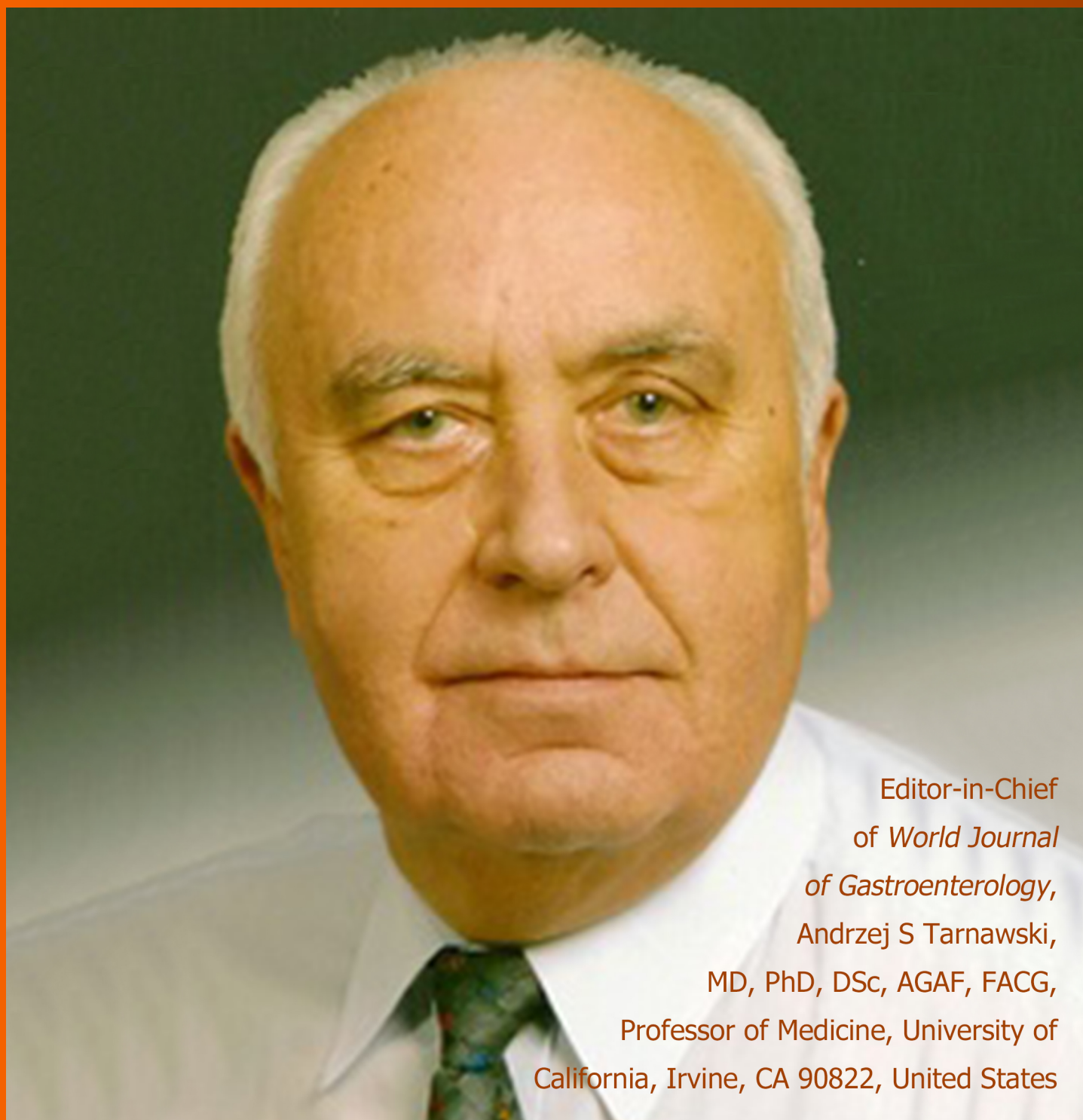


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## Effect of magnetic resonance imaging in liver metastases

Xing-Liang Huang, Xiao-Dong Wang, Zhao-Miao Gong, Yan-Feng Zheng, Jing-Xin Mao

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### Abstract

This letter to the editor is a commentary on a study titled "Liver metastases: The role of magnetic resonance imaging." Exploring a noninvasive imaging evaluation system for the biological behavior of hepatocellular carcinoma (HCC) is the key to achieving precise diagnosis and treatment and improving prognosis. This review summarizes the role of magnetic resonance imaging in the detection and evaluation of liver metastases, describes its main imaging features, and focuses on the added value of the latest imaging tools (such as T1 weighted in phase imaging, T1 weighted out of phase imaging; diffusion-weighted imaging, T2 weighted imaging). In this study, I investigated the necessity and benefits of gadolinium ethoxybenzyl diethylenetriamine pentaacetic acid for HCC diagnostic testing and prognostic evaluation.

