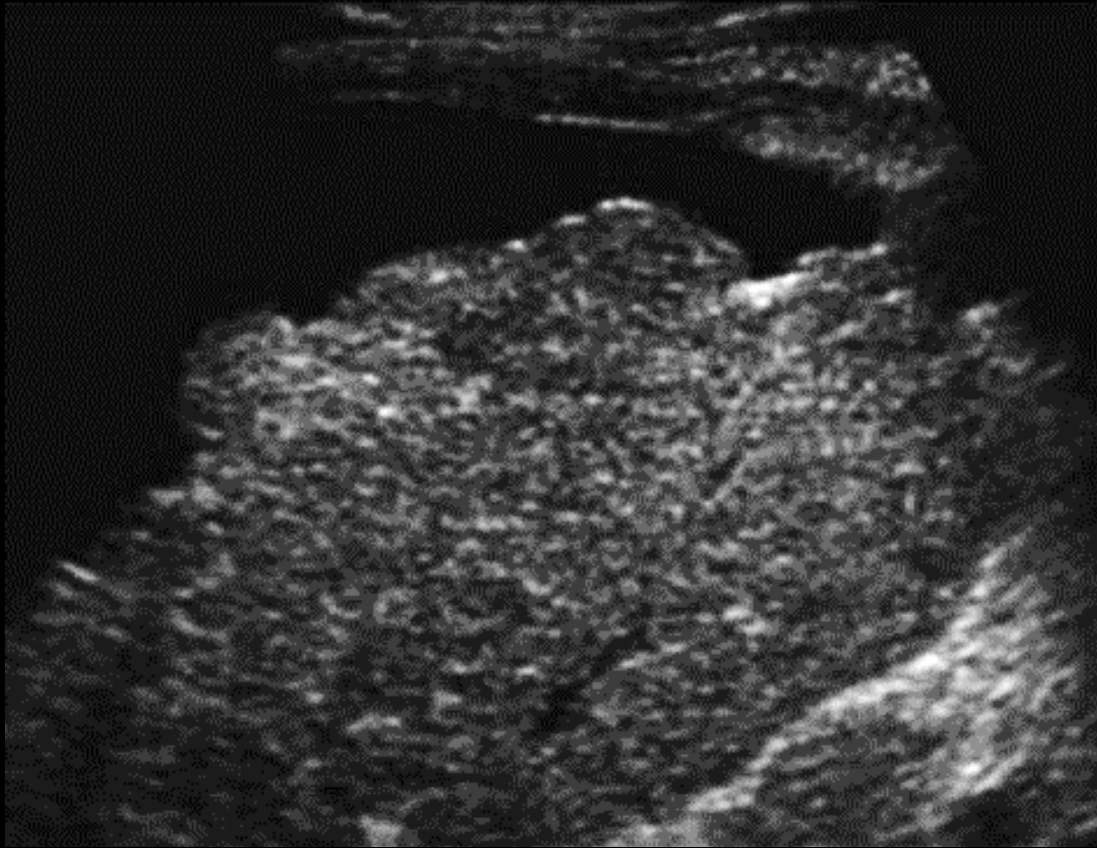
**Abnormal**

# Liver cirrhosis:

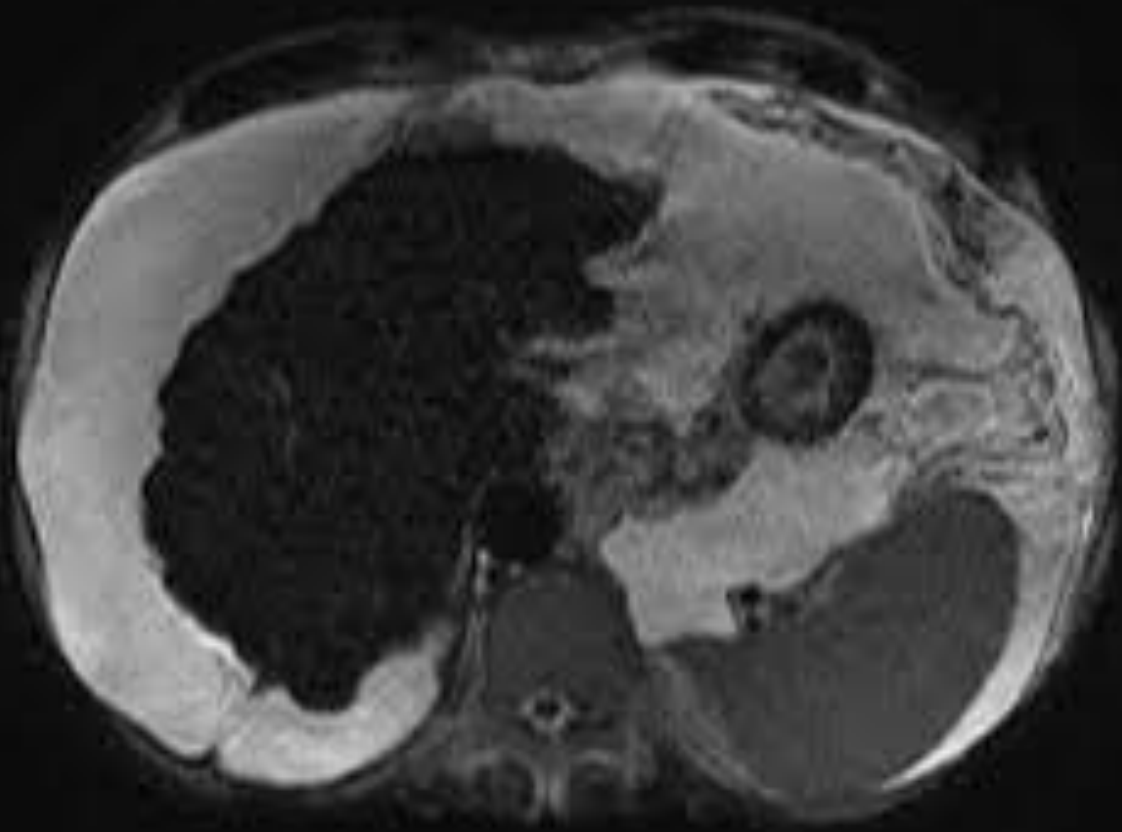
- Nodular surface
- Shrunken (small) size
- Hyper echoic parenchyma (fibrosis)
- -/+ Ascites



