Systematic review of endoscopic ultrasonography versus endoscopic retrograde cholangiopancreatography for suspected choledocholithiasis

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CRD summary
This review compared endoscopic ultrasonography (EUS) guided endoscopic retrograde cholangiopancreatography (ERCP) with ERCP in patients with suspected choledocholithiasis. The authors concluded that EUS-guided ERCP reduced the risk of complications and acute pancreatitis. Despite several problems with the review, the authors’ conclusion appears reasonable given the data presented, but caution is warranted when interpreting the practice recommendation.

Authors’ objectives
To compare the use of endoscopic ultrasonography (EUS) guided endoