pISSN 2287-2728
eISSN 2287-285X

CMH Elsewhere

http://dx.doi.org/10.3350/cmh.2012.18.2.245
Clinical and Molecular Hepatology 2012;18:245-247

Noninvasive diagnosis of hepatocellular carcinoma

Byung Seok Kim

Department of Internal Medicine, Catholic University of Daegu School of Medicine, Daegu, Korea

Keywords: Hepatocellular carcinoma; Noninvasive diagnosis

Accuracy and disagreement of computed tomography and magnetic resonance imaging for the diagnosis of small hepatocellular carcinoma and dysplastic nodules: role of biopsy.

Sersté T, Barrau V, Ozenne V, Vullierme MP, Bedossa P, Farges O, Valla DC, Vilgrain V, Paradis V, Degos F. Hepatology 2012;55:800-806.

Hepatocellular carcinoma (HCC) is the 6th most common cancer in the world and the third most common malignant tumor following stomach and lung cancers in Korea.[1,2] Approximately 90% of HCCs are associated with a known underlying risk factor. The most frequent risk factors include chronic viral hepatitis (hepatitis B virus, hepatitis C virus) and alcohol intake. Cirrhosis is an important risk factor for HCC, and may be caused by chronic viral hepatitis, alcohol, non-alcoholic fatty liver disease and inherited metabolic diseases.

Tests that can be used in HCC surveillance include serological and imaging examinations. The imaging test most widely used for HCC surveillance is ultrasound (US). US has an acceptable diagnostic accuracy when used as a HCC surveillance test (sensitivity, 58-89%; specificity, >90%).[3,4] Alpha-fetoprotein (AFP) is the most widely tested biomarker in HCC. However, analysis of recent studies showed that AFP determination lacks adequate sensitivity and specificity for effective surveillance and for diagnosis of HCC.[5,6]

Accurate diagnosis of small liver nodules is of paramount importance. Diagnosis of HCC is based on noninvasive criteria or pathology. The noninvasive diagnostic criteria are relevant for the management of patients with suspicion of HCC when small nodule is found in liver.[7] In 2001, a panel of experts on HCC reported for the first time noninvasive diagnostic criteria for HCC based on a combination of imaging and laboratory findings.[8] In 2005, the European Association for the Study of the Liver (EASL) panel of experts and the American Association for the Study of Liver Diseases (AASLD) guidelines adopted a new HCC radiological hallmark, i.e. hypervascularization on arterial phase imaging and washout in the portal or delayed phase. In the presence of cirrhosis, noninvasive diagnosis of HCC can be obtained by one dynamic imaging technique in nodules above 2 cm showing the HCC radiological hallmark and two coincidental dynamic imaging techniques with nodules of 1-2 cm in diameter. Dynamic imaging techniques include contrast-enhanced ultrasound (CEUS), computed tomography (CT), and magnetic resonance imaging (MRI).[9]

Recent updated guidelines have proposed that one dynamic imaging technique (contrast-enhanced CT or MRI) showing the HCC radiological hallmark suffices for diagnosing nodules of 1-2 cm in diameter. When the typical vascular patterns are not present, either other contrast-enhanced study or biopsy is recommended. CEUS may offer false positive HCC diagnosis in patients with intrahepatic cholangiocarcinoma.[10] Thus, CEUS has been dropped

Abbreviations:

AFP, alpha-fetoprotein; CEUS, contrast-enhanced ultrasound; CLD, chronic liver disease; CT, computed tomography; DN, dysplastic nodule; HCC, hepatocellular carcinoma; HGDN, high-grade dysplastic nodule; MRI, magnetic resonance imaging; US, ultrasound

Corresponding author : Byung Seok Kim
Department of Internal Medicine, Catholic University of Daegu School of Medicine, 33 Duryugongwon-ro 17gil, Nam-gu, Daegu 705-718, Korea
Tel. +82-53-650-4455, Fax. +82-53-656-3281, E-mail; kbs9225@cu.ac.kr

from the diagnostic imaging techniques because of its inability to adequately differentiate cholangiocarcinoma from HCC. The application of dynamic imaging criteria should be applied only to patients with cirrhosis of any etiology and to patients with chronic hepatitis B.[11]

Sersté et al investigated the diagnostic accuracy of noninvasive techniques in US-detected 1-2 cm nodules in 75 consecutive patients with chronic liver disease (CLD) or cirrhosis.[12] Sensitivity and specificity of the typical vascular pattern of HCC on enhanced multiphase CT and MRI were assessed with biopsy for the diagnosis of dysplastic nodules (DNs) and small HCC. This study revealed that all patients (31 of 31; 100%) who had conclusive coincidental findings (i.e., arterial enhancement and portal/delayed phase washout) on both examinations had HCC or high-grade dysplastic nodule (HGDN) (sensitivity, 57%; specificity, 100%). Interestingly, all patients (51 of 51; 100%) who had conclusive findings on at least one of the two examinations had HCC or HGDN (sensitivity, 96%; specificity, 100%). There was a disagreement regarding imaging findings between CT and MRI in 21 of 74 (28%) patients and no washout on both examinations in 23 of 74 patients (31%). In these 44 patients, liver biopsy provided an accurate diagnosis. This study showed the high specificity and low sensitivity of combined contrast-enhanced CT and MRI for the diagnosis of HCC in patients with CLD or cirrhosis with small (≤2 cm) hepatic nodules. This suggests that the noninvasive diagnosis of HCC or HGDN can be achieved if arterial enhancement and portal/delayed washout are found in one dynamic imaging examination.

