Thick gallbladder walls, Small gallbladder, Gallbladder in jaundice

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PhD of Medical Imaging

Outline of my presentation

- ✓ **Introduction:**
- ✓ **Thick gallbladder walls.**
- ✓ **Localized thickening.**
- ✓ **Small gallbladder.**
- ✓ **Jaundice.**
- ✓ **Normal bile ducts.**
- ✓ **Gal/bladder in jaundice.**

Introduction:

Thickening of the gallbladder wall is a relatively frequent finding on diagnostic imaging studies. Historically, a thick walled gallbladder has been regarded as proof of primary gallbladder disease, and it is a well known hallmark feature of acute cholecystitis. The finding itself, however, is nonspecific and can also be found in a variety of conditions unrelated to intrinsic gallbladder disease. Diffuse gallbladder wall thickening may produce a diagnostic problem because it occurs in symptomatic and asymptomatic patients and in patients with and those without an indication for cholecystectomy. Misinterpretation of the cause of this imaging finding can lead to an unnecessary cholecystectomy in patients without intrinsic gallbladder disease and, conversely, misdiagnosis in patients who do require a cholecystectomy may result in delayed treatment with increased morbidity. In this essay, we discuss and illustrate the various causes of a thickened gall bladder wall because knowledge of its differential diagnosis is essential for the correct interpretation of this finding.

Introduction:

Sonography, CT, and MRI all allow direct visualization of the normal and thickened gallbladder wall. Traditionally, sonography is used as the initial imaging technique for evaluating patients with suspected gallbladder disease because of its high sensitivity in the detection of gallbladder stones, its real time character and its speed a nd portability However, CT has become popular for evaluating the acute abdomen and often is the first technique to s how gallbladder wall thickening or CT may be used as an adjunct to an inconclusive sonography examination or for staging of disease. The potential value of MRI in the evaluation of gal lbladder disease but it still plays little role.

Introduction:

The normal gallbladder wall appears as a pencil thin echogenic line on sonography and is usually visible on CT as a thin rim of soft tissue density that en hanc es after contrast injection The thickness of the gallbladder wall depends on the degree of gallbladder distention, and pseudothickening can occur in the postprandial state A thickened gallbladder wall measures more than 3 mm, typically has a layered appearance at sonography and frequently contains a hypodense layer of subserosal edema that mimics pericholecystic fluid at CT

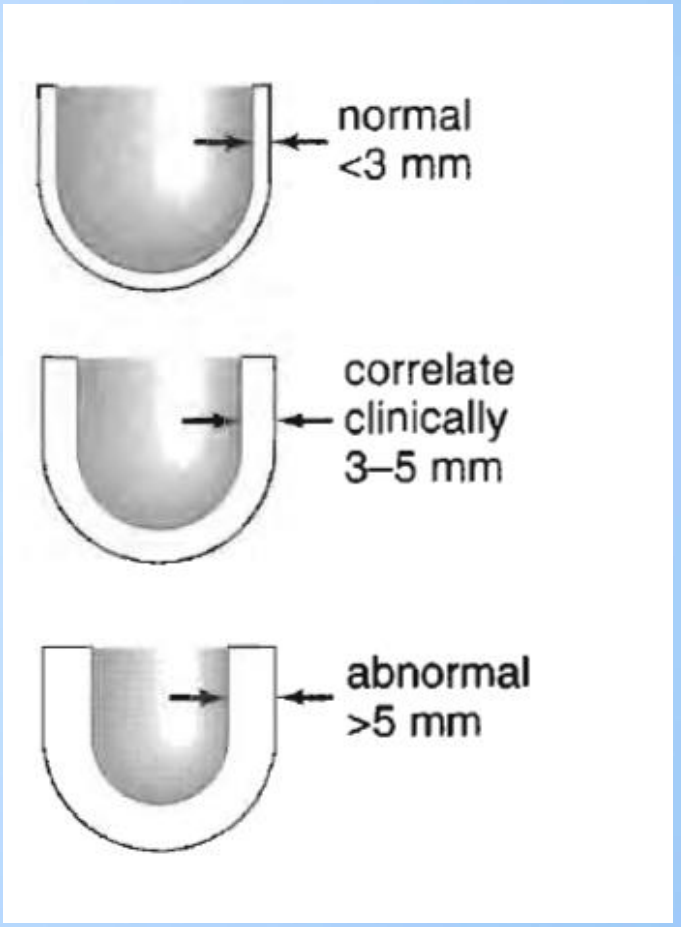
Thick gallbladder walls

Generalized thickening

The thickness of the gallbladder wall is nonnally less than 3 mm and should not exceed 5 mm. When the thickness is between 3 mm and 5 mm, careful clinical correlation is needed. Generalized thickening of the gallbladder wall can occur in the following conditions:

1. Acute cholecystitis. This may be associated with an echo-free section in the wall or a localized fluid collection. Stones may be present: check the neck of the gallbladder .

