

Ultrasonography, portal hypertension and trainee doctors

Point of care ultrasound is using ultrasound right at the place where patient is available-ward, out-patient department, intensive care unit, emergency room etc. Point of care ultrasound is performed by the treating physician, surgeon, gynaecologist and not necessarily by a radiologist. Senior faculty member may find it difficult to perform ultrasound, as this technology was not available during their training period. When laparoscopic cholecystectomy was introduced, senior surgeons had great reservations for it and the young trained surgeon were at ease performing lap cholecystectomy. Open cholecystectomy is rarely performed today. So is the case with ultrasound. Ultrasound equipment is increasingly become more miniaturised, hand-held, palm size and even wireless. With these advances in ultrasonography, it is most important the trainee doctor, medical students are introduced to ultrasound images and taught the very basic of ultrasound. The time has come that medical students-under-graduates and post-graduates- are well knowledgeable with the newer 'sonoscope', in a manner similar to they acquire skills of using a stethoscope (a scope in name only).

Hepatitis-C is a major liver disease in our country. It leads to liver cirrhosis due to parenchymal fibrosis resulting in increased resistance to the passage of portal blood inside the liver. This leads to portal hypertension and the portosystemic anastomosis. Ultrasound is an accurate, non invasive means of diagnosis of portal hypertension.

Ultrasonographic appearance of the Liver in Cirrhosis.

The liver becomes shrunken, nodular with irregular margins. There is increased parenchymal echogenicity and nodularity on the surface of the liver. A nodular liver with increased echogenicity has a diagnostic accuracy of portal hypertension in 70% or more. There is atrophy of the right lobe (segments 5,6,7 & 8) and medial segment of the left lobe (quadrate lobe) with hypertrophy of the lateral segments of the left lobe (segments 2,3) and caudate lobe,1)

Porto systemic anastomosis

Oesophageal Varicies- these form because of anastomosis between oesophageal branches of azygos vein(systemic component)and oesophageal branches of the left gastric veins (portal component). They are around the lower end of the oesophagus and can result in rupture with massive haematemesis

Ultrasonography is very convenient, non-invasive and most economical when it comes to diagnosis of Liver Cirrhosis and portal hypertension. The liver nodularity, splenomegaly, portal and splenic vein dilatation, splenomegaly, portosystemic anastomosis are identifiable. With early diagnosis, treatment may offer better chances of cure or preventing complications if not curable.

The emphasis here is doing ultrasound by oneself rather than sending the patient to a ultrasonographer. The case may be referred to the



Figure 1: Nodular shrunken liver

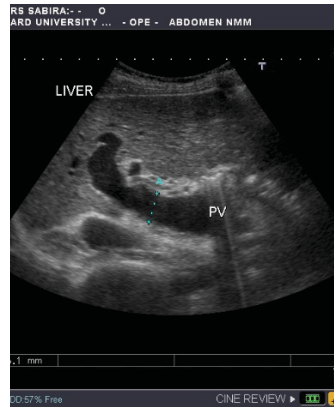


Figure 2: Porta Vein Distension. Portal vein dilated greater than 13 or 15 cms have a sensitivity of only 40%. The size of Portal vein increasing with deep inspiration is more sensitive, though rarely assessed.



Figure 3: Splenomegaly: With increase congestion in the splenic vein, spleen enlarges too. Splenomegaly with a length of >11 cms is another diagnostic sign, with accuracy of about 80%. This spleen measured 17.6cms



Figure 4: Splanchnic Veins. Enlarged Splanchnic veins e.g superior mesenteric and splenic veins diameter of more than 1 cm are suggestive of portal hypertension. This photograph shows the enlarged distended confluence where splenic and superior mesenteric vein joins to form the portal vein

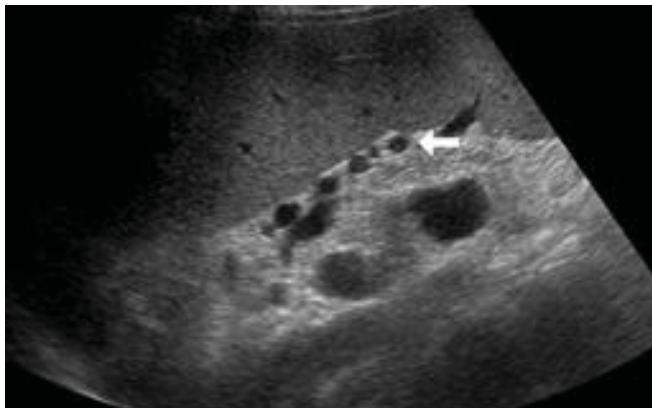


Figure 5: Oesophageal varices. The arrow points to dilated oesophageal varicosities. Can be recognised, once kept in mind