# Other examples of cirrhosis



# Cirrhosis on CT scan and MRI:



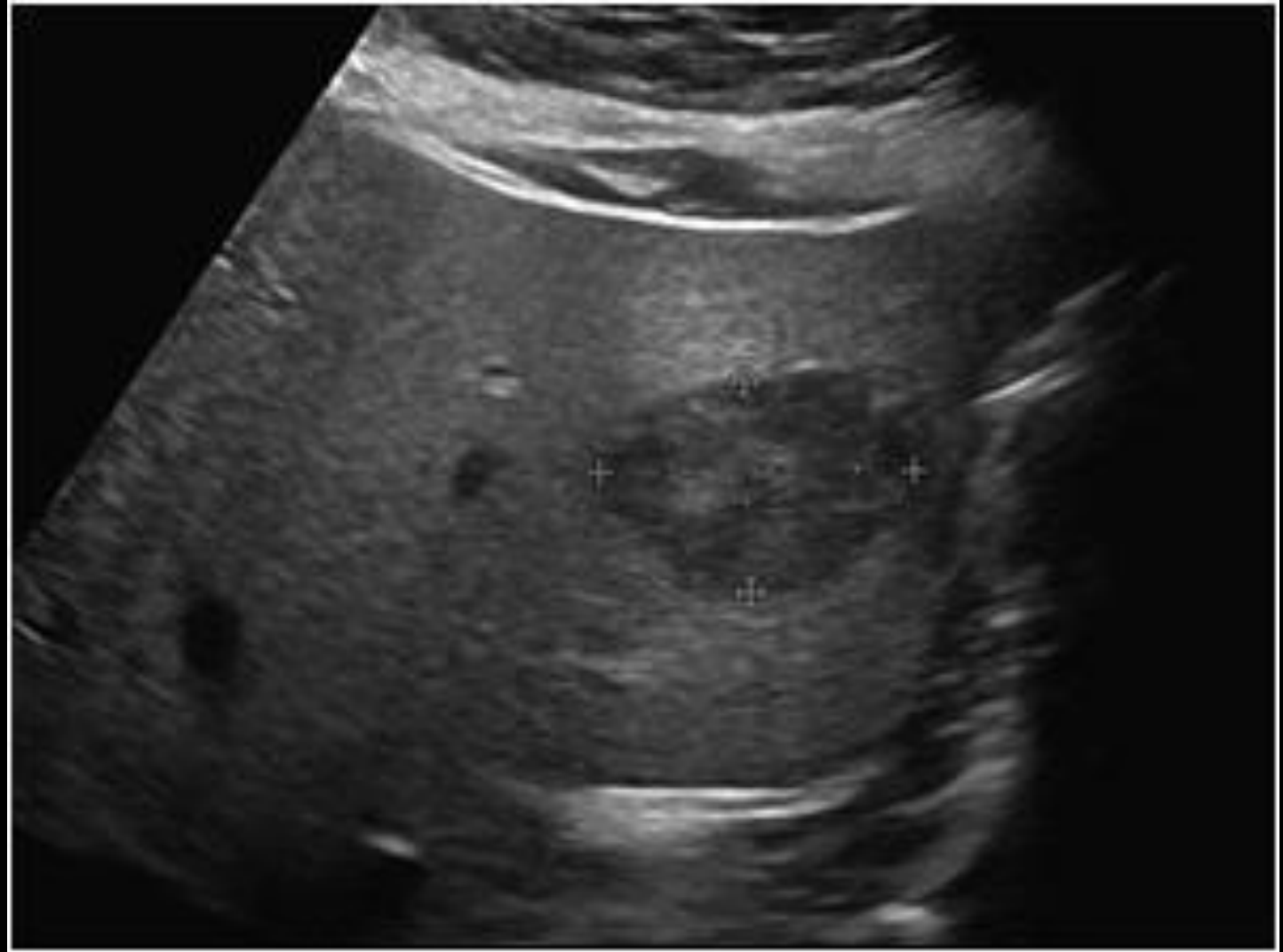
# Case 3



US for a patient with  
chronic hepatitis B virus.  
What is your diagnosis?

What is DDx?

Next step?



# DDx:

## Benign:

Hemangioma

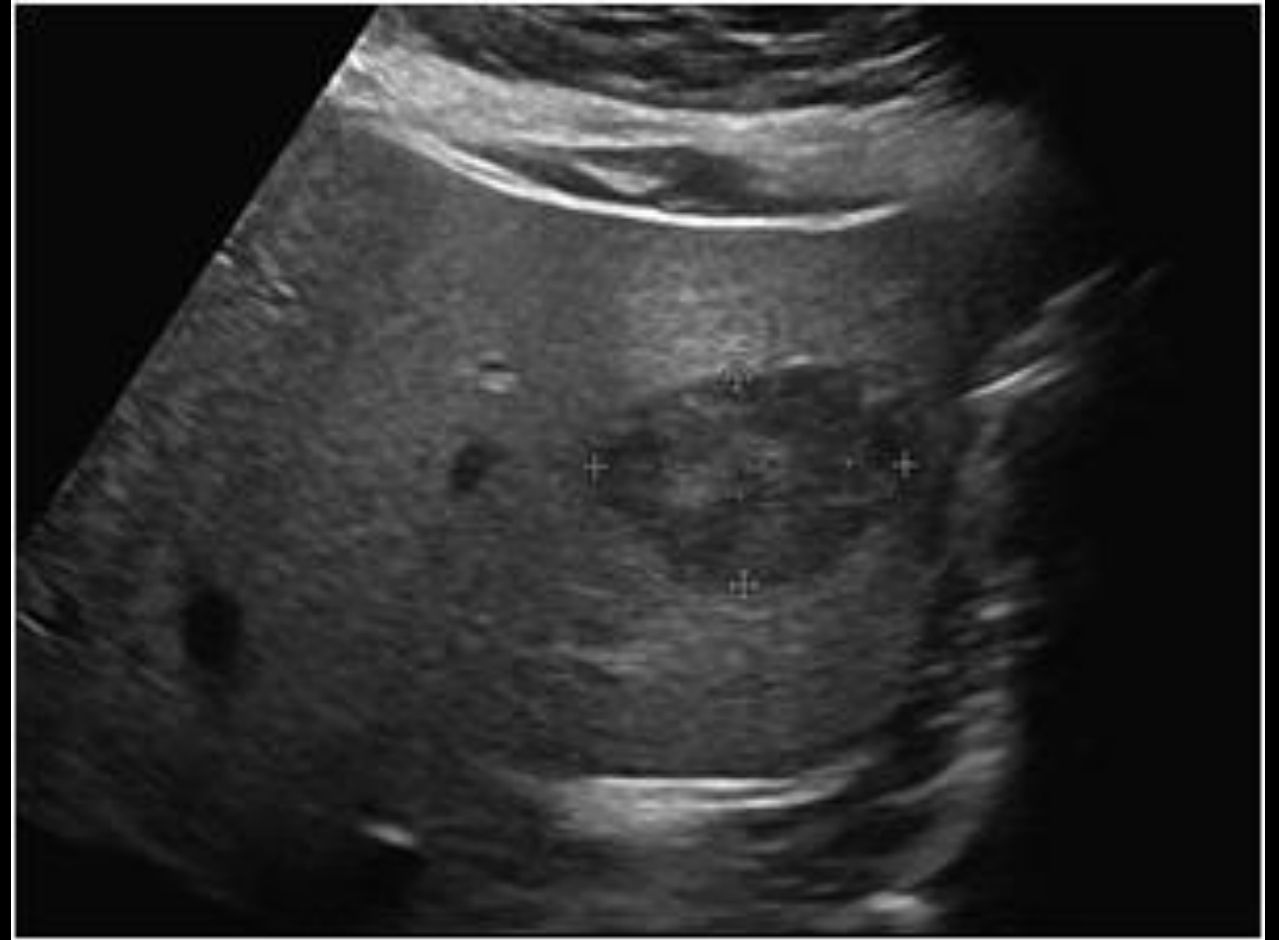
Adenoma

Focal nodular hyperplasia

## Malignant:

Hepatocellular carcinoma

Metastasis



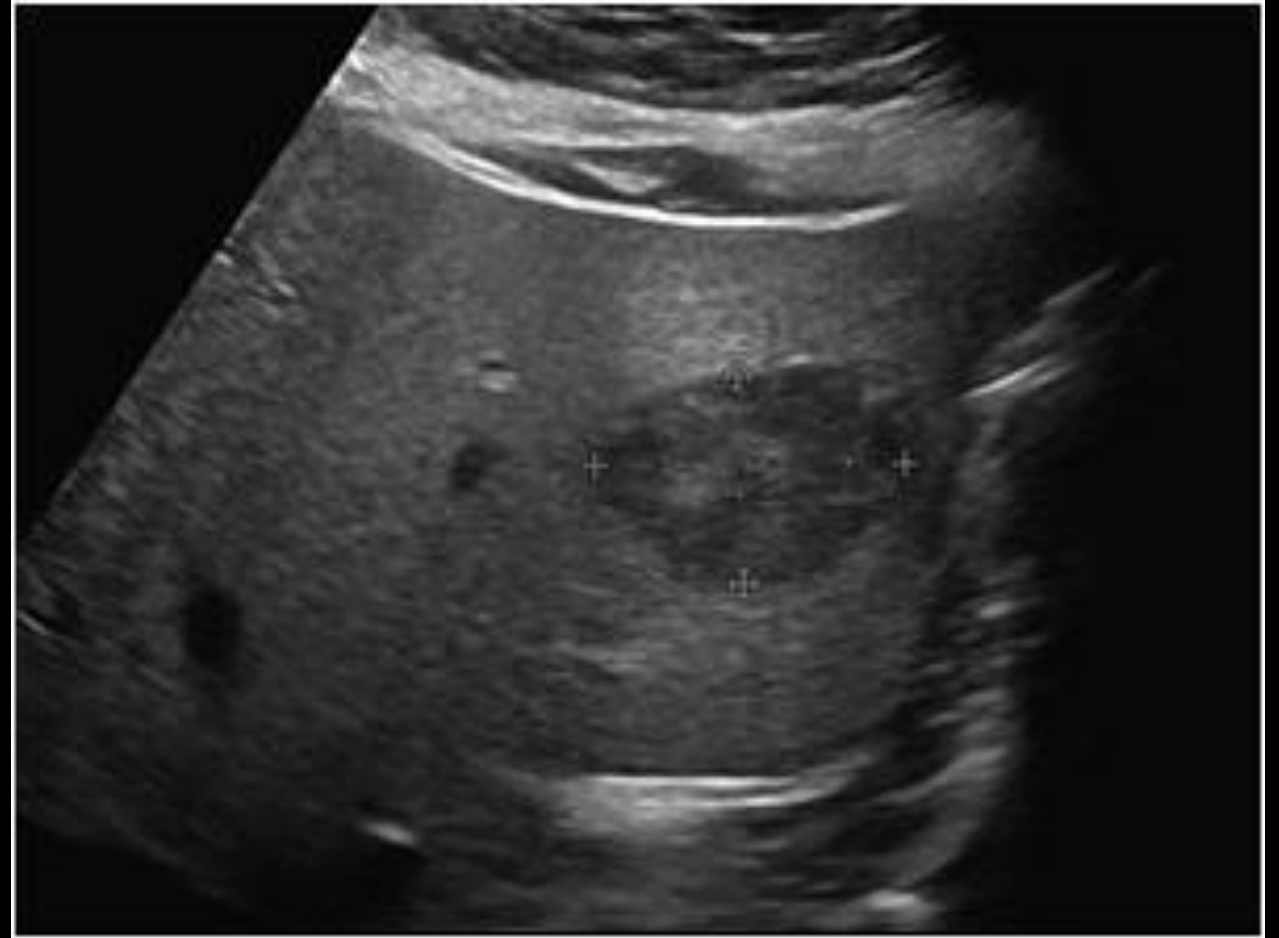
## DDx:

