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Abdomen 1

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Quantitative MRI Biomarkers of the Liver

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Quantitative MRI (qMRI) of the liver allows characterization of tissue and organ properties with the aim of disease detection and characterization, as well as assessment of therapy response. Liver qMRI techniques have recently seen a rapid increase in technical maturity, commercial availability, clinical acceptance, and regulated reimbursement. The most prominent biomarkers are targeted at diffuse liver disease and include parametric mapping of Proton Density Fat Fraction, Liver Iron Concentration via T2 or T2* relaxometry, Liver Stiffness assessed by MR Elastography, and T1 relaxometry. Many more are being explored, not only in the domain of parametric mapping but also based, for example, on volumetry as well as body and tissue composition analysis, down to microstructure. Advancements are also being made in the correction of confounding effects as well as with multi-parametric acquisition and analysis.

Key properties of any quantitative biomarker are accuracy and precision; a particular challenge can be the reproducibility across field strengths, system types, and platforms. The wider qMRI techniques are disseminated, the more important their standardization, quality assurance, and establishing of clinical value, for example in terms of sensitivity and specificity, become. These features are not only influenced by the equipment and application implementation but also by details of the qMRI deployment, by the analysis and interpretation of the results, as well as by the transfer and communication of those results, where the human operator can be a key factor. While new developments also aim at user assistance, for example by employing artificial intelligence, knowledge about the technical basis remains important for many qMRI techniques.

This talk will give an overview of established and emerging quantitative MRI biomarkers of the liver and discuss their successful application.

Keywords: *Quantitative imaging, Abdominal MRI, Diffuse liver disease*