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Abdomen 1

SY21-2

Clinical Applications of MR Elastography in Chronic Liver Disease

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Magnetic resonance elastography (MRE) has become the most reliable noninvasive imaging technique for assessing liver fibrosis and is now an integral component of multiparametric liver MRI. Beyond fibrosis staging, MRE provides valuable quantitative biomarkers for risk stratification, prognostic assessment, and treatment planning in patients with chronic liver disease.

This lecture will provide a practical overview of the clinical applications of liver MRE for radiologists. The first part will briefly review the principles of MRE, image acquisition, quality assessment, and common pitfalls affecting liver stiffness measurements. The diagnostic performance of MRE for staging liver fibrosis across various etiologies, including metabolic dysfunction-associated steatotic liver disease, viral hepatitis, and alcohol-related liver disease, will be discussed, together with its advantages over ultrasound-based elastography.

The lecture will then focus on the expanding role of MRE beyond fibrosis evaluation. Recent evidence supporting the use of liver stiffness as an imaging biomarker for predicting clinically significant portal hypertension, hepatic decompensation, and outcomes after treatment for hepatocellular carcinoma will be reviewed. The complementary role of spleen stiffness and emerging quantitative MRI techniques will also be briefly introduced.

Finally, future directions, including three-dimensional MRE and artificial intelligence-based quantitative imaging, will be highlighted. Through practical examples and current evidence, this lecture aims to help radiologists integrate MRE into routine clinical practice and understand its evolving role in the diagnosis, prognostic assessment, and management of chronic liver disease.

Keywords: *Magnetic resonance elastography, Chronic liver disease, Liver fibrosis*