### Benign:

- Hemangioma
- Adenoma
- Focal nodular hyperplasia

### Malignant:

- Hepatocellular carcinoma
- Metastasis



**How to tell if its benign or malignant ????**

## DDx:

### Benign:

Hemangioma

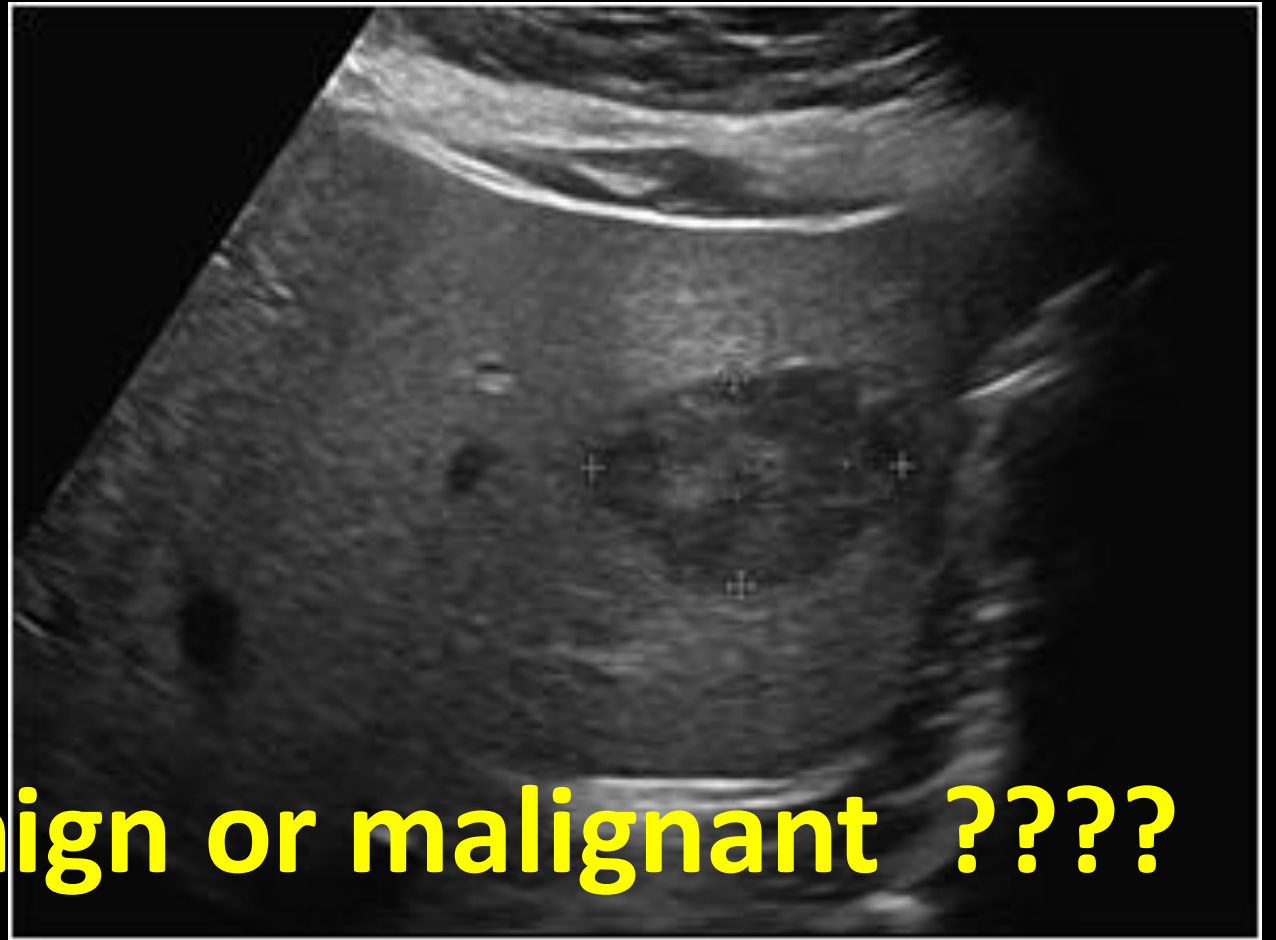
Adenoma

Focal nodular hyperplasia

### Malignant:

Hepatocellular carcinoma

Metastasis



**How to tell if its benign or malignant ????**

**DO CT scan or MRI with  
intravenous contrast**

# CT scan with IV contrast (triphasic scan)



# CT scan with IV contrast (triphasic scan)

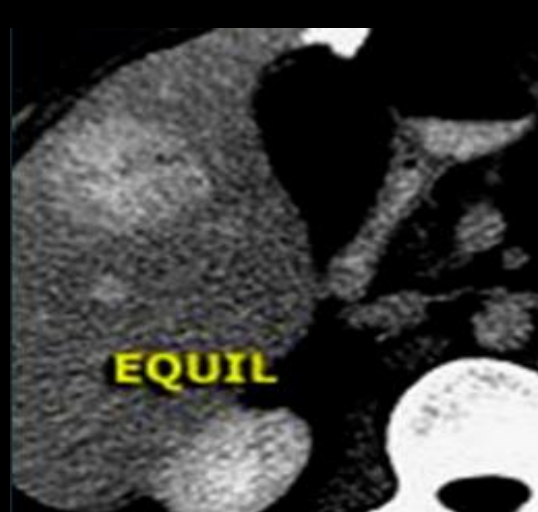
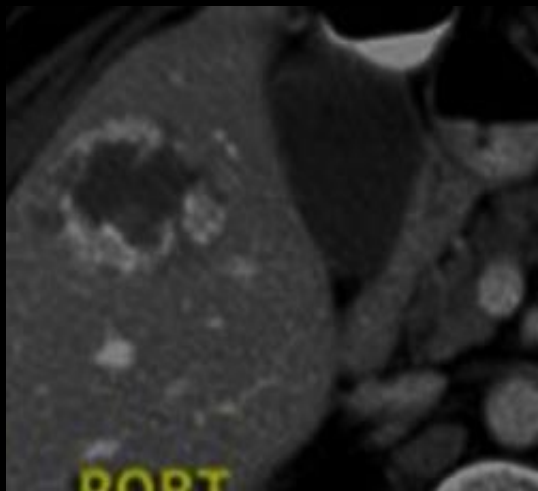
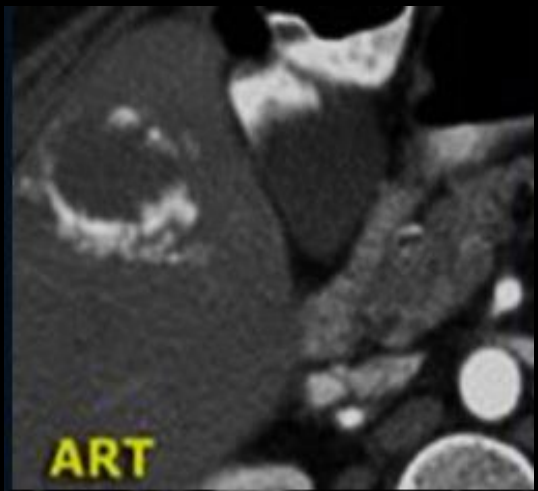
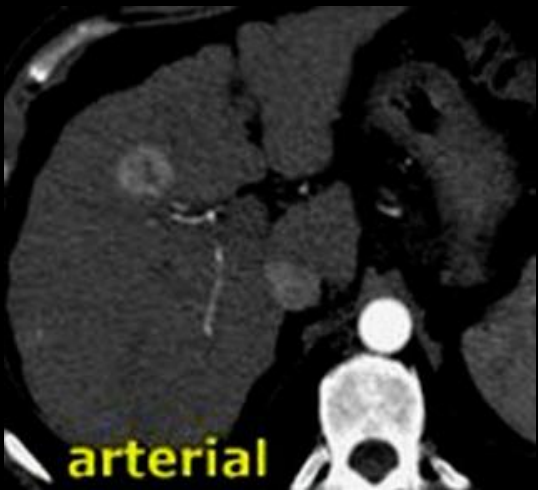


**Hepatocellular carcinoma**

# Triphasic liver CT scan

- Scanning liver with **intravenous** (IV) contrast in **three** different phases:
  - **Phase 1 (arterial)**: when IV contrast in arteries/ 30 to 40 seconds after IV contrast injection.
  - **Phase 2 (portal-venous)**: when IV contrast in veins/ 60 to 70 seconds after IV contrast injection.
  - **Phase 3 (delayed or equilibrium)**: after 3 to 5 minutes after IV contrast injection.
- Triphasic scan helps in differentiating benign from malignant masses:
  - **Benign** = BLACK (no enhancement) in **phase 1** / WHITE (enhancement) in **phase 3 (e.g. hemangioma)**
  - **Malignant** = WHITE (enhancement) in **phase 1** / BLACK (no enhancement) in **phase 3 (e.g. HCC)**

What is the difference between both cases?



