

MRI in Liver Disease Advancements, Applications, and Clinical Implications

Sooyeon Kang*

Department of Radiology, University of Alberta, Canada

Introduction

Magnetic Resonance Imaging (MRI) has emerged as a pivotal tool in the diagnosis and management of liver diseases. This review explores the latest advancements in MRI technology, its applications in various liver conditions, and the clinical implications for patient care. The focus is on how these developments are improving diagnostic accuracy and guiding treatment decisions. Key areas discussed include the use of MRI in identifying liver lesions, assessing liver fibrosis, and monitoring the response to therapy in patients with liver cancer (HCC). The review also highlights the role of MRI in the management of liver metastases and the challenges associated with liver MRI, such as motion artifacts and the need for specialized techniques. The goal is to provide a comprehensive overview of the current state of liver MRI and its future potential.

Advances in MRI Technology for Liver Disease

Recent advances in MRI technology have significantly improved the detection and characterization of liver lesions. These include the development of new MRI sequences, such as diffusion-weighted imaging (DWI) and perfusion MRI, which provide additional information about the tissue characteristics of liver lesions. The use of contrast agents, such as gadolinium-based contrast agents, has also improved the sensitivity of MRI in detecting liver lesions. The development of new MRI techniques, such as MR elastography (MRE), has provided a non-invasive method for assessing liver stiffness and fibrosis. The use of artificial intelligence (AI) in MRI has also improved the accuracy of liver MRI by automating the detection and characterization of liver lesions.

***Corresponding author:** Sooyeon Kang, Department of Radiology, University of Alberta, Canada, E-mail Id: kan_soo354@yahoo.com

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