2. Chronic cholecystitis . There may also be stones .



Thick gallbladder walls
Generalized thickening

3. Hypoalbuminaemia resulting from cirrhosis. Check for ascites, dilated portal veins and splenomegaly.

4. Congestive cardiac failure (Fig. 65b). Check for ascites, pleural effusions, and dilated inferior vena cava and hepatic veins . Examine the patient.

5. Chronic renal insufficiency. Examine the kidneys and the urine.

6. Multiple myeloma. Laboratory tests are necessary.

7. Hyperplastic cholecystosis. This is usually asymptomatic. AschoffRokitansky sinuses are best seen on oral cholecystography, occasionally with ultrasound.

8. Acute hepatitis.

9. Lymphoma.

Thick gallbladder walls
Generalized thickening

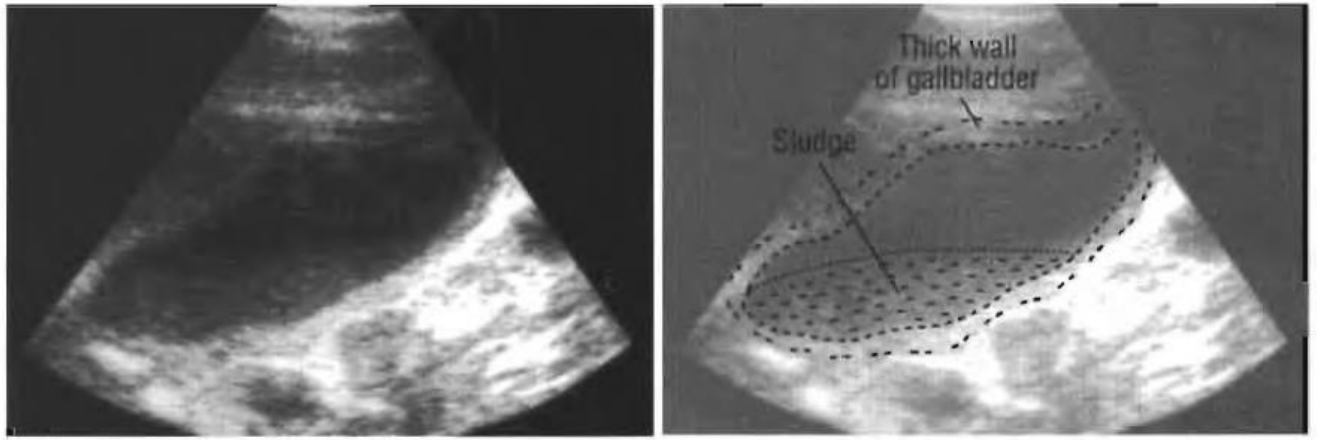


Fig. 65a. A gallbladder with thick walls due to chronic cholecystitis: the bile is thickened, forming sludge.

