AB064. P-35. Quantitative magnetic resonance cholangiopancreatography applications in primary sclerosing cholangitis and cholangiocarcinoma

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Background: Magnetic resonance cholangiopancreatography (MRCP) allows the non-invasive visualisation of the biliary tree, gallbladder and pancreatic ducts, but it is conventionally assessed subjectively. MRCP+ is a new software service developed by Perspectum Diagnostics Ltd., with FDA 510(k) Clearance, which builds a quantitative model of the pancreatobiliary system from a 3D MRCP acquisition. MRCP+ provides a number of measurements, including gross biliary tree volume and gallbladder volume, as well as the cross-sectional diameter of the ducts at every point in the tree, allowing more precise and objective characterisation of biliary irregularities such as strictures and dilatations. Initial work is focusing on the utility of MRCP+ derived metrics in primary sclerosing cholangitis (PSC), which is a risk factor for the development of cholangiocarcinoma (CCA). We are actively seeking feedback and potential collaborations to investigate applications in CCA.

Methods: 3D MRCP acquisitions are processed by trained in-house operators, using novel proprietary algorithms. Steps involve the enhancement of ducts, automatic or user-guided segmentation of the gallbladder, expert identification of biliary and non-biliary (e.g., gastrointestinal) high signal components, parametric modelling of the centrelines and diameters of all ducts, and automatic identification of regions of duct diameter variation.

Results: Pilot studies in PSC show that biliary tree volume and several other derived metrics can statistically significantly distinguish PSC from other liver diseases such as autoimmune hepatitis. An initial investigation has begun applying MRCP+ to cases with suspected and/or confirmed CCA.

Conclusions: MRCP+ shows promise in the stratification of biliary diseases. Future work will further refine the methods and quantitative metrics to provide novel imaging biomarkers. We will explore potential applications, including screening patients with PSC to detect the initial signs of the development of CCA.

Keywords: Magnetic resonance cholangiopancreatography (MRCP); quantitative magnetic resonance imaging (quantitative MRI); biliary tree visualization; biliary strictures; case study; cholangiocarcinoma (CCA)

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