In one study including 89 cases of nodules between 0.5 and 2 cm detected within surveillance programs in patients with cirrhosis showed that noninvasive criteria are accurate for the diagnosis of HCC, with specificity of 93-97%.[7] Unfortunately, sensitivity of these noninvasive criteria is 33%, meaning that two-thirds of nodules required pathological confirmation. The other study suggested that the use of a sequential algorithm would maintain an absolute specificity and increase the sensitivity, with significant savings in terms of liver biopsy examinations for 1-2 cm nodules detected during surveillance in cirrhotic patients.[13] Khalili et al have focused on the optimization of imaging diagnosis of small HCC and have shown that the best sequential diagnostic strategy consisted of MRI followed by CT (if MRI was inconclusive).[14]

In conclusion, in patients with cirrhosis or chronic hepatitis B with hepatic nodules, the noninvasive diagnosis of HCC can be achieved if arterial hypervascularity and portal/delayed washout are found in one dynamic imaging technique. When a first imaging modality does not provide a conclusive diagnosis, either a second sequential imaging study or liver biopsy is recommended. Further prospective studies to confirm the accuracy of this approach are needed.

Conflicts of Interest

The authors have no conflicts to disclose.

REFERENCES

1. Parkin DM, Bray F, Ferlay J, Pisani P. Global cancer statistics, 2002. CA Cancer J Clin 2005;55:74-108.
2. Song IH, Kim KS. Current status of liver disease in Korea: hepatocellular carcinoma. Korean J Hepatol 2009;15(Suppl 6):S50-S59.
3. Bolondi L. Screening for hepatocellular carcinoma in cirrhosis. J Hepatol 2003;39:1076-1084.
4. Kim CK, Lim JH, Lee WJ. Detection of hepatocellular carcinomas and dysplastic nodules in cirrhotic liver: accuracy of ultrasonography in transplant patients. J Ultrasound Med 2001;20:99-104.
5. Singal A, Volk ML, Waljee A, Salgia R, Higgins P, Rogers MA, et al. Meta-analysis: surveillance with ultrasound for early-stage hepatocellular carcinoma in patients with cirrhosis. Aliment Pharmacol Ther 2009;30:37-47.
6. Lok AS, Sterling RK, Everhart JE, Wright EC, Hoefs JC, Di Bisceglie AM, et al. Des-gamma-carboxy prothrombin and alpha-fetoprotein as biomarkers for the early detection of hepatocellular carcinoma. Gastroenterology 2010;138:493-502.
7. Forner A, Vilana R, Ayuso C, Bianchi L, Solé M, Ayuso JR, et al. Diagnosis of hepatic nodules 20 mm or smaller in cirrhosis: Prospective validation of the noninvasive diagnostic criteria for hepatocellular carcinoma. Hepatology 2008;47:97-104.
8. Bruix J, Sherman M, Llovet JM, Beaugrand M, Lencioni R, Burroughs AK, et al. Clinical management of hepatocellular carcinoma. Conclusions of the Barcelona-2000 EASL conference. European Association for the Study of the Liver. J Hepatol 2001;35:421-430.
9. Bruix J, Sherman M; Practice Guidelines Committee, American Association for the Study of Liver Diseases. Management of hepatocellular carcinoma. Hepatology 2005;42:1208-1236.
10. Vilana R, Forner A, Bianchi L, García-Criado A, Rimola J, de Lope CR, et al. Intrahepatic peripheral cholangiocarcinoma in cirrhosis patients may display a vascular pattern similar to hepatocellular carcinoma on contrast-enhanced ultrasound. Hepatology 2010;51:2020-2029.
11. Bruix J, Sherman M; American Association for the Study of Liver Diseases. Management of hepatocellular carcinoma: an update. Hepatology 2011;53:1020-1022.
12. Sersté T, Barrau V, Ozenne V, Vullierme MP, Bedossa P, Farges O,

http://dx.doi.org/10.3350/cmh.2012.18.2.245

et al. Accuracy and disagreement of computed tomography and magnetic resonance imaging for the diagnosis of small hepatocellular carcinoma and dysplastic nodules: role of biopsy. Hepatology 2012;55:800-806.
13. Sangiovanni A, Manini MA, Iavarone M, Romeo R, Forzenigo LV, Fraquelli M, et al. The diagnostic and economic impact of contrast imaging techniques in the diagnosis of small hepatocellular carcinoma in cirrhosis. Gut 2010;59:638-644.
14. Khalili K, Kim TK, Jang HJ, Haider MA, Khan L, Guindi M, et al. Optimization of imaging diagnosis of 1-2 cm hepatocellular carcinoma: an analysis of diagnostic performance and resource utilization. J Hepatol 2011;54:723-728.