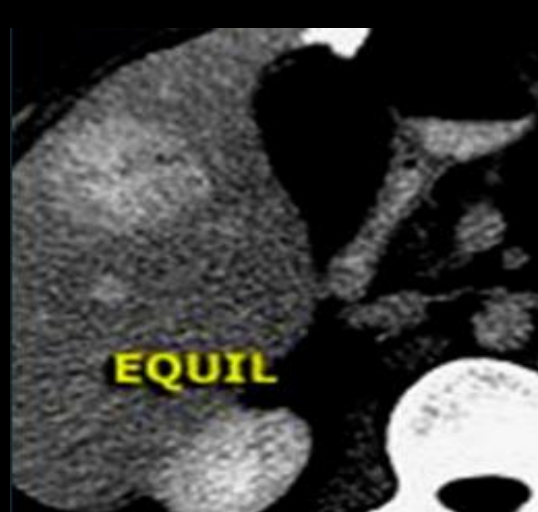
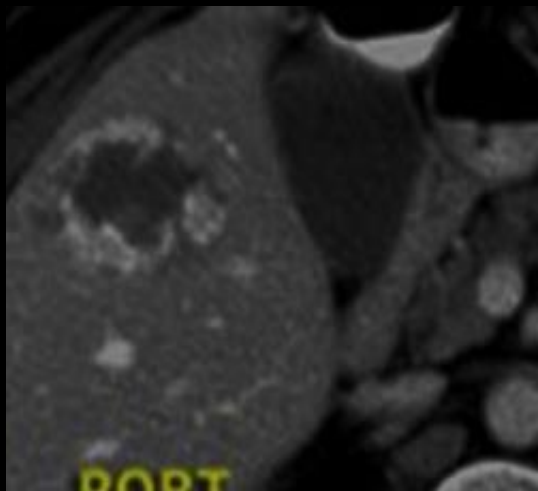
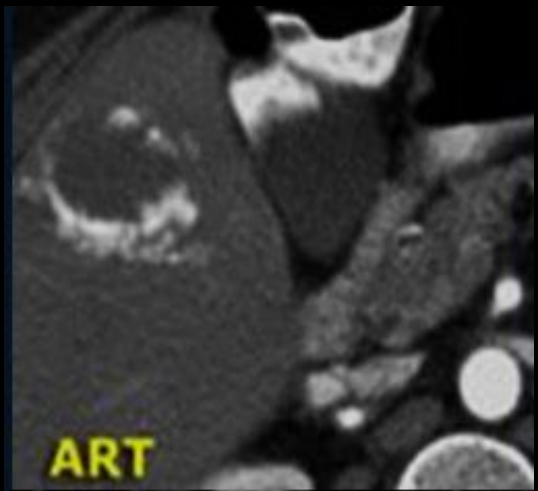


# What is the difference between both cases?

**Hepatocellular carcinoma**

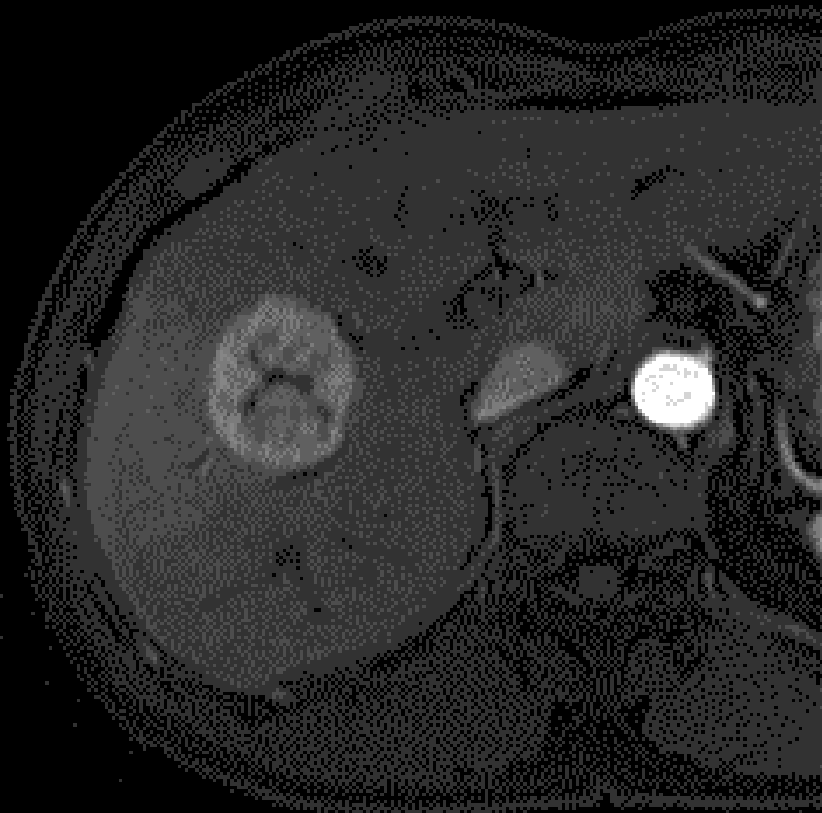


**Hemangioma**

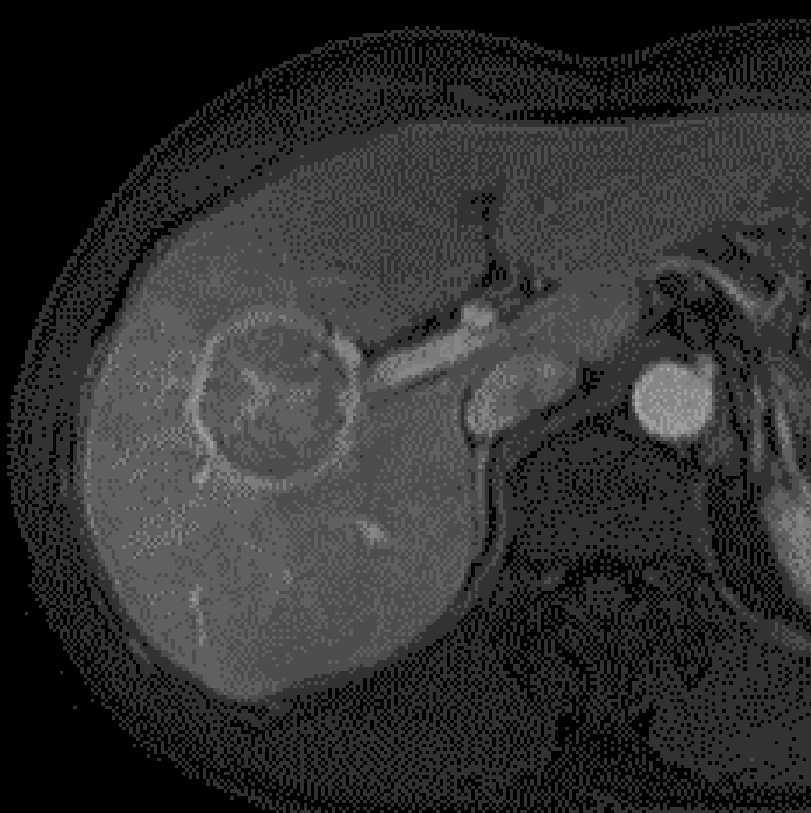


Benign or malignant ????

