Abdomen MRI Symposium lll_Solving conundrums of hepatic tumors with updated pathologic knowledge & liver MRI

SY14-1

Latest pathologic updates of primary hepatic tumor

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Primary liver carcinomas with both hepatocytic and cholangiocytic differentiation have been referred to as “combined (or mixed) hepatocellular-cholangiocarcinoma (cHCC-CCA).” The most recent 4th edition of the World Health Organization’s Classification of Tumors of the Digestive System specified a classic form of cHCC-CCA, containing areas of typical HCC and areas of typical CCA, and three variants with stem cell features: “typical”, “intermediate cell” and “cholangiolocellular” subtypes, in which the majority of tumor cells show stem/progenitor-like cells or intermediate features between hepatocyte and cholangiocyte and there are no or only focal areas of typical HCC and/or typical CCA. Interestingly, many of classic form of cHCC-CCAs may demonstrate a component with stem cell features in the interphase of the HCC and CCA components. Recently several work, which dissected each component of cHCC-CCA has shown that “stem cell” phenotypes can be demonstrated in many forms of primary liver carcinoma and three variants with stem cell features are not as clearly separable as once thought. Furthermore, improvements in laboratory techniques to demonstrate hepatocytic, cholangiocytic and stem cell differentiation have resulted in increasingly recognition of a spectrum of primary liver carcinomas with mixed differentiation. These complex morphological and immunohistochemical diversity of these tumors has resulted in various terminology without uniformity, which has impeded systemic study of cHCC-CCA. Thus, an international group of hepatic pathologists, radiologists, surgeons and clinicians previously published in this area have worked to formulate proposed nomenclature for these heterogeneous carcinomas with the goal of creating uniformity of histologic approach for diagnostic and research purposes and facilitating scientific studies. A recent consensus terminology for primary liver carcinoma with both hepatocytic and cholangiocytic differentiation will be presented.

Keywords : Combined hepatocellular-cholangiocarcinoma, Primary hepatic tumor

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SY14-2

Latest MRI updates on combined HCC-CC

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Combined hepatocellular cholangiocarcinoma (cHCC-CC) is a rare primary liver cancer, accounting for 1.1–6.3% of all primary liver cancers, which comprises a mixture of hepatocellular carcinoma (HCC), cholangiocarcinoma (CC), and/or components with hepatic progenitor/stem cell (HPC) features. The prognosis after resection or transplantation in patients with cHCC-CC has been variably reported and it is still controversial whether the patients with cHCC-CC are optimal candidate for transplantation. The current World Health Organization (WHO) classification system categorizes cHCC-CCs into classical types and subtypes with stem cell features, and the latter is further classified as typical, intermediate, and cholangiocellular subtypes. This classification system brings insights regarding the pathogenic role of HPC in the development of cHCC-CC. However, its clinical and prognostic implications are still questionable. A few previous studies reported that imaging findings of cHCC-CCs are in between those of HCCs and CCs, suggesting a challenge in imaging differentiation of cHCC-CCs from other primary liver cancers. However, recent studies reported that imaging characteristics of cHCC-CCs are associated with their prognosis; cHCC-CCs with HCC-like imaging features may have a favorable prognosis than those with CC-like imaging features. This lecture will summarize current pathologic classification, imaging findings, and prognostic implication of imaging classification of cHCC-CCs.

Keywords : Liver, Combined hepatocellularcholangiocarcinoma, Gadoxetic acid

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SY14-3

Noninvasive diagnosis of cholangiocarcinoma: recent dilemma in MRI

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Intrahepatic mass-forming cholangiocarcinoma (IMCC) is the second most common liver tumor originating from the epithelial lining of the intrahepatic bile duct with increasing incidence in Western countries [1]. IMCC typically appears as non-capsulated wavy or lobulated tumors that reveal initial rim enhancement, followed by progressive and concentric filling with contrast material [2]. Previous studies have shown that differentiation of IMCC from HCC could be made without great difficulty based on its typical imaging features on CT or MRI using extracellular contrast media (ECCM) [3]. Since gadoxetic acid-enhanced MRI (EOB-MRI) has been increasingly used for liver MRI, identification of more reliable features other than ECCM-enhanced CT or MRI that enables to distinguish IMCC from other lesions is warranted [4-6]. In case of large HCCs, the presence of capsule, septum, or T2 hyperintense foci are helpful ancillary features to diagnose HCCs with atypical enhancement patterns (e.g., rim enhancement or hypoenhancement) [7-9]. In case of combined HCC-CC, combined interpretation of imaging features and tumor markers such as CA19-9 and AFP is needed [10, 11]. When small hypervascular mass with/without washout shows target sign on DWI, IMCC should be considered instead of HCC. Although the features of scirrhous HCC on EOB-MRI are similar to those of IMCC, 20% or more arterial enhancement on the peripheral portion of tumor is a helpful feature in distinguishing scirrhous HCC from IMCC [12].

Keywords : Cholangiocarcinoma, MRI, Gadoxetic acid

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Beware of pitfalls in the diagnosis of HCC in EOB MRI

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Gadoxetic acid-enhanced magnetic resonance image (MRI) is widely used in the diagnosis and follow-up for hepatocellular carcinoma (HCC). On gadoxetic acid-enhanced MRI, HCC typically shows arterial enhancement and washout. With this typical imaging appearance, HCC can be diagnosed without histopathological confirmation. Due to absence of normal hepatocyte or decreased expression of organic anionic transporting polypeptide (OATP), HCC usually shows low signal intensity on hepatobiliary phase. In contrast, surrounding normal hepatic parenchyma shows strong enhancement.

However, background liver parenchyma can show abnormal signal intensity on hepatobiliary phase due to various causes (e.g., biliary obstruction, iron deposition, steatosis, fibrosis). Evaluation of signal intensity of background liver parenchyma is important, because it can conceal the presence of HCC on hepatobiliary phase.

Although HCC usually shows hypointensity on hepatobiliary phase, approximately 10 % of HCC show hyperintensity because of OATP overexpression. In addition, various benign tumors and non-tumorous conditions which compromise delivery and uptake of Gd-EOB-DTPA to the hepatocytes show hypointensity on hepatobiliary phase. Recognition of patterns and causes of defect on hepatobiliary phase would help to avoid false-positive diagnosis as HCC. This lecture will discuss various tumorous or non-tumorous conditions which can mimic HCC and highlight the clues for differential diagnosis.

Keywords : Liver, MRI, HCC, Gd-EOB-DTPA