

ULTRASOUND OF LIVER AND GALLBLADDER

GIT Block; Radiology

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Outline



Color Guide:

- **Red:** Relatively important.
- **Black:** Slides.
- **Green:** Doctor's notes.
- **Blue:** Extra information.
- **Orange:** Explanation.

What's Ultrasound?

- A diagnostic technique in which **high-frequency sound waves** penetrate the body and produce multiple echoes; these echo patterns can be viewed as an image on a computer screen.
- Frequency ranges used in medical Ultrasound imaging are: 2 - 15 MHz.

Remember!

Hyper-echoic = White
 Hypo-echoic = Light Grey
 An-echoic = Black

Types of Ultrasound images:

Type	B-mode image	Doppler ultrasound	Ultrasound Elasticity Imaging	3D ultrasound
Displays:	A two-dimensional cross-section of the tissue being imaged. (gray mode)	<ul style="list-style-type: none"> • Blood flow. • Motion of tissue over time. • The location of blood. • The presence of specific molecules. 	The stiffness of tissue.	The anatomy of a three-dimensional region.

Duplex ultrasonography	<p>It incorporates two elements:</p> <ol style="list-style-type: none"> 1. Grayscale Ultrasound: to visualize the <u>structure</u> or architecture of the body part. (No motion or bloodflow is assessed) 2. Color-doppler Ultrasound: to visualize the <u>flow</u> or movement of a structure, typically used to image blood within an artery
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Uses	Advantages	Disadvantages	Indications
<ul style="list-style-type: none"> • Cardiology. • Emergency Medicine. • Gynecology. • Neonatology. • Neurology. • Urology. • Musculoskeletal. • Obstetrics: (sonography) • Vascular system. • Gastroenterology: (sonography) 	<ul style="list-style-type: none"> • Inexpensive. • Easy and available. • Safe and no radiation. 	<ul style="list-style-type: none"> • <u>Inability to penetrate gas or bone.</u> • Operator dependent. • Less sensitive in some situations. 	<ul style="list-style-type: none"> • Right upper quadrant pain. • Jaundice. • High liver function test. • Fever work up. • Screening for metastasis.

Causes of:

Hepatomegaly (> 15 cm)	Small shrunken liver (< 9 cm)
<ul style="list-style-type: none"> • Infection: eg viral hepatitis • Neoplasm (tumor): eg. metastasis • Cirrhosis: <u>early</u> phase • Metabolic: Amyloidosis /fat • Drugs/toxins: alcohol • Others: Budd Chiari syndrome 	<ul style="list-style-type: none"> • <u>Late</u> cirrhosis (<i>Shrunken size & Irregular outline</i>) • Ascites • Portal hypertension

Diffuse abnormality:

• More than normal (**more white**)
e.g. Diffuse fatty infiltration

• Less than normal (**more black**)
e.g. infection: Acute hepatitis

(Infection = edema/fluid = appears black)



Pathology of gallbladder

Intra-luminal pathology.	Mural pathology.
<ul style="list-style-type: none">• Gall stones show → Acoustic shadowing• Polyps show → <u>No acoustic shadowing.</u>	<ul style="list-style-type: none">• Primary:<ul style="list-style-type: none">• Cholecystitis.• Secondary:<ul style="list-style-type: none">• Cardiac failure.• Cirrhosis.• ascitis• Hypoalbuminaemia• Renal failure.

Additional notes

- In case of any liver/gallbladder pathology, we begin with **Ultrasound**.
- **Fluid** → **An-echoic (black)**
- **Fat** → **Hypo-echoic (gray)**
- Normally, veins are an-echoic (black) but when gray → **thrombus**.

