

## **COST-EFFECTIVE ANALYSIS OF PRELIMINARY SINGLE-OPERATOR CHOLANGIOSCOPY IN MANAGEMENT OF DIFFICULT STONES**

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**Background:** Single-operator peroral cholangioscopy (POC) is a therapeutic modality for difficult biliary stone disease. Given its high success rate and increasing availability, analysis of the economic impact of early POC utilization is critical for clinical decision-making.

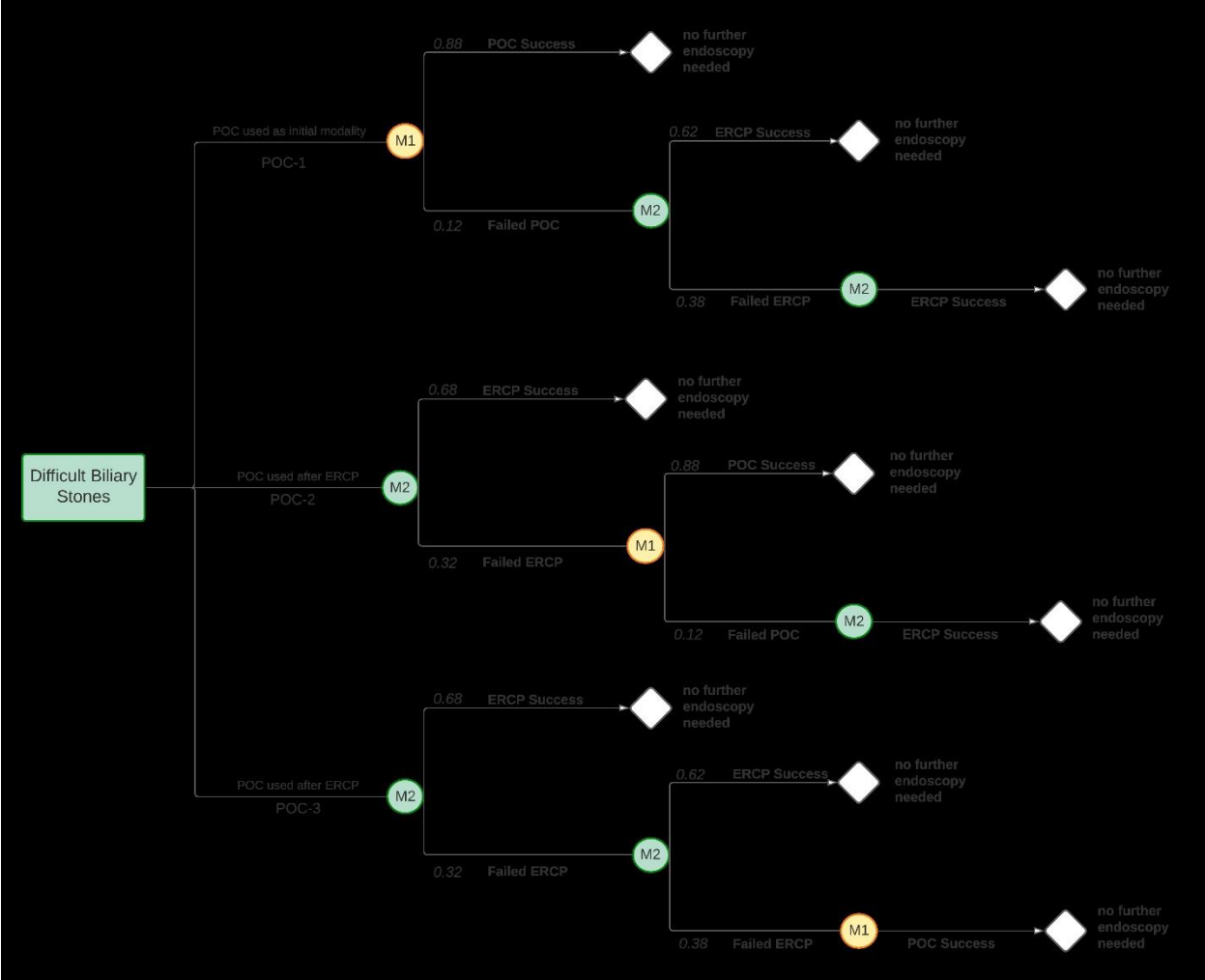
**Aims:** We aim to compare the cost-effectiveness of different first and second-line endoscopic modalities for difficult-to-treat choledocholithiasis.

**Methods:** A decision tree model with a 1-year time horizon and a hypothetical cohort of 200 patients was used to analyze the cost-effectiveness of POC for first, second and third-line intervention in presumed difficult biliary stones. We adopted the perspective of a Canadian tertiary hospital, omitting complications and recurrence rates associated with ERCP.

Effectiveness estimates were obtained from updated meta-analyses. One-way sensitivity analyses and probabilistic sensitivity analyses were also performed to assess how changes in key parameters affected model conclusions.

**Results:** First and second-line POC achieved comparable clinical efficacy from 95.5% to 96.5% stone clearance. The least expensive strategy is third-line POC (POC-3: \$769,151). Performing POC during the second ERCP was marginally more expensive (POC-2: \$770,832) but 9% more effective. The strategy of first-line POC incurred the highest hospital expenditures (POC-1: \$848,141) but decreased total procedures performed by 13.4% when compared with POC-2. Sensitivity analysis was robust in showing POC-2 as the most optimal approach.

**Conclusions:** Second-line POC was superior to first and third-line POC for treatment of difficult biliary stones. When based on meta-analysis of non-heterogeneous trials, POC-2 is more cost-effective and cost-efficient. Our study warrants a larger pragmatic effectiveness trial.



**FIGURE 1:** Management model for treating difficult biliary stones  
 POC, peroral cholangioscopy; ERCP, endoscopic retrograde cholangioscopy. M1 indicates a decision to use ERCP. M2 indicates a decision to use POC. POC-1 – POC used as initial step. POC-2 – POC delayed until after ERCP failure. POC-3 – POC delayed until two failed ERCP attempts.

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