Liver scanning

Anatomy:

The liver is the largest organ in the body. It is situated in the right upper quadrant (RUQ) and the left lobe extends beyond midline to the left upper quadrant (LUQ).The size and shape of liver is variable.

The liver is divided into lobes:

Right lobe.

Left lobe.

Caudate lobe.

Quadrate lobe.

The right lobe is the biggest lobe and it is anterior to the gallbladder, right kidney, right adrenal gland and head of the pancreas.

The left lobe is anterior to the stomach (gastroesophageal junction) and body of pancreas.

The right lobe is separated from the left lobe by ligamentum teres and the left lobe separate from the caudate lobe by ligamentum venosum (landmark).

There is a landmark between the gallbladder and portal vein called main lobar fissure.

Vessels:

1-hepatic veins:

Drain in the IVC (carry the blood from the liver to the IVC).there are (right, mid and left) veins.

2-hepatic arteries:

Coming from aorta (carry blood from aorta to the liver).there are (right, mid and left) arteries.

3-portal vein.



Appearance:

The lobes of the liver are mid grey.

The vessels are anechoic(black)except the portal vein has an echogenic wall because it is a combination of 3 vessels and the wall is made of fiber, muscle and fat(fibro fatty tissue)(thick wall).

Patient preparation:

Patient should be fasting (8-12) hrs. Before examination, to reduce gases and because liver scanning always involve examining the gallbladder which require fasting (it contract and empty the bile when eating) so we can’t see it.

Probe:

(2-5) MHz probe is used.

Patient position:

Supine is the most common position and probe moving subcostal (below the rib) or intercostal (between the ribs).

Left lateral oblique and prone position may be done.

Breathing technique:

Deep held inspiration.

Procedure:

1. After doing longitudinal scan of the liver we start to do transverse scan at the same position (supine).

2. Probe is transverse at the midline below xphiod process with gentle pressure (we see the left lobe of the liver and pancreas): the left lobe and pancreas have the same echogenicity (mid grey).

3. Move the probe subcostal and little to the right until we see caudate lobe, ligamentum terse and ligamentum venosum.

We see: ligamentum terse and ligamentum venosum as a bright line (echogenic line –hyper echoic).

(Ligamentum terse is between the left and right lobe of the liver and ligamentum venosum is between left and caudate lobe).

4. To see the right lobe of the liver we start scanning by moving the probe subcostal from midline and then move it to the right side along the costal margin (we can see also the portal vein which has on echogenic wall-hyper echoic).

5. We move the probe to the most right lateral side of the patient (at inferior edge of the right costal margin) we can see the right lateral inferior lobe of the liver with right kidney.

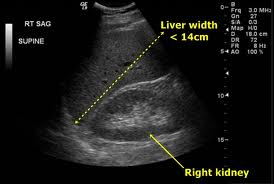
We see: the cortex of kidney is hypo echoic than the liver.

6. By moving the probe intercostaly we can see the right lateral superior love of the liver.

7. To see the IVC with its three branches ( right, mid and left) we change the position of the patient to the oblique position (left posterior oblique ) and return the probe to the midline below xphoid process and move it subcotaly to the right until we see the veins. We can see the veins and IVC (anechoic-black).

(We can do it also in supine position).

During the examination we have to ask the patient to take a deep held inspiration at several times).



Liver measurement



Figure shows the difference between kidney and liver echogenicity