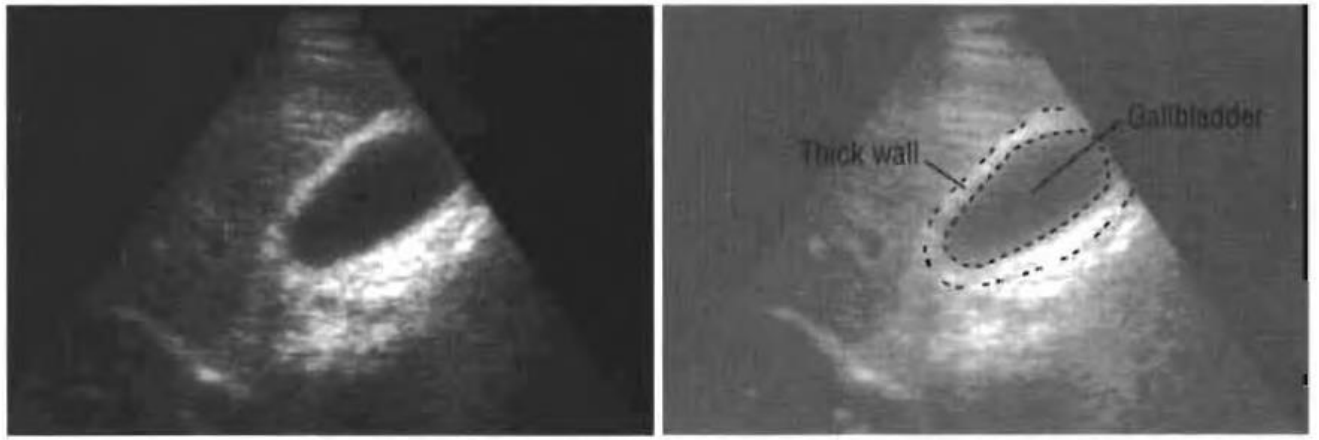


Fig. 65b. A small gallbladder with thick walls in a patient with cardiac failure.

Localized thickening

Local thickening of the gallbladder walls may be due to the following:

1. Mucosal folds. There may be several together. Scan in different positions: pathological thickening (more than 5 mm in any area) will not alter with the position of the patient, but folds will vary in
thickness and position (Fig. 65c).

2. Polyp. There will be no movement with a change in the patient's position (Fig. 65d), but the shape may alter.

3. Primary or secondary carcinoma ofthe gallbladder. This appears as a thick, irregular, solid intramural mass, localized and not changing with the patient's position (Fig. 65e).

Localized thickening

Fig. 65c. A mucosal fold in the gallbladder. Rescanning in different positions, or after an interval, is essential to establish the correct diagnosis.

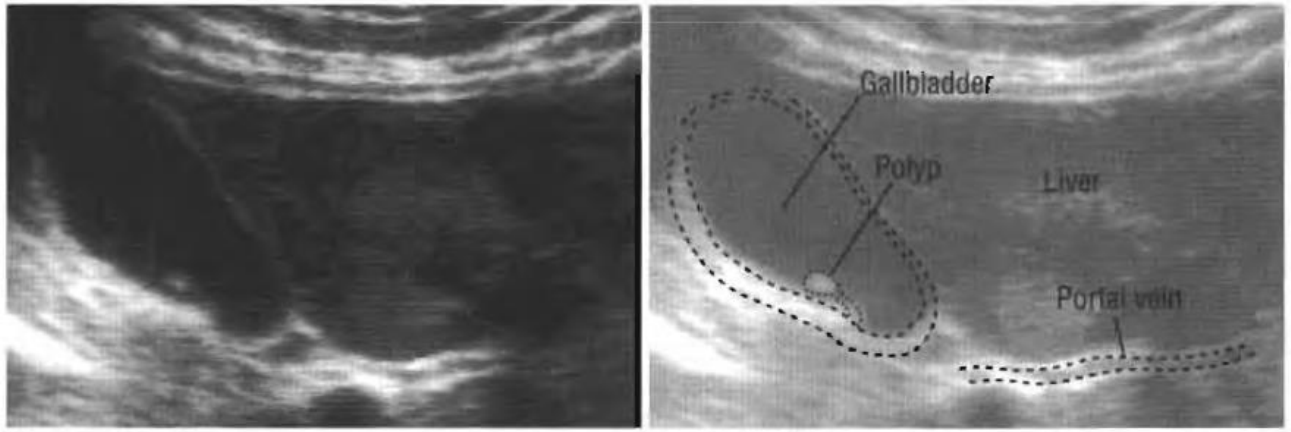


Fig. 65d. A small pedunculated polyp. This will not move but may alter its shape when the patient is scanned in a different position.

