

CC02-S2 **Ultrasound Evaluation and Correlation with Other Modalities for GB, Biliary Tree & Pancreas**

16:10-16:30

GBR 101

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Disease of GB & Biliary Tree

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Abdominal ultrasound is the most widely used as a primary screening test for gallbladder and biliary tree disease because it is safe and real-time imaging. In addition, it is highly sensitive to detect GB stones. However, due to the limitation of resolution, there is a limitation in clearly evaluating the gallbladder wall and lesions using conventional ultrasound, and some gallbladder diseases may have nonspecific or similar ultrasound findings, making differential diagnosis difficult.

To perform ultrasound of the gallbladder, patients should fast enough for at least 6 hours to distend gallbladder. Patients are placed in the supine position and the examination begins, and a sub-costal or intercostal scan is performed at the anterior axillary line. If it is difficult to find the gallbladder, the neck of the gallbladder can be traced to find the major interlobar fissure, which is an important milestone, showing a constant positional relationship with the gallbladder. If it is difficult to obtain good sonic window for gallbladder in the supine position, placing the patient on the left lateral decubitus may improve the sonic window of the gallbladder and may cause gallstones hidden in the neck to roll out to the body. The fundus of the gallbladder can also be difficult to observe because it is often obscured by gas from the right colon or gastric antrum. In this case, a deep breath may be helpful for descending gallbladder further below the ribs, making it easier to observe, and if you use harmonic imaging, internal artifacts can be reduced and the wall of the gallbladder can be more clearly visible. In conventional ultrasound, a probe with a low frequency of 2-5 MHz is routinely used to examine the gallbladder wall as a single or two layers, and after a meal or in a contracted state

of the gallbladder for any reason, the gallbladder wall looks a little thicker, with three distinct layers. It can also be distinguished. Recently, many disadvantages of conventional ultrasound have been overcome with advanced ultrasound technologies such as harmonic imaging, compounding imaging, and speckle reduction imaging. With the use of high resolution ultrasound (HRUS) that combines those technologies with high frequency ultrasound, it is possible to more clearly evaluate various gallbladder diseases.

Regarding the bile duct, if only the intrahepatic bile duct is to be examined, there is no need for special fasting, but if the extrahepatic bile duct, especially the lower part, is to be examined, at least 6 hours of fasting is recommended. However, if the lower extrahepatic bile duct is obscured by air in the stomach and duodenum, drinking 500cc to 1L of water just before the examination may be helpful. The distal common bile duct is often obscured by gas in the duodenum and stomach, making it difficult to see. In such cases, by pressing the abdomen with the probe or performing a semierect position examination with the patient sitting up, the sonic window can be improved through the pancreatic head, allowing observation of the distal common bile duct. Like other organs, when examining the bile duct, combining terminal and transverse scanning can reduce false positives and false negatives. Occasionally, when the right hepatic artery passes between the bile duct and the portal vein, the hepatic artery may be mistaken for a bile duct obstruction. In such cases, normal anatomical knowledge and Doppler examination are helpful in differential diagnosis. The use of harmonic ultrasonography reduces the subcapsular artifact and suppresses

the multiple reflection artifact caused by gas in the intestinal tract, thereby improving the contrast between the bile duct and the surrounding organs and assisting in the examination. The bile duct's expansion, wall thickening, presence of foreign bodies, and other abnormalities must be evaluated, and if bile duct expansion is present, the upper common bile duct in the pancreatic head must be evaluated.

In this lecture, we will briefly discuss the ultrasound evaluation of gallbladder and biliary tree, and discuss the imaging findings of various gallbladder and bile duct diseases and their correlation with other imaging modalities.