

Optimizing the prioritization of cholangioscopy-guided electrohydraulic lithotripsy: the role of stone characteristics and cost-efficacy

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I read with interest Kogias *et al*'s article regarding predictors for cholangioscopy-guided electrohydraulic lithotripsy (EHL) in managing difficult common bile duct stones (DBS) [1]. The authors are to be commended for developing a pragmatic classification tree that prioritizes EHL based on specific anatomical markers—namely, the presence of DBS, small papillae, and the absence of wedged stones. Given the expanding role of single-operator cholangioscopy (SOC), such structured approaches are invaluable for reducing futile attempts with conventional techniques.

However, I offer a complementary perspective regarding the preprocedural assessment. While the authors' model focuses on papillary anatomy and stone impaction, other stone characteristics remain critical variables. Garg *et al* showed that large stone diameter and impaction degree are well-established predictors of mechanical lithotripsy failure [2]. In cases where stones occupy the majority of the ductal lumen, or exhibit significant surface irregularities, conventional mechanical crushing often fails, potentially leading to ductal injury or "basket impaction." Integrating these morphological stone properties into the algorithm could further enhance its sensitivity, identifying patients who require first-line EHL to ensure definitive clearance in a single session.

Furthermore, economic implications warrant consideration. High-quality evidence, including systematic reviews and randomized trials, supports early-line EHL's superior stone clearance rates compared to conventional methods [3,4]. Although the single-use cholangioscope system involves significant upfront instrument costs, cost-utility analyses by Deprez *et al* suggest that early SOC can be cost-effective by reducing the number of repeat endoscopic retrograde cholangiopancreatography procedures [5]. It would be illuminating to know whether the authors observed reductions in total adverse events or length of hospital stay that specifically offset the higher costs of the EHL equipment in their cohort.

Validating this algorithm in a multicenter setting, incorporating broader stone characteristics and detailed cost-benefit analysis, would further solidify EHL's position in the therapeutic strategy for difficult biliary stones.

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Authors' reply

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We would like to thank Koji Takahashi for the thoughtful and constructive comments [1] on our recently published study evaluating predictors for cholangioscopy-guided electrohydraulic lithotripsy (CG-EHL) in the management of difficult bile duct stones (DBS) [2].

First, we agree that stone size and impaction are established predictors of conventional technique failure, as demonstrated by Garg *et al* [3]. In our study [2], DBS were defined as stones >1.5 cm and/or impacted, consistent with validated criteria. Beyond confirming their relevance, our analysis identified DBS as statistically significant predictors of CG-EHL prioritization across all models. These findings support the view that stone size and impaction are central determinants in decision-making for EHL.

Second, the structure of our classification tree reflects this hierarchy. The initial split prioritizes DBS over other anatomical factors, such as papillary size or stone wedging (Fig. 1,2 in our study [2]), thereby supporting simplified clinical decision-making. Ridge regression further confirmed the predominant influence of DBS compared with lower-level predictors. Collectively, these findings reinforce the central role of DBS in guiding CG-EHL selection (Fig. 3).

Third, regarding cost considerations, our study does not advocate indiscriminate first-line use of EHL, but rather supports its earlier positioning in the therapeutic algorithm for appropriately selected patients. Conventional techniques should remain the initial approach given their established efficacy and lower immediate costs. However, when predictors suggest a high likelihood of failure with standard methods, early EHL may reduce repeat endoscopic retrograde cholangiopancreatography procedures, prolonged hospitalization, and cumulative adverse events.

Finally, no statistically significant differences were observed in adverse events or length of hospital stay. We agree that multicenter validation and formal cost-effectiveness analyses would further substantiate this approach and look forward to future studies addressing these important considerations.

Impact of *Helicobacter pylori* eradication on the progression of Correa's cascade

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Kouvaras *et al* [1] demonstrated an association between *Helicobacter pylori* infection (*Hp*-I) and the development of gastric intestinal metaplasia (IM)—complete, incomplete or mixed forms—a premalignant lesion in the Correa cascade of gastric carcinogenesis. Beyond *Hp*, oral *Porphyromonas gingivalis* (*Pg*) can translocate to the stomach further promoting progression along the Correa cascade [2,3].

Focusing on IM and gastric cancer (GC) associated with *Hp* and/or *Pg*, several significant findings are noteworthy:

Hp can also inhabit the oral cavity, which may serve as a main extragastric reservoir. Similarly, the oral cavity serves as a primary reservoir for *Pg* [2]. *Pg* and its virulence factors, including gingipains, appear to contribute to the aforementioned sequence of gastric carcinogenesis [4].

Among the types of IM, the incomplete type is more