Localized thickening

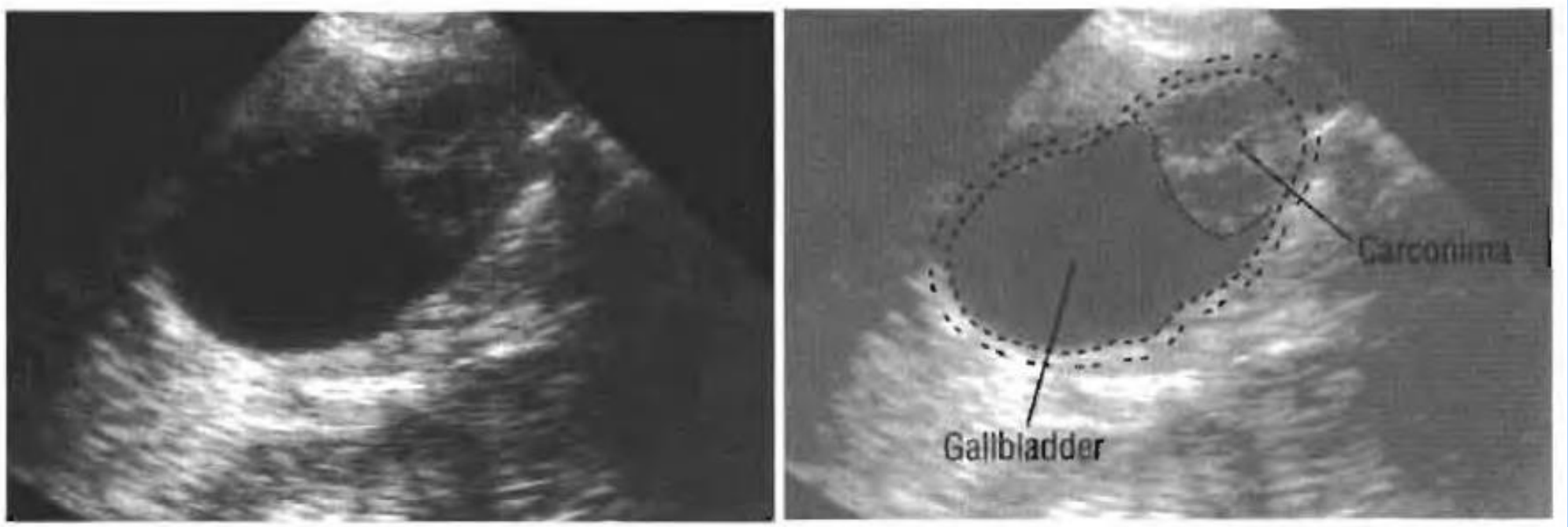
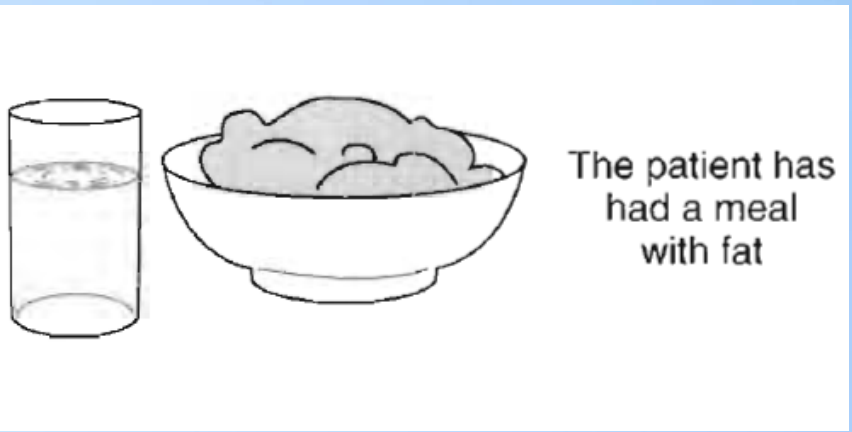


Fig. 65e. Carcinoma of the gallbladder.

Small gallbladder

1. The patient may recently have had a meal containing fat and the gallbladder has
contracted.
2. Chronic cholecystitis: check for thickened gallbladder walls and for gallstones within
the gallbladder (Fig. 66a) .



