MRCP+ has a role in enhancing detection of high-grade strictures in primary sclerosing cholangitis

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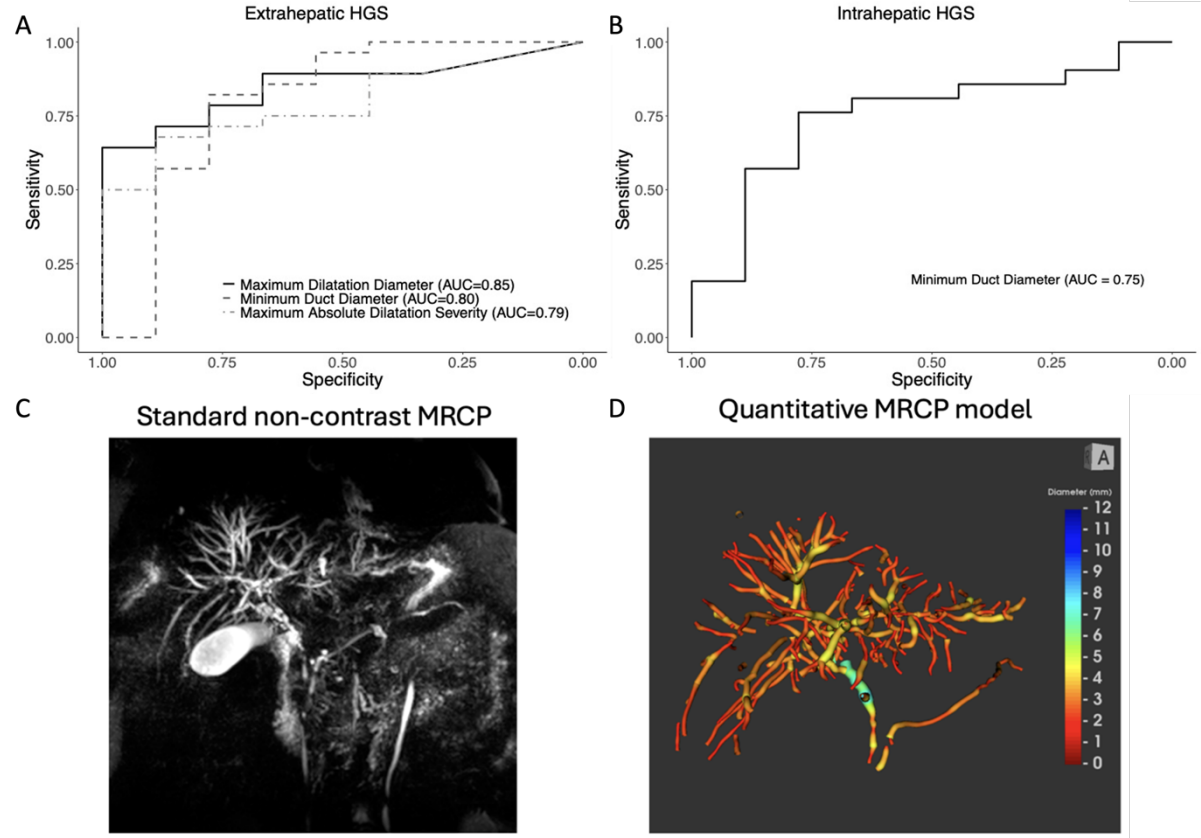
Background: Identifying high-grade strictures (HGS), strictures requiring endoscopic intervention, in patients with primary sclerosing cholangitis (PSC) relies upon subjective assessments of magnetic resonance cholangiopancreatography (MRCP). Quantitative MRCP (MRCP+) provides objective evaluation of MRCP examinations and has shown utility to support disease stratification, monitoring progression, and predicting clinical outcomes. We evaluated the impact that MRCP+ has on clinicians' confidence in diagnosing HGS in patients with PSC.

Methods: Three expert abdominal radiologists independently assessed 28 patients with PSC, each scanned twice, 1 year apart. Each radiologist assessed each case three times in a randomized order. Assessments 1 and 2 using standard radiological assessment, and the third time using MRCP+. Each round of assessments occurred after a three week delay to avoid any memory of individual cases. The presence of HGS was recorded on a semi-quantitative confidence scale. The proportion of cases where readers definitively agreed on presence/absence of HGS were used to assess inter- and intra-reader agreement and confidence, respectively. Diagnostic accuracy of MRCP+ metrics to detection extrahepatic and intrahepatic HGS was investigated using area under the receiver operating characteristic curve (AUC).

Results: Standard radiological assessment of MRCP scans had high within reader agreement for identifying HGS in the intra- and extrahepatic ducts (70% and 75% respectively), while between reader agreement was significantly lower for intrahepatic ducts (42.9%) than extrahepatic ducts (67.1%) ($p<0.01$). When using MRCP+, agreement for intrahepatic HGS detection improved (67.9%), comparable to extrahepatic ducts, a significant improvement compared with baseline reads ($p=0.02$). MRCP+ metrics had good performance for the detection of extrahepatic (AUC >0.79) and intrahepatic (AUC = 0.75) HGS (Figure).

Conclusion: MRCP evaluation supported by quantitative metrics tended to increase individual reader confidence and reduce inter-reader variability for detecting HGS. This could help standardization of MRCP assessments in clinical practice thereby supporting enhanced patient management.

Figure: Diagnostic performance of advanced MRCP+ metrics to differentiate between patients with and without A) extra-hepatic HGS and B) intra-hepatic HGS, according to radiologists' interpretation of MRCP reads. C) Traditional MRCP and D) MRCP+ images from a patient with PSC with extrahepatic high-grade stricture.


A
Extrahepatic HGS
Sensitivity
Specificity
1.00
0.75
0.50
0.25
0.00
Maximum Dilatation Diameter (AUC=0.85)
Minimum Duct Diameter (AUC=0.80)
Maximum Absolute Dilatation Severity (AUC=0.79)
B
Intrahepatic HGS
Minimum Duct Diameter (AUC = 0.75)
C
Standard non-contrast MRCP
D
Quantitative MRCP model
Diameter (mm)
12
11
10
9
8
7
6
5
4
3
2
1
0