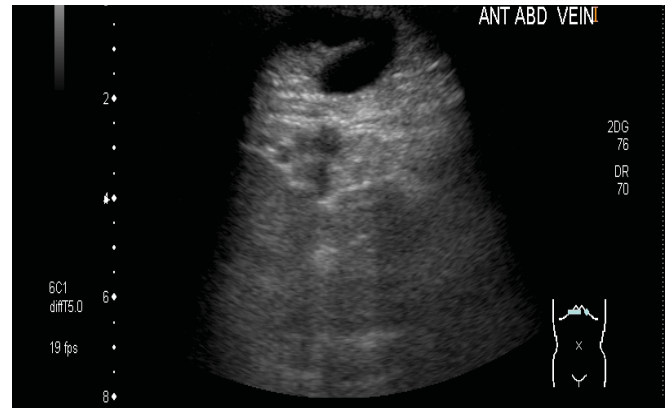


Figure 6: Caput Medusa. Caput medusa are varicosities around the umbilicus formed by obliterated umbilical veins and veins running in the anterior abdominal wall

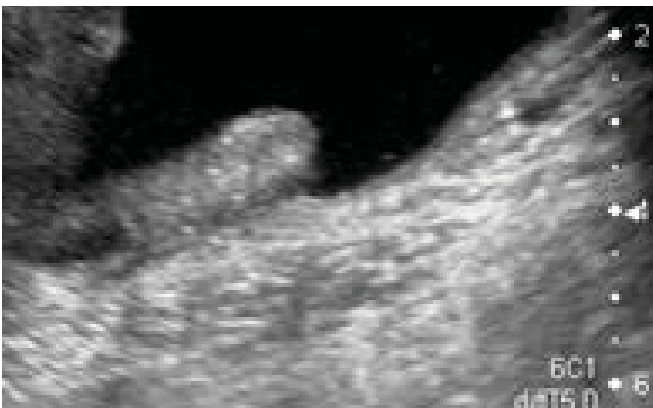


Figure 7: Ascites. Ascites is easy to recognise ultrasonographically. This is non-specific findings but is frequently seen in portal hypertension

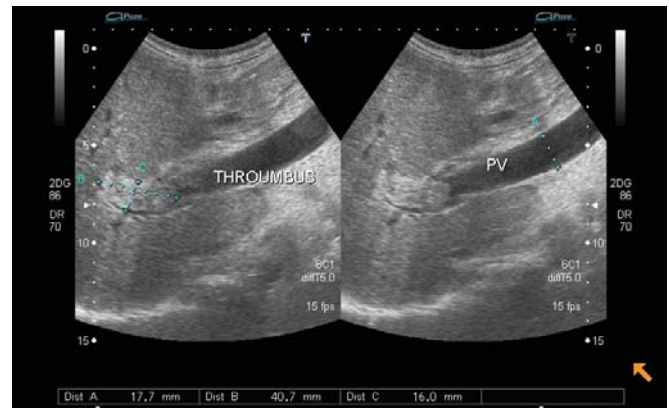


Figure 8: Portal vein thrombosis. The thrombus is easily identifiable. This was the finding in a young cirrhotic patient who had ascites as well.

ultrasonographer, when more details are required. Ultrasonographer or radiologist may do Colour Doppler Ultrasound (CDUS) or duplex Doppler ultrasound (dDUS) for more

detail studies. CDUS will pick up much more detail of portosystemic anastomosis and dDUS will help to determine velocity and pressure inside the portal system.

The training program should have a slot for ultrasound training throughout the clinical rotations, so as to expose the resident and medical students to ultrasound images from the 3rd to final year MBBS training period. This will help them familiarise with the ultrasound images of different normal and abnormal conditions and in the use of ultrasound equipment. During the ultrasound training, they will re-learn physical examination, surface anatomy and the art of communication.

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