

Investigations used to reach the diagnosis in liver disease

1) Liver function test

This include serum bilirubin, S. alkaline phosphatase, serum GOT, serum GPT, serum gama glutamyl transpeptidase, serum albumin & prothrombin time.

- GOT & GPT to detect liver injury associated with acute alcohol ingestion.
- The synthetic functions of the liver are reflected in the ability to synthesize protein (albumin levels) & clotting factors (prothrombin time).
- The standard method of monitoring liver function in chronic liver disease is serial measurements of bilirubin, albumin & prothrombin time.

2) Imaging studies of the liver disease include:

- Ultrasound * CT Scan * MRI * ERCP
- Percutaneous transhepatic cholangiography * Angiography
- Nuclear medicine scanning * Laparoscopy & laparoscopic ultrasound.

❖ Ultrasound

It is the first line imaging study owing to it's availability. It is useful for: 1) determine ductal dilatation 2) the presence of gall stone. 3) Presence of liver tumour 4) Doppler ultrasound allows assessment of flow in the hepatic artery, portal vein & hepatic veins.5) Guiding percutaneous biopsy of liver lesion.

❖ CT Scan

The current gold standard for liver imaging is triple phase multislice spiral computerized tomography. It can show:

- 1) it can shows fine details of liver lesion down to < 1cm & give information of their nature
- 2) oral contrast enhancement allows visualization of the stomach & duodenum in relation to the liver hilum
- 3) the intravenous early phase contrast vascular enhancement is useful for detecting small liver tumor owing to its preferential blood supply
- 4) venous phase, map branches of part vein with in the liver & drainage via the hepatic veins.
- 5) Inflammatory liver lesions exhibit rim enhancement with intravenous contrast.
- 6) Haemangioma characteristically shows late venous enhancement
- 7) the density of any liver lesion can be measured, so can show cystic lesion.

❖ MRI.

It has the following advantages:

- 1) Preclude the use of iodine containing contrast agent.
- 2) MR cholangiography has excellent quality imaging of the biliary tract non invasively.
- 3) For diagnostic purposes when ERCP has been failed or impossible.
- 4) MR angiography provides high quality imaging of the hepatic artery & portal vein with out the arterial cannulation.

ERCP (endoscopic retrograde cholangiopancreatography)

This indicated for patient with obstructed pattern of liver function test & for patient with an abnormality of the biliary tract.

Advantages are 1) Stone retrieval from the common bile duct.

- 2) Balloon dilatation of CBD stricture
- 3) Endoprosthesis insertion.
- 4) For taking brush cytology of CBD tumour.

- 5) Endoluminal ultrasound is useful for the biliary tract tumour showing the extent of hilar tumour.
- 6) For sphincterotomy.

Percutaneous transhepatic cholangiography (PTC)

It is used when 1) When endoscopic cholangiography is failed or impossible 2) In patients with hilar bile duct tumour in whom endoscopic cholangiography fails to visualize the intrahepatic bile ducts.

Angiography

- 1) It visualizes the anatomy of the hepatic arteries & confirms the patency of the portal vein. 2) Provide information on the nature of liver nodule as primary liver tumours have well developed blood supply. 3) Therapeutic advantages include occlusion of arteriovenous malformation, embolisation of bleeding site & chemoembolisation of liver tumour.

Nuclear medicine scanning

This includes:

- **Technetium 99 labeled imino diacetic acid** given intravenously.

It is useful for detecting bile leak or when biliary obstruction is suspected

- **Sulphur colloid liver scan**

It allows the kuppfer cell activity to be determined. It is useful to confirm the nature of liver lesion.

Adenoma & haemangioma having lack of kuppfer cells hence, no uptake of sulphur colloid.

- **Fluorodeoxyglucose position emission tomography**

It depends on the avid uptake of glucose by cancerous tissue in comparison with benign or inflammatory lesion.

- **Laparoscopy & laparoscopic ultrasound.**

- 1) It is useful for staging hepato-pancreatico-biliary cancer.
- 2) Can show peritoneal metastases & superficial tumours of the liver.
- 3) Laparoscopic ultrasound provides an additional advantage by giving information on liver tumours and their proximity to the major vessels & bile duct branches.

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