

Chronic Liver disease, Cirrhosis and Screening for HCC (AB 26.1)

Ultrasound has several advantages over advanced imaging techniques like computer tomography (CT) and magnetic resonance imaging (MRI). Ultrasound requires no ionizing radiation, is readily available, cost effective, easier to schedule many times same day, and the reproducibility of results has made it for the past 20-years the initial modality of choice for imaging hepatobiliary conditions and screening for HCC. Ultrasound also helps to determine next most important appropriate advanced imaging study whether CT, MRI, or MRCP along with contrast levels. Disadvantages: image quality may degrade due to bowel gas, acoustic window acquisition, obesity, and sonographer in-expertise.

As advanced imaging modalities, computer tomography (CT) and magnetic resonance imaging (MRI) offer excellent 3-dimensional resolution. CT scan requires a significant dose of ionizing radiation but the speed of image acquisition reduces the potential for motion artifact. MRI yields better soft contrast resolution than CT and does not expose individuals to ionizing radiation, but due to longer image time is motion artifact-prone and may require sedation.

Direct advanced imaging for HCC screening and liver surveillance may substitute for ultrasound in the following circumstances:

- Obesity (BMI >35)
- Marked parenchymal heterogeneity noted on ultrasound.
- Technical limitations of ultrasound such as inability to obtain satisfactory acoustic window: intestinal gas, chest wall deformity, or advanced liver disease resulting in architectural distortion of liver parenchyma

Although emerging data may support CT and MRI-based liver surveillance, AASLD does not recommend routine use of these modalities in patients at risk for HCC. Asian studies suggest both two-phase CT and hepatobiliary contrast-enhanced MRI have superior sensitivity for early-stage HCC detection compared with US-based surveillance (83% and 86% vs. 28%–29%, respectively). (3.4) Neither CT nor MRI however validate in cohorts of Western patients without chronic viral hepatitis B. Further, CT-based surveillance raises concerns about radiation and contrast exposure, particularly if repeated semiannually. MRI contrast agents raise similar concerns, as well as those regarding radiology service capacity, patient acceptance, and cost-effectiveness.

Relative to surveillance, AASLD acknowledges the suboptimal performance of CT or MRI in accurately diagnosing HCC in lesions <1cm. AASLD recommends observing patients with sub-centimeter liver lesions on ultrasound by repeat short-interval surveillance using ultrasound and AFP in 3-6 months. Imaging by multiphase CT or contrast-enhanced MRI is advised for those with new or enlarging solid liver lesions >1 cm and patients with unequivocally elevated AFP independent of ultrasound results.

Citations:

- (1) AASLD Practice Guidance on prevention, diagnosis, and treatment of hepatocellular carcinoma. Hepatology 2023 Dec, 78(6):1922-1965. Singal, A, et al. (doi: 10.1097/HEP.0000000000000466)

- (2) Randomized controlled trial of screening for hepatocellular carcinoma. J Cancer Res Clin Oncol 2004 Jul;130(7):417-22. Zhang B, Yang B, Tang Z. (doi: 10.1007/s00432-004-0552-0)
- (3) MRI is cost effective for HCC surveillance in high-risk patients with cirrhosis. Hepatology 2019;69:1599-1613. Kim H, An J, Park J, et al.
- (4) Abbreviated MRI for HCC screening: A systematic review and meta-analysis. J Hepatol 2021;75:108-119