**Key Words:** Liver metastases; Magnetic resonance imaging; Liver-specific contrast agents; Gadolinium-ethoxybenzyl-diethylenetriamine pentaacetic acid; Hepatocellular carcinoma; Hepatobiliary contrast agents

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**Core Tip:** Hepatocellular carcinoma (HCC) is a highly aggressive tumor that often goes undetected until it reaches an advanced stage. It is the most prevalent primary malignant tumor of the liver/hepar which ranking as the third leading cause of cancer (tumor)-related deaths worldwide. Magnetic resonance imaging (MRI) is considered as the prominent imaging method for diagnosing and monitoring HCC. In recent years, with the development and application of magnetic resonance functional and metabolic imaging technology as well as liver-specific contrast agents, MRI not only aids in the early detection and diagnosis of HCC but also reflects the pathogenesis, biological behavior characteristics, and abnormal gene expression at the cellular level of HCC, providing important information for prognosis evaluation, treatment plan selection, and efficacy evaluation of HCC.

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## TO THE EDITOR

We read with interest the review article by Maino *et al*[1], which summarized different kinds of imaging features on liver/hepar metastases, with special attention paid to typical and atypical utilize of magnetic resonance imaging (MRI) findings. Focal liver lesions are liver-occupying lesions with corresponding pathological changes, including tumor and non-tumor lesions such as liver abscesses, parasites, and cysts in clinical work[2]. Depending on the type of focal benign and malignant liver lesion, different clinical treatment methods and follow-up strategies are required; therefore, an accurate diagnosis of the lesion is crucial[3]. It was reported that hepatocellular carcinoma (HCC) is the sixth common cancer with poor prognosis therefore causing death as third in the world. Furthermore, early evaluation and prediction of tumor efficacy are crucial for improving patient survival[4]. Although traditional non-enhancement techniques can help depict local liver lesions, comparing enhancement sequences has greater merit when evaluating their behavior compared with healthy liver tissue. MRI is a standard reference radiological and an advanced medical technique for detecting liver metastasis, which has unique advantages in the detection of liver/hepar metastases. Compared to other traditional imaging methods such as fluoro-2-deoxyglucose positron emission tomography and computed tomography, MRI exhibits the higher sensitivity and specificity. It means that MRI may more accurately and efficient to detect small metastases in the liver/hepar, which providing more precise diagnostic information in clinical diagnosis[5].

Currently, liver MRI is gradually becoming the gold standard for liver metastasis detection and the evaluation of treatment response. The authors of this article have greatly improved the accuracy of liver metastasis detection by developing different MRI protocols. Gadolinium-ethoxybenzyl-diethylenetriamine pentaacetic acid (Gd-EOB-DTPA) is a liver/hepar and gallbladder contrast agent (hepatobiliary contrast agent). Intravenous injection usually may increase the antithesis of the MRI on the liver/hepar parenchyma significantly, thereby improving the lesion detection rate[6]. The author believes that the effectiveness of Gd-EOB-DTPA has been widely proven in the international literature and should be used whenever liver MRI examination is required for patients with known primary tumors. The author believes that the effectiveness of Gd-EOB-DTPA could be comprehensive proven in varies international references and can be utilized whenever liver/hepar MRI examination is required for patients with known primary tumors.

I strongly agree with this viewpoint, and with my understanding of related fields, I hope to improve the effectiveness of MRI as a prognostic tool for patients with liver disease. Firstly, the sensitivity and specificity of Gd-EOB-DTPA enhanced MRI in diagnosing HCC (diameter  $\leq 5$  cm) can reach 92% and 95%, respectively[7]. Second, gadolinium disulfide is metabolized through both the liver and kidney pathways; therefore, patients with renal insufficiency can significantly improve their safety during MRI examination through a biliary metabolic shunt[8]. In addition, the enhanced properties of gadolinium disulfide are related to the expression level of organic anion transport peptides in HCC lesions, such as liver cell nuclear factor 3  $\beta$ . The expression is related to the different degrees of differentiation of HCC, and an increase in its expression can downregulate the expression of organic anion transport peptide 1B3 in HCC. Compared with the surrounding normal liver tissue, liver cancer cells have certain functional characteristics. Therefore, the gadolinium disulfide-enhanced MRI characteristics of HCC can reflect the functional status of liver cancer cells[9].

Ethoxybenzyl MRI has become an important tool in the clinical management of HCC. In addition to improving the accuracy of HCC diagnosis, it can also provide relevant information such as molecular typing, early postoperative recurrence, and immunotherapy, providing an important reference for the selection of standardized treatment plans and prognostic judgment of HCC.

## FOOTNOTES

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