When Does Assessment for Bile Duct Stones Need to Be Performed Prior to Cholecystectomy for Calculus Gallbladder Disease?

Dennis Yang* and Patrick Yachimski‡

*Division of Gastroenterology, Hepatology and Nutrition, University of Florida College of Medicine, Gainesville, Florida; ‡Division of Gastroenterology, Hepatology and Nutrition, Vanderbilt University Medical Center, Nashville, Tennessee

This article is part of a series on enhancing the value of care in Gastroenterology and Hepatology. Each article in this series examines specific clinical scenarios in which the value of care can be improved over a range of sub-specialties in the field.

David A. Katzka, MD
Guest Special Section Editor

The purpose of this article is to enhance the value of care in determining when assessment for bile duct stones should be performed before cholecystectomy. Symptomatic gallstone disease accounts for more than 1.3 million urgent medical visits and an estimated 750,000 cholecystectomies per year in the United States.1,2 Up to 20% of patients with gallstones may present with choledocholithiasis.3,4

Current practice guidelines endorsed by gastroenterological and surgical societies recommend stratifying patients to high-likelihood, intermediate-likelihood, or low-likelihood categories for choledocholithiasis based on factors including presenting symptoms, laboratory parameters, and findings on transabdominal ultrasound. In practice, preoperative endoscopic retrograde cholangiopancreatography (ERCP) is appropriate for patients with a high pretest probability (>50%) of choledocholithiasis, whereas patients at low risk (<10%) may proceed directly to cholecystectomy.5

Despite its rather common occurrence, ongoing debate exists over the appropriate initial evaluation and management of select patients with suspected choledocholithiasis, particularly those deemed at intermediate likelihood. Reasonable options for the management of patients at intermediate likelihood for choledocholithiasis could include further preoperative testing, surgical management (intraoperative cholangiogram [IOC] followed, if positive, by laparoscopic common bile duct exploration or intraoperative ERCP), or postoperative management (IOC followed, if positive, by postoperative ERCP). Costs of testing/invasive procedures, potential for adverse events associated with invasive testing, and hospital length of stay each may vary according to respective management strategy and impact the value of care.

Options for preoperative biliary imaging consist of magnetic resonance cholangiopancreatography (MRCP) and endoscopic ultrasound (EUS), which have a similar diagnostic performance for the detection of choledocholithiasis, with sensitivities and specificities ranging between 93% and 95% and 96% and 97%, respectively.6 Initial MRCP or EUS to triage patients for ERCP appears to be cost effective when compared with direct ERCP.7,8 Although a recent study from the United Kingdom indicated that preoperative imaging with MRCP might be more cost effective than EUS,9 the choice of test must be weighed carefully and may be determined by patient-specific factors. MRCP is noninvasive and may be favored in patients who are at above average risk for procedural sedation. Patient cooperation is crucial during MRCP to limit motion artifact and ensure high-quality images, and MRCP is contraindicated in patients with some metallic implants. On the other hand, endoscopic assessment with EUS allows, if choledocholithiasis is detected, the opportunity to proceed directly to ERCP during the same sedation session. Ultimately, the choice between MRCP vs EUS will be influenced by patient characteristics, as well as local availability and expertise. The clinical utility and cost effectiveness of either imaging modality is dependent on their selective use. Preoperative biliary imaging should be reserved for patients with an intermediate risk for choledocholithiasis and avoided in those with a low or high pretest probability.

Direct cholecystectomy with IOC is an alternative option in patients at intermediate risk. Choledochocholithiasis detected by IOC can be managed by either surgical common duct exploration or postoperative ERCP with comparable rates of morbidity and mortality.10 In a randomized clinical trial involving 100

Abbreviations used in this paper: ERCP, endoscopic retrograde cholangiopancreatography; EUS, endoscopic ultrasound; IOC, intraoperative cholangiogram; MRCP, magnetic resonance cholangiopancreatography.
patients with an intermediate risk for a common bile duct stone, Iranmanesh et al.\textsuperscript{10} showed that initial cholecystectomy with IOC resulted in a shorter hospital stay and fewer total procedures. A subsequent prospective validation study by the same investigators reached similar conclusions.\textsuperscript{11} However, use of IOC may be decreasing, which may be attributable at least in part to the increasing use of preoperative biliary imaging and ERCP.\textsuperscript{12–14}

In summary, implementation of high-value care in the management of suspected choledocholithiasis requires accurate stratification into high-, intermediate-, and low-probability categories. Patients with low or high probability of choledocholithiasis should be triaged to either cholecystectomy or preoperative ERCP, respectively. Local resources and technical expertise in endoscopic and surgical management should dictate the optimal management strategy in patients with an intermediate risk for choledocholithiasis. Initial cholecystectomy with IOC is a reasonable approach in centers with expertise and may result in reduced hospital stay and fewer procedures. Preoperative ERCP in this group should be reserved for cases in which choledocholithiasis is confirmed by MRCP or EUS. Institutional adoption of a standardized practice algorithm may minimize redundant investigations and shorten length of stay.\textsuperscript{15,16} Successful implementation of a high-value care strategy should help achieve the goals of eliminating unnecessary testing and avoiding adverse events associated with unnecessary invasive procedures.

References


Reprint requests

Address requests for reprints to: Patrick Yachimski, MD, MPH, Division of Gastroenterology, Hepatology and Nutrition, Vanderbilt University Medical Center, 1630 The Vanderbilt Clinic, Nashville, Tennessee 37232-5280. e-mail: patrick.yachimski@vanderbilt.edu; fax: (615) 343–7174.

Conflicts of interest

The authors disclose no conflicts.