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MR imaging in liver fibrosis

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Liver fibrosis represents a common process in chronic liver diseases. Liver fibrosis staging has both prognostic and therapeutic implications. For instance, it has been shown in patients with non-alcoholic fatty liver disease that fibrosis stage was associated with long-term overall mortality, liver transplantation, and liver-related events, independently of other features of steatohepatitis.

Histopathological analysis of liver biopsies remains the reference examination for assessing disease severity within clinical trials and clinical practice. Liver biopsy-based assessments, however, remain imprecise and are not without cost or risk. A need therefore arises for reliable and highly accurate surrogate end-points that can be used for assessment of disease severity and response to treatment.

Ultrasound elastography is becoming the standard first-line examination for diagnosing severe liver fibrosis. It also brings information for staging portal hypertension in compensated cirrhosis and for grading liver steatosis. MR elastography has several technical advantages relative to ultrasound elastography, translating into increased feasibility, reproducibility and accuracy for assessing fibrosis and cirrhosis severity.

Moreover, MR imaging offers a multiparametric approach to assess the degree of liver fibrosis / inflammation, steatosis, iron overload, portal hypertension and hepatobiliary transport function. For this comprehensive assessment, several MR methods including MR elastography, chemical shift encoded MR imaging with susceptibility mapping, T1 / $T2^*$ relaxometry, and hepatobiliary contrast-enhanced MR imaging may be used.

Multiparametric quantitative MR imaging complements the information brought with quantitative ultrasonography and has the potential to become a reference method in patients with chronic liver disease and liver fibrosis.

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