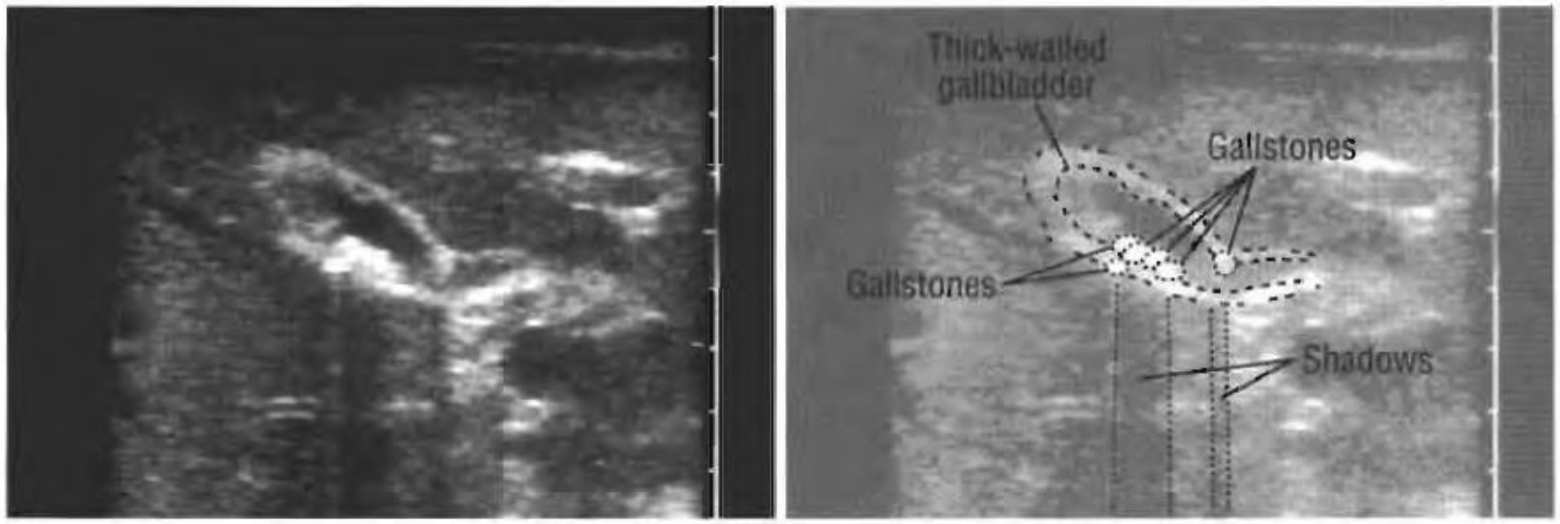


Fig. 66a. A small thick-walled gallbladder containing several stones.

Small gallbladder

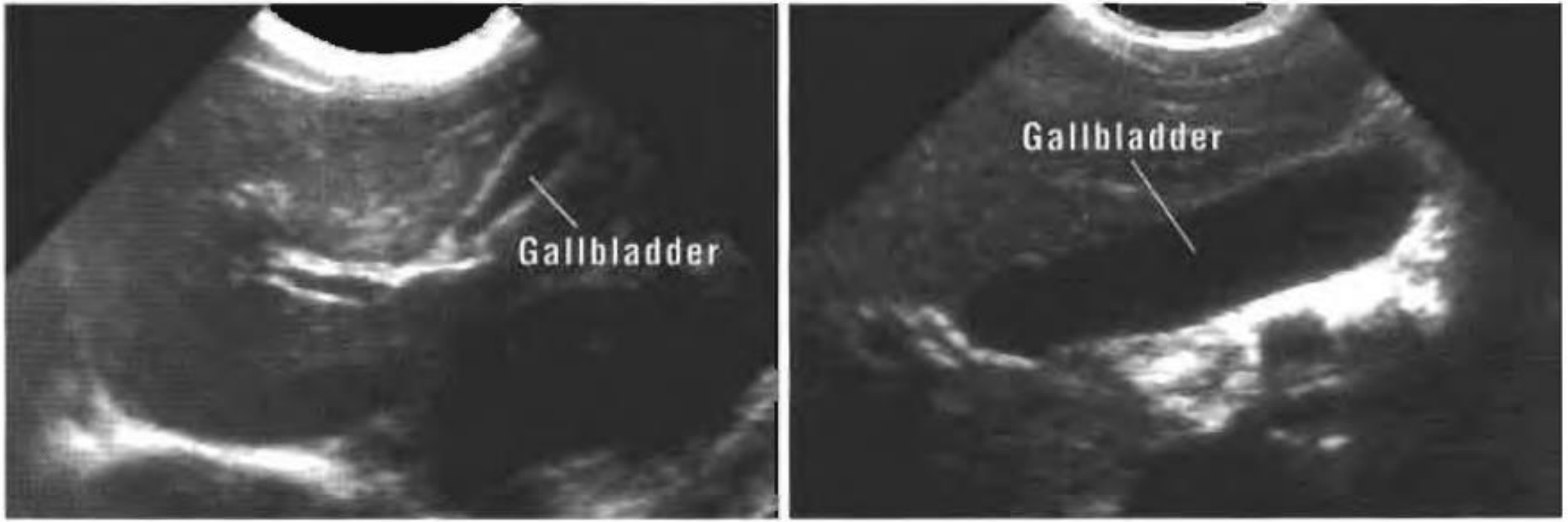


Fig. 66b. A normal gallbladder is small when empty (left) and will be much larger when full (right).