A



B

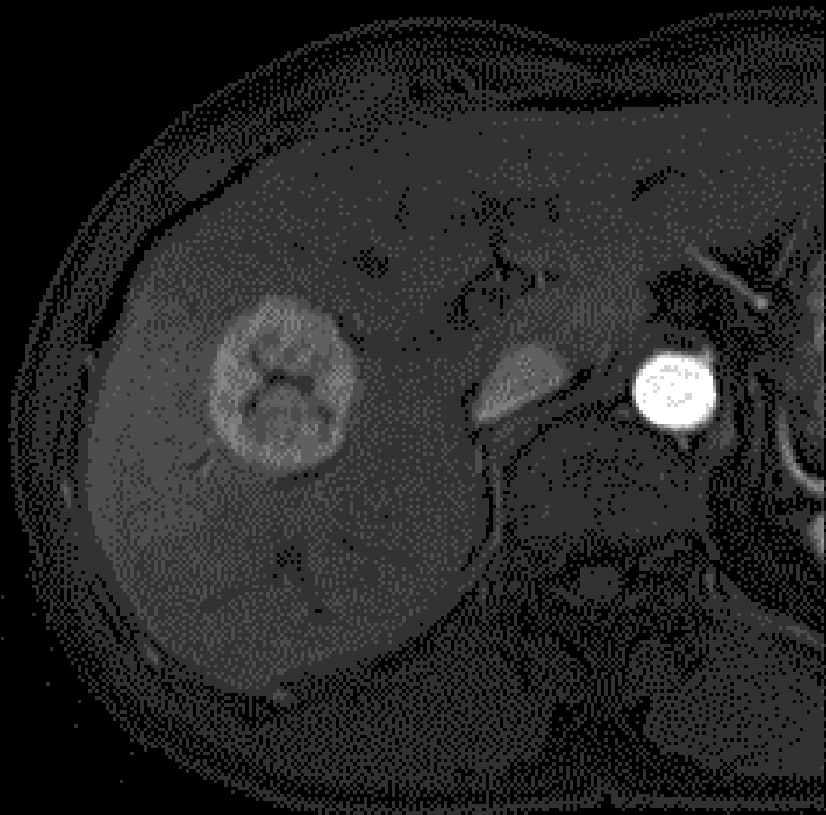


C

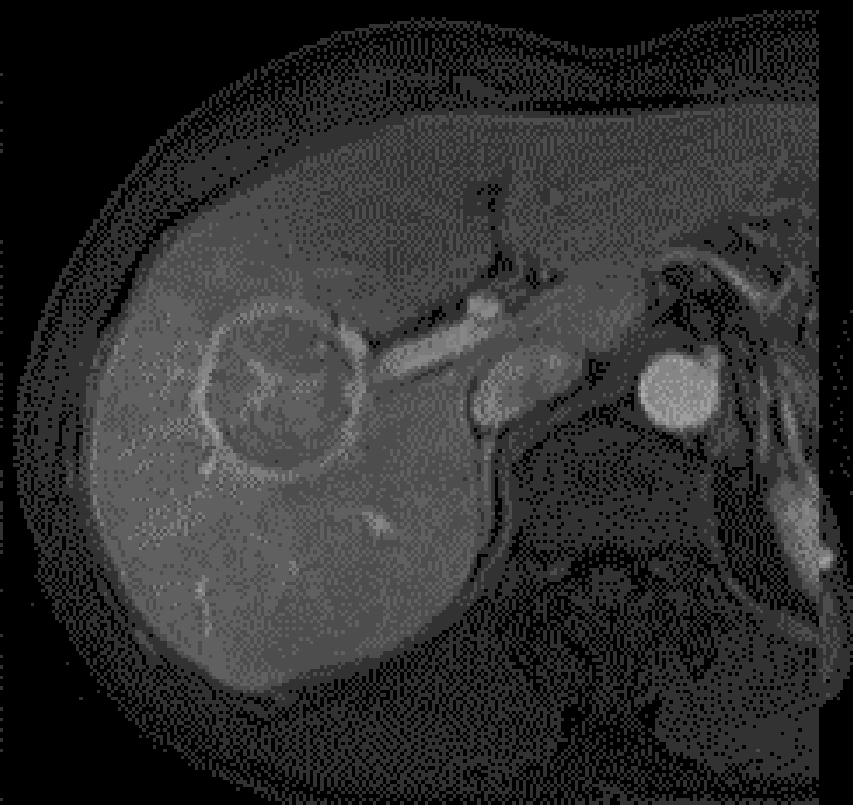


# Benign or Malignant ????

A



B



C



**Malignant (HCC)**

# Case 4

# Male patient with chorionic abdomen pain.

- What is abnormal?
- How to confirm the diagnosis?

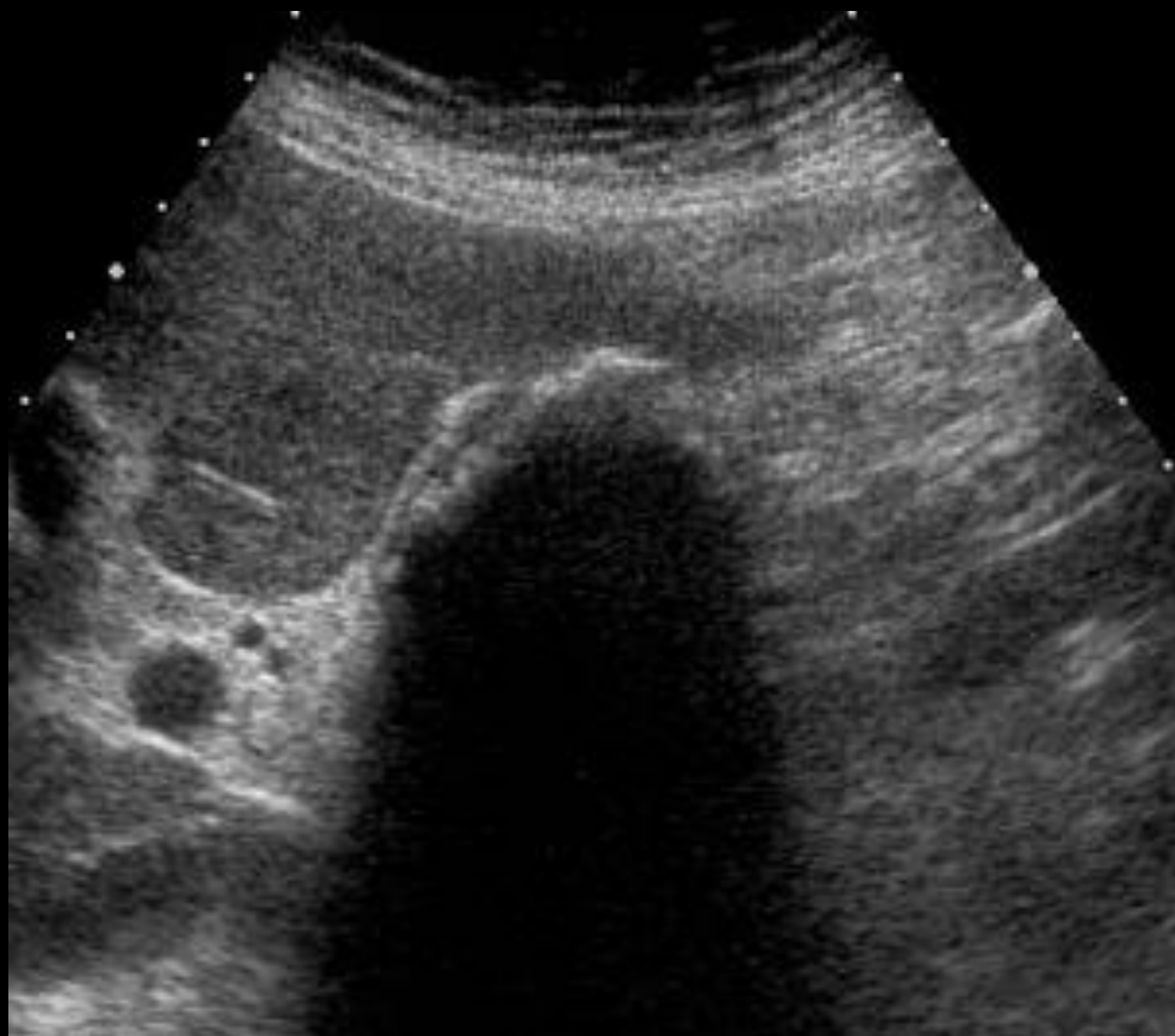


## Gallbladder calcification:

- Porcelain gallbladder (calcification in GB wall).
- Gallbladder stones (NOT common to see on X-ray).

**How to confirm ?**









## Porcelain GB:

- Complete or partial GB wall Ca+.
- Risk of developing cancer 5 -7%.
- Needs follow every year or surgical resection.



# Case 5

50 year-old lady presenting to emergency with **RUQ pain** and **yellow** discoloration of **sclera**, **pale stool** and **dark urine**.

- What is the most likely diagnosis?
- Which radiology modality you prefer to start with ?

Here is US you asked for.....<sup>A</sup>

What do you think ??????

Is it **normal** or **abnormal** ?????



Here is US you asked for.....



