

## Quantitative MRCP metrics have utility in assessing changes in biliary tree health in PSC patients: a ten-year evaluation

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**Background:** Progression of large duct disease is a hallmark of the natural history of PSC. Lack of objective biomarkers hampers clinical surveillance of cholangiopathy and development of surrogate endpoints for clinical trials. Clinical guidelines have noted that quantitative MRCP (MRCP+) may have utility in objectively monitoring PSC. Here, we perform a natural history study examining the change in quantitative biliary metrics over time using quantitative MRCP (MRCP+) in adults followed over a 10-year period.

**Methods:** Patients with PSC undergoing non-contrast 3D MRCP as part of standard-of-care were enrolled retrospectively from a single centre. All patients had at least two follow-up MRCP scans (in addition to a baseline scan) over the 10-year follow-up period. Linear (LMM) and generalised (GLMM) linear mixed effects models were used to assess the temporal variation in MRCP+ metrics. Random slopes and intercepts were used for each, with years since the baseline scan as the predictor, controlling for repeated measures and participant variation.

**Results:** Retrospective MRCP images were evaluated from 134 adult patients (54% male) recruited from a single center. Results are indicative of a significant average percentage increase per annum in the number of ducts (4.2%,  $\beta=1.04$ ,  $p<0.001$ ), number of strictures (5.1%,  $\beta=1.05$ ,  $p<0.001$ ), number of dilatations (6.7%,  $\beta=1.05$ ,  $p<0.001$ ), and number of ducts with a stricture or dilatation (5.4%,  $\beta=1.05$ ,  $p<0.001$ ) from baseline. There was also a 5.0% ( $p<0.001$ ) increase in both the length of strictures and dilatations over the follow-up period from baseline, respectively.

**Conclusion:** Quantitative MRCP metrics have utility to assess changes in the biliary tree resulting from disease progression over time.

Figure: Change in MRCP+ metrics in adults with PSC followed over a 10-year period.