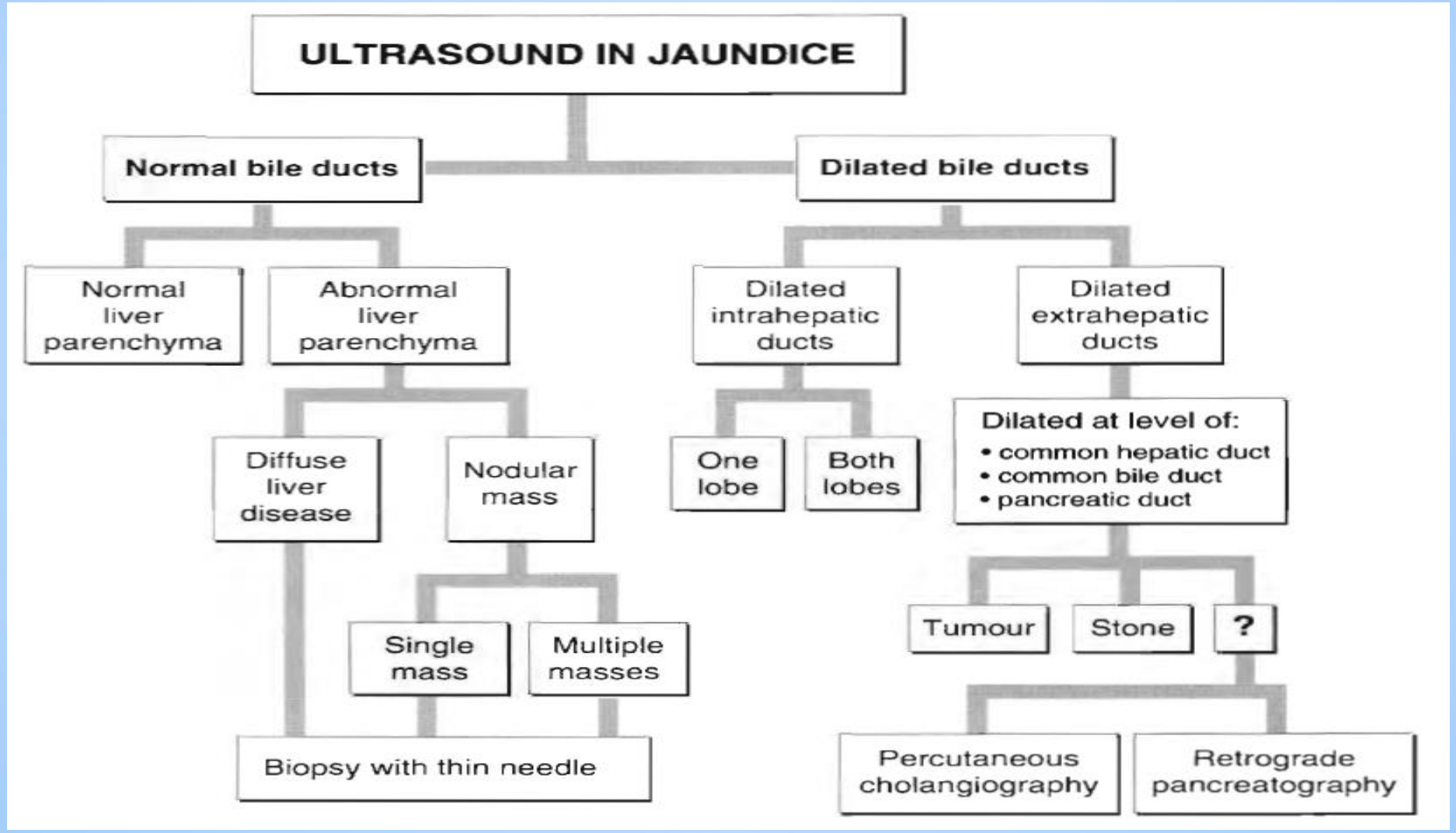
Small gallbladder

If the gallbladder is small, re-examine after 6–8 hours (without food or drink) to differentiate between an empty gallbladder and a contracted gallbladder. The normal gallbladder will fill up after a few hours and appear normal in size.

Jaundice

When the patient is jaundiced, ultrasound can usually differentiate between non-obstructive and obstructive jaundice, by showing the dilatation of the biliary system. However, the exact cause of the jaundice may be difficult to identify.