**Normal US**



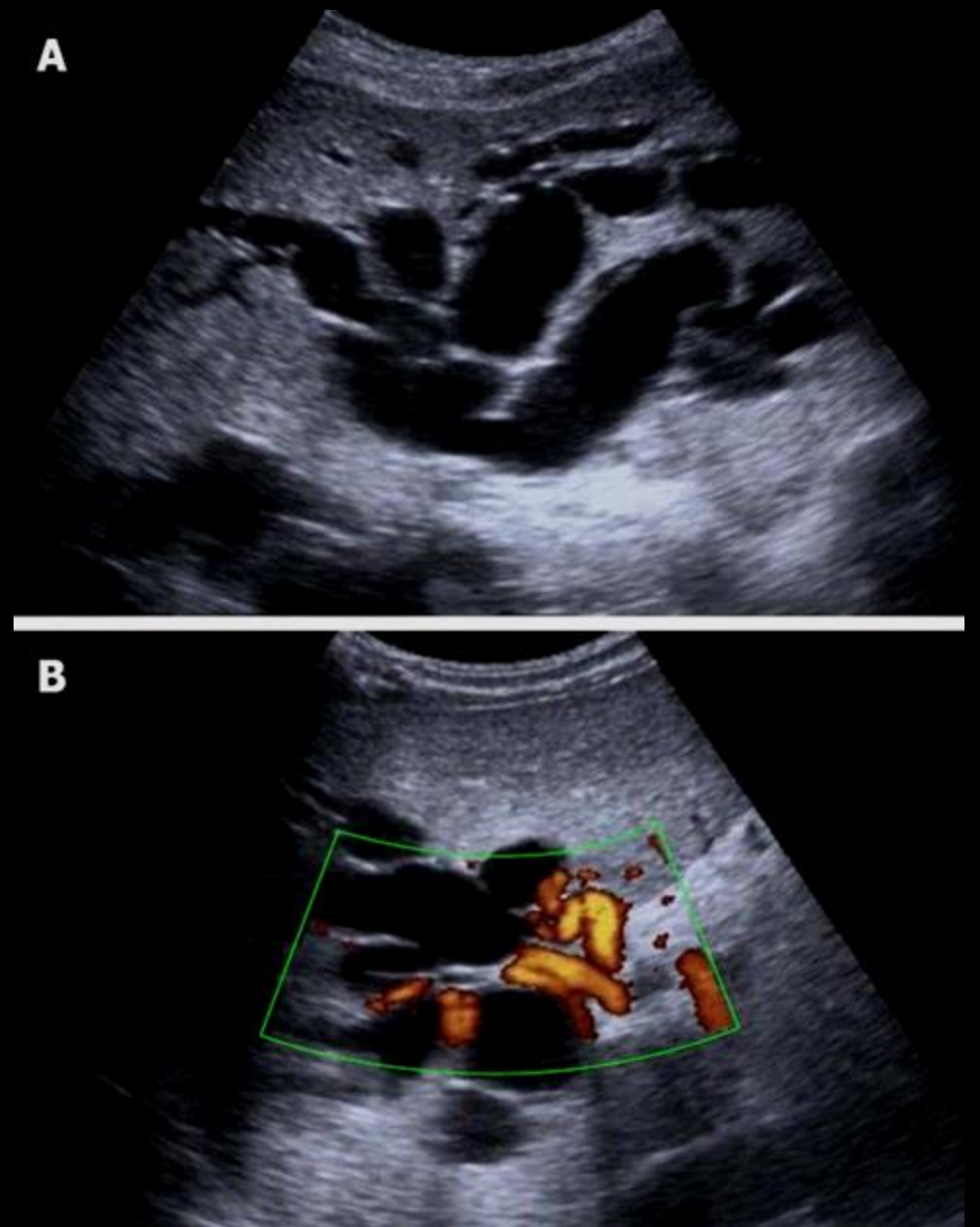
**Abnormal US**

Here is US you asked for.....

Sever intra hepatic **bile duct dilatation**

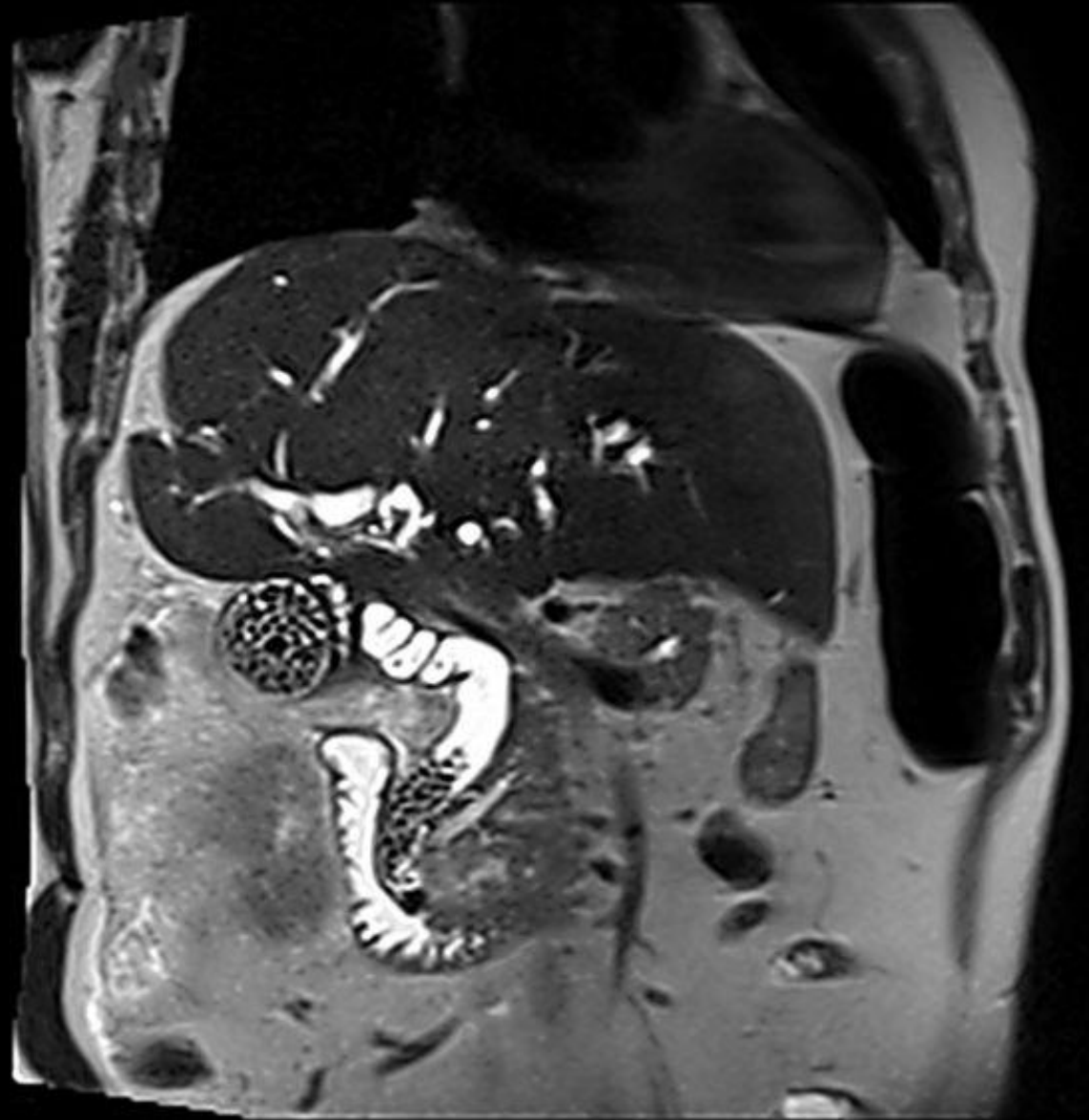
Can you tell the cause from this US???

What to do next?????



# MRI

**What is abnormal?**



# MRI

What is abnormal?

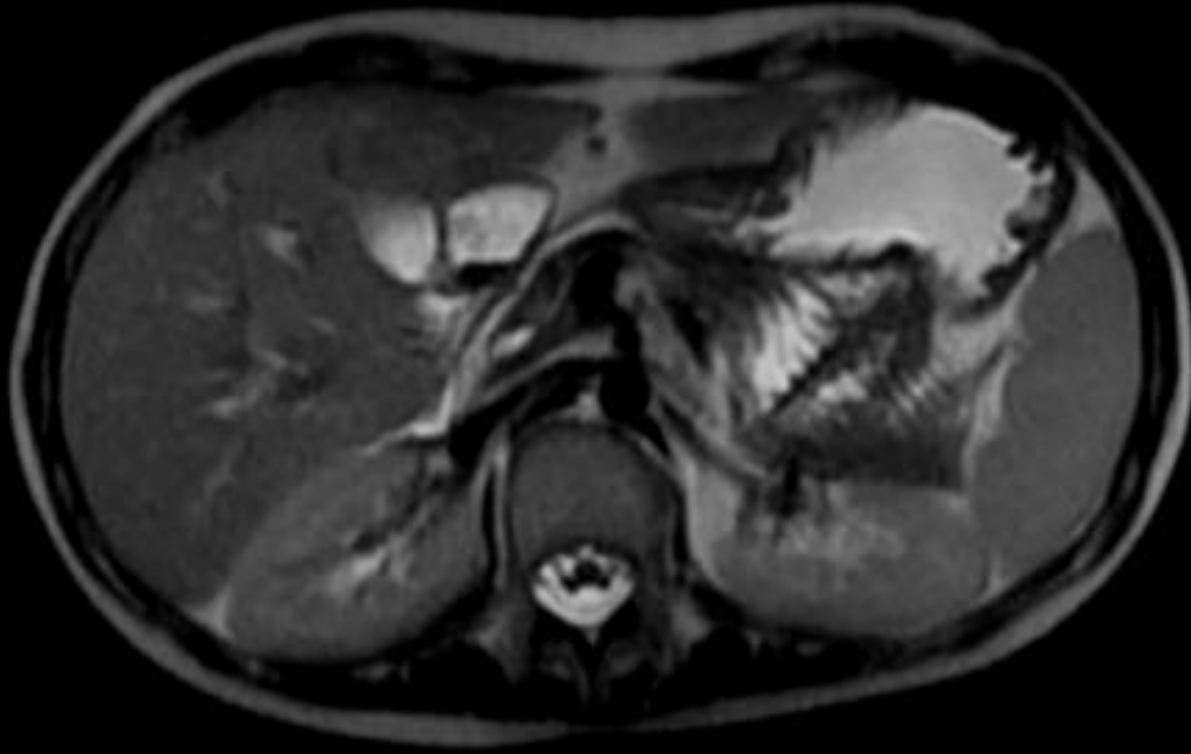
Multiple **gallstones** in GB  
and common bile duct  
(**CBD**).



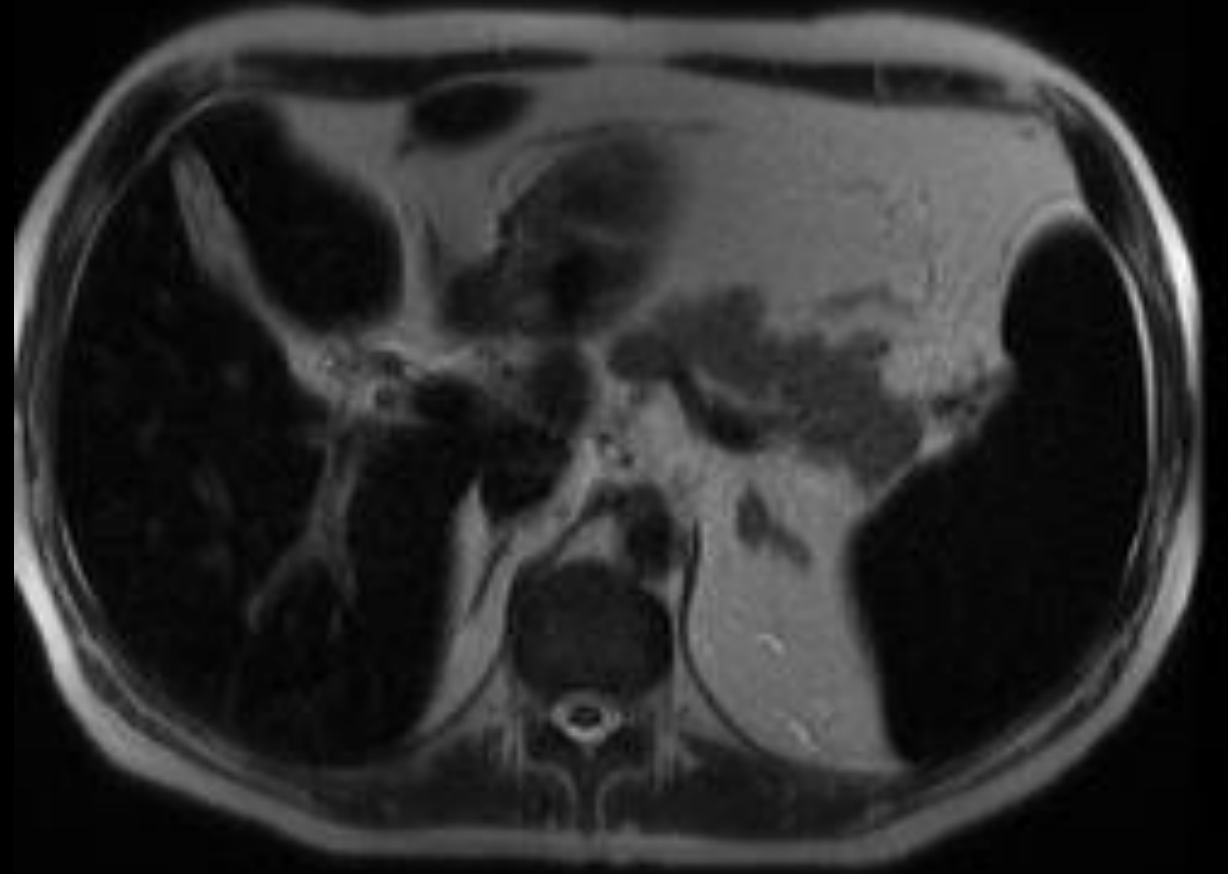


# Case 6

20 year-old case of Thalassemia with repeated blood transfusion



**Normal MRI (for reference)**



**What is abnormal here???**

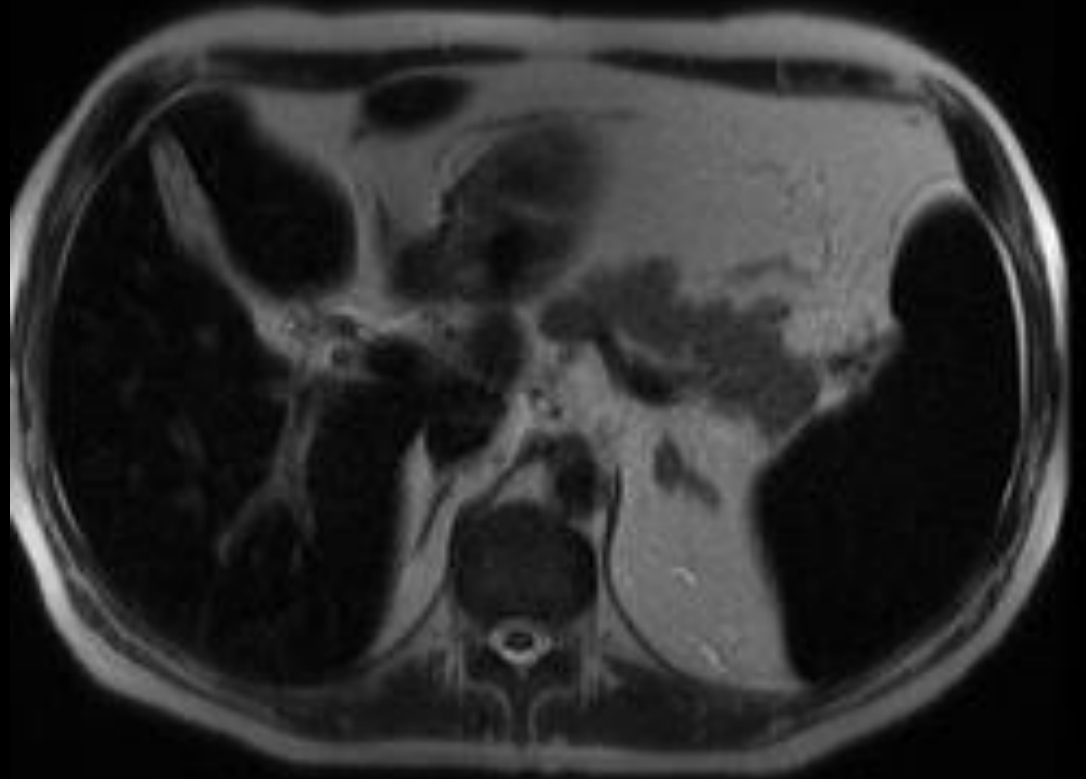
20 year-old case of Thalassemia with repeated blood transfusion

## What is abnormal here???

The liver and spleen of dark in signal (**hypo intense**)

Because of iron overload and repeated blood transfusion.

MRI is the modality of choice to assess and quantify iron in solid organs.



# Case 7

Patient with RUQ pain suspecting  
cholecystitis. US and MRI were not  
conclusive.

What to do next????

