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## Optimal Predictive Criteria for Common Bile Duct Stones: The Search Continues

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See “Evaluating the Revised American Society for Gastrointestinal Endoscopy Guidelines for Common Bile Duct Stone Diagnosis” by Jake S. Jacob, Michelle E. Lee, Erin Y. Chew, et al., on page 269-274.

Of all patients with symptomatic gallbladder stones, 10–20% are diagnosed with concomitant common bile duct (CBD) stones. Suspected CBD stones should be removed via endoscopic retrograde cholangiopancreatography (ERCP). However, ERCP has a significant risk (6–15%) of major adverse events, including post-ERCP pancreatitis, bleeding, cholangitis, and perforation.<sup>1</sup> Therefore, it is important to select appropriate candidates for ERCP in order to avoid unnecessary ERCP.

The American Society for Gastrointestinal Endoscopy (ASGE) guidelines of 2010 recommended stratification of the CBD stone risk, determined by baseline biochemical tests and abdominal ultrasonography (US), when considering ERCP.<sup>2</sup> The guidelines defined high risk (>50%) as meeting one of the following four criteria: CBD stones evident on abdominal US, bilirubin (Bb) level >4 mg/dL, Bb level 1.8–4.0 mg/dL and a dilated CBD apparent on abdominal US, or evidence of clinical cholangitis. The guidelines recommend that high-risk patients proceed directly to ERCP. However, several validation studies have shown that 20–30% of cases undergo diagnostic

ERCP only (no stones).<sup>3–5</sup>

In 2019, the ASGE updated their guidelines with the goal of improving pretesting to reduce the number of diagnostic ERCP.<sup>6</sup> The high-risk CBD stone criteria were simplified to one of the following: 1) CBD stones evident on US or cross-sectional imaging, 2) total Bb level >4 mg/dL and a dilated CBD, or 3) ascending cholangitis.

In this issue of *Clinical Endoscopy*, Jacob et al.<sup>7</sup> compared the diagnostic accuracies of the original 2010 and revised 2019 guidelines and assessed the performance of each set of criteria. In a retrospective analysis of 267 patients, the 2019 high-risk criteria improved the specificity from 55% (2010 guidelines) to 80% and the positive predictive value from 79% to 83%. The diagnostic ERCP rate decreased from 21% to 17.4%, which is consistent with the goal of minimizing diagnostic ERCP.

In a recent paper, the performance of endoscopic ultrasound (EUS) and magnetic resonance cholangiopancreatography (MRCP) in diagnosing CBD stones was comparable with that of ERCP, but EUS and MRCP are associated with much lower risks of adverse events relative to those with ERCP.<sup>8</sup> Therefore, the guidelines have been revised to reduce the proportion of high-risk CBD stone patients and increase that of intermediate-risk patients who are recommended to undergo further evaluation employing EUS, MRCP, laparoscopic intraoperative cholangiography, or laparoscopic intraoperative US.

The European Society of Gastrointestinal Endoscopy (ESGE) guidelines for endoscopic management of CBD stones uses a simple criterion to define a high risk of CBD stones—features suggestive of cholangitis or CBD stones identified using US.<sup>9</sup> The ESGE guidelines do not include the Bb level

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or presence of a dilated CBD on US. In a recent study, Jagtap et al.<sup>10</sup> compared the clinical utility of the revised ASGE and ESGE guidelines in terms of risk stratification. The specificity and positive predictive value were 96.87% and 89.57%, respectively, using the ASGE high-risk criteria versus 98.96% and 96.24%, respectively, using the ESGE high-risk criteria. Among 17 patients with a Bb level >4 mg/dL and a dilated CBD evident on US (ASGE criteria), only one had CBD stones. In addition, the ASGE guidelines identified 58 (8.6%) additional patients as being at intermediate risk because they were aged >55 years; none had CBD stones. Thus, removing age >55 years from the ASGE intermediate-risk criteria would reduce the requirement for further diagnostic procedures (such as EUS or MRCP) in 8.6% of patients.

As diagnostic imaging methods with good performance for CBD stones emerge, the criteria for high-risk CBD stones should include only those cases where the CBD stone is objectively identified using imaging tests. However, the diagnostic performance of each modality, such as EUS and MRCP, can differ according to the stone size and type. In addition, we should consider local availability and operator expertise for EUS and MRCP. Therefore, CBD stone risk stratification remains controversial, and a more accurate algorithm using clinical features is still needed. The cost-effectiveness of such algorithms must also be evaluated.

**Conflicts of Interest**

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