Jaundice


ULTRASOUND IN JAUNDICE
Normal bile ducts
Dilated bile ducts
Normal liver parenchyma
Abnormal liver parenchyma
Dilated intrahepatic ducts
Dilated extrahepatic ducts
Diffuse liver disease
Nodular mass
One lobe
Both lobes
Dilated at level of:
• common hepatic duct
• common bile duct
• pancreatic duct
Single mass
Multiple masses
Tumour
Stone
?
Biopsy with thin needle
Percutaneous cholangiography
Retrograde pancreatography

Jaundice

When the patient is jaundiced, ultrasound can provide information about the gallbladder and the biliary ducts, and can usually differentiate between obstructive and non-obstructive jaundice, but does not always show the exact cause.

In every jaundiced patient, scan the liver, the biliary tract and both sides of the upper abdomen.

Normal bile ducts

- Extrahepatic ducts. It may be difficult to see the extrahepatic bile ducts.

- Intrahepatic ducts. The intrahepatic ducts are best seen on the left side of the liver in deep inspiration. It is not easy to see the normal intrahepatic ducts on ultrasound because they are often too small and thin-walled.

• Maximum diameter of normal common hepaticduct: less than5 mm

• Maximum diameter of normal common bileduct: less than 9mm

• Maximum diameter of common bile duct post-cholecystectomy:10-12mm

Sometimes following surgery, and in patients over 70 years of age, the common bile duct may be a few millimetres wider (i.e. 12-14 mm). Add 1 mm to all of the measurements above for each decade over 70 years of age.

Normal bile ducts

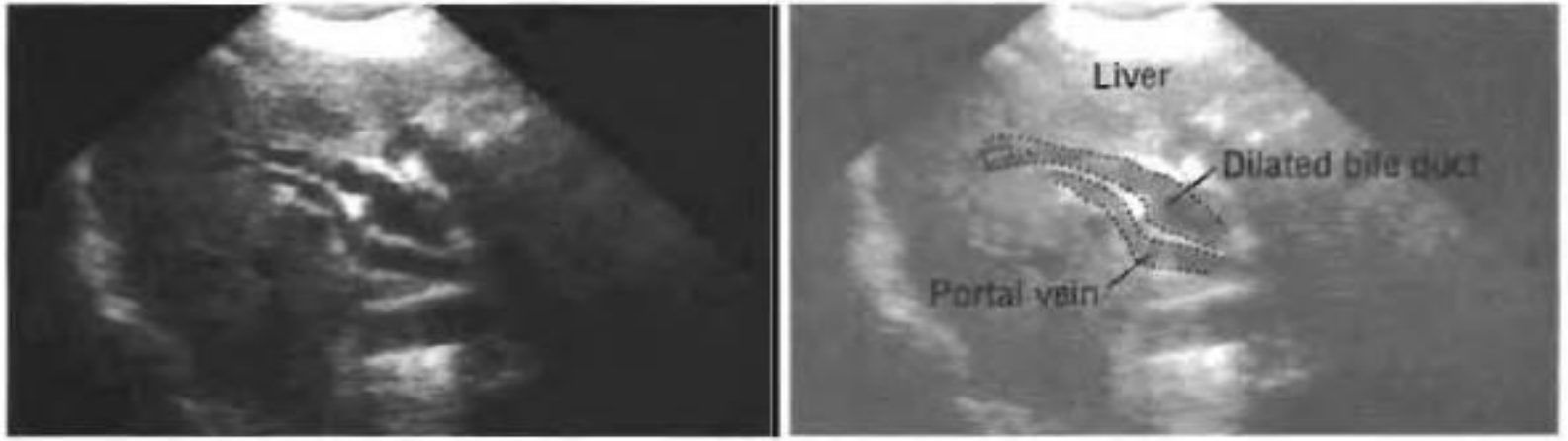


Fig. 67a. Dilated extrahepatic bile ducts.