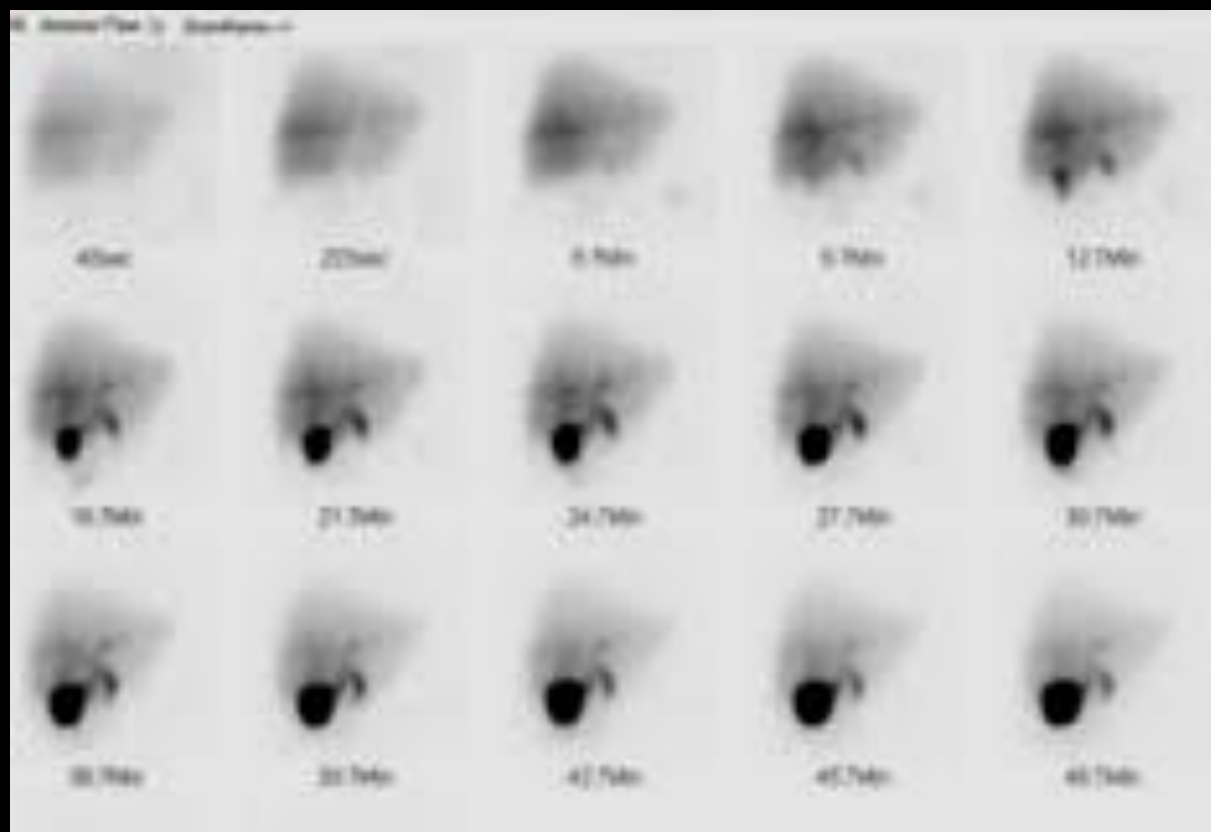
? CT scan ? MRI or ? Nuclear scan.

Patient with RUQ pain suspecting cholecystitis. US and MRI were not conclusive.

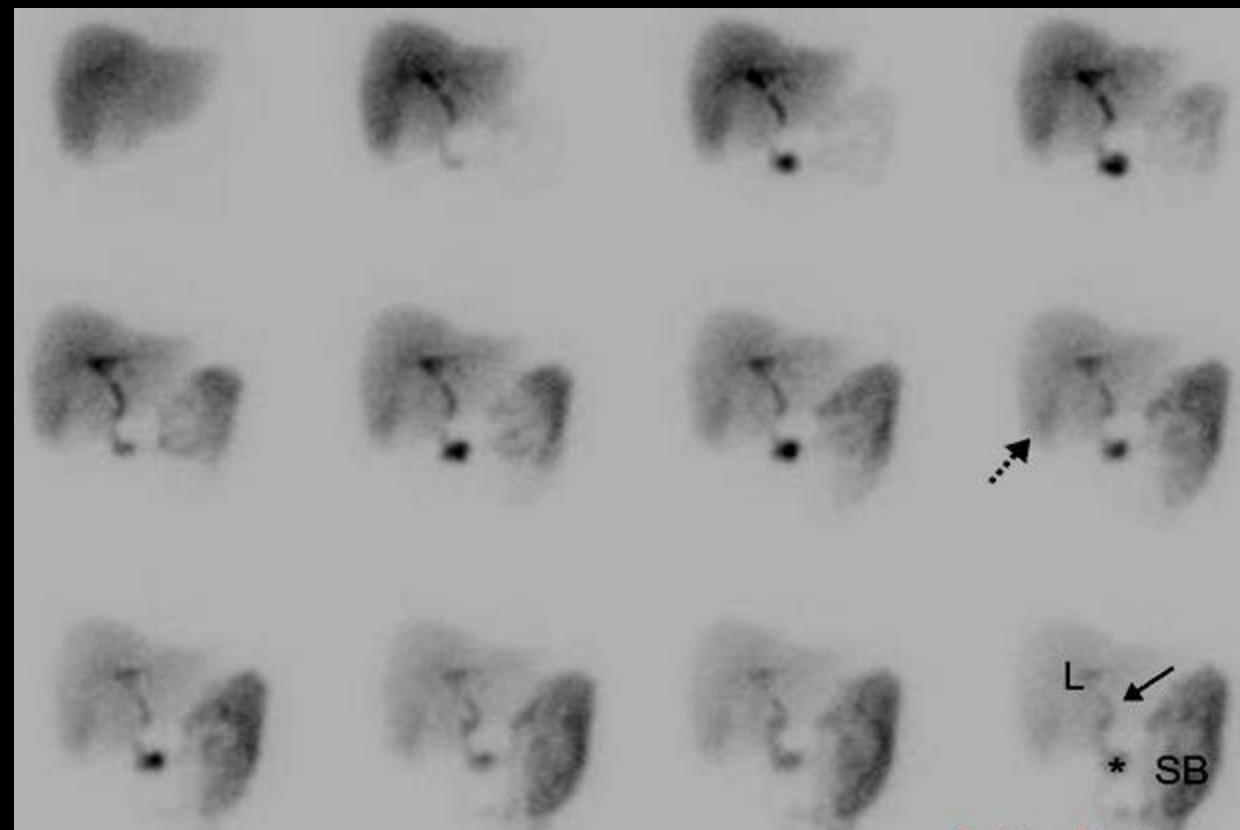
What to do next????

? CT scan ? MRI or ? **Nuclear scan.**

# Nuclear scan (HIDA scan)



**NORMAL (for reference)**



**What is abnormal here???**

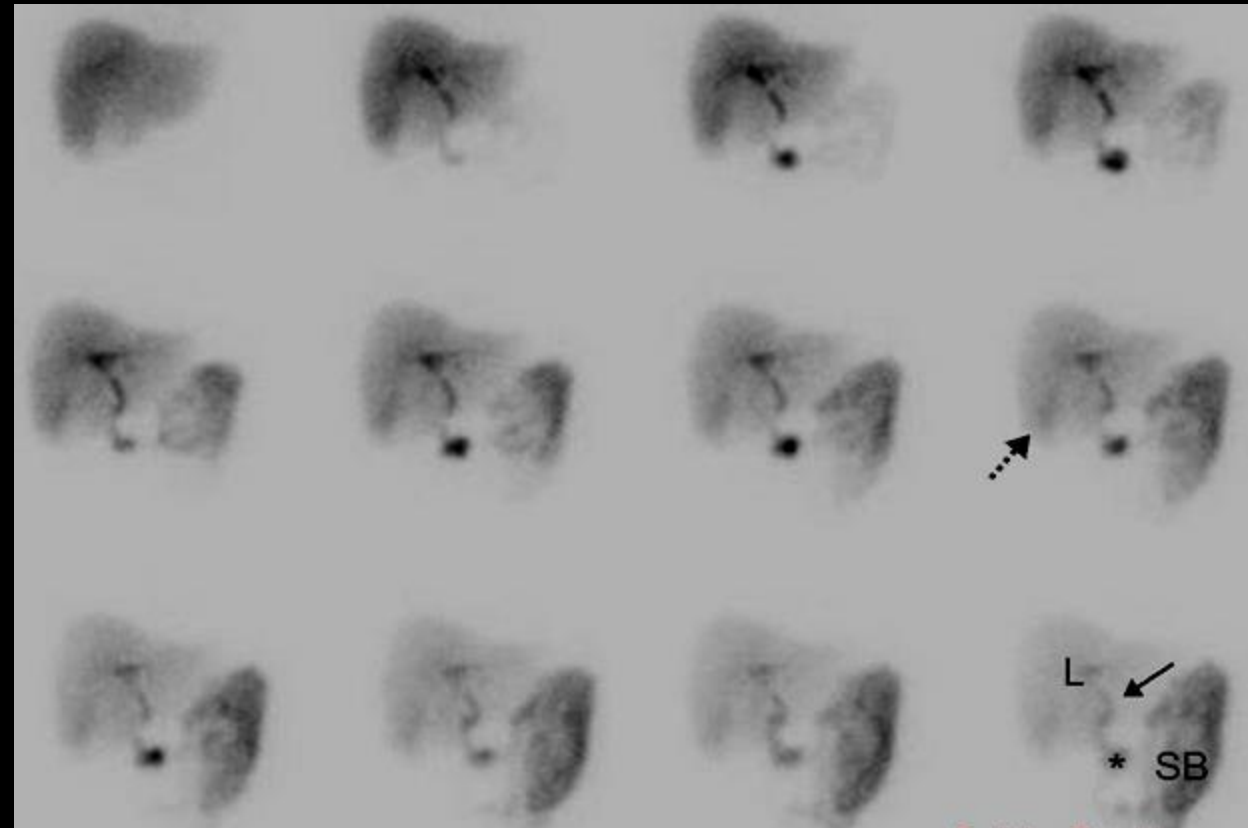
# Nuclear scan (HIDA scan)

## Acute cholecystitis

No up take in gallbladder

### Other indication of HIDA scan:

- Biliary atresia (children)
- Bile injury post surgery.
- Bile obstruction.



**What is abnormal here???**



The End