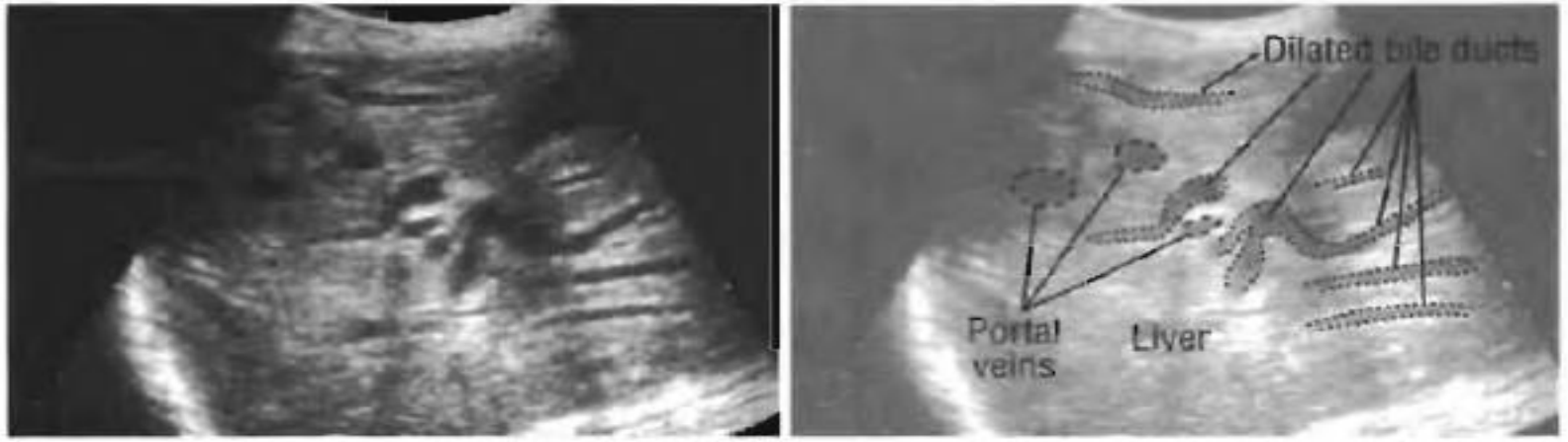


Fig. 67b. Dilated intrahepatic bile ducts.

Gallbladder in jaundice

1. If the gallbladder is distended, the obstruction usually affects the common bile duct (e.g. calculus, Ascaris,pancreatitis or carcinoma). The hepatic ducts will also be distended.
2. If the gallbladder is not distended or is very small, obstruction is unlikely or the obstruction is above the level of the cystic duct (e.g. enlarged lymph nodes or tumour near the porta hepatis).

Ultrasound can diagnose gallstones in the gallbladder but is not always reliable in recognizing stones in the common bile duct. Clinical judgement must be used, especially in the jaundiced patient.

Gallbladder in jaundice

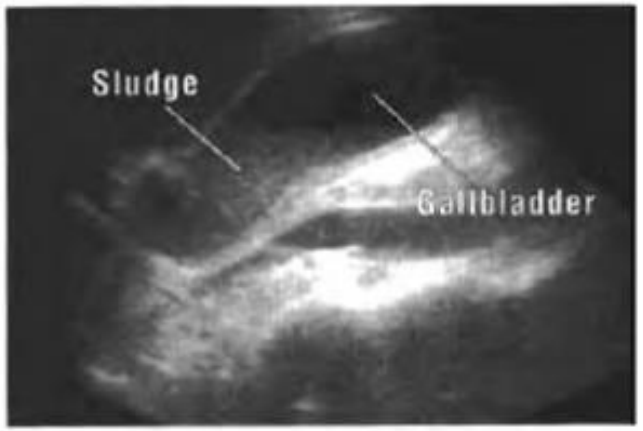


Fig. 68a. A distended gallbladder.

Fig. 68b. A small gallbladder with distended bile ducts (due to an enlarged lymph node at the porta hepatis).

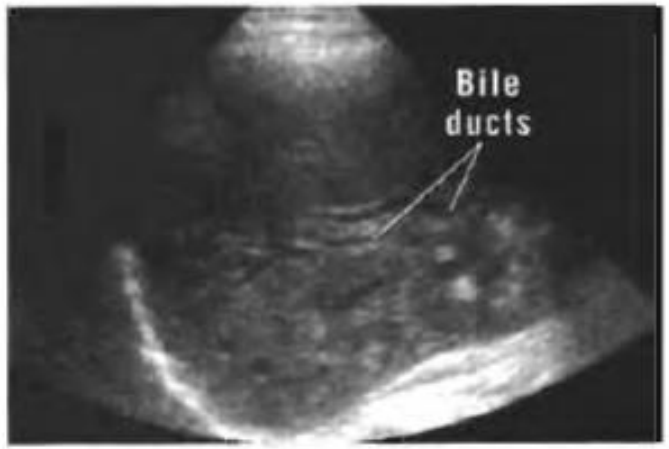


Fig. 68c. Mildly dilated bile ducts.

Fig. 68d. Dilated common bile duct containing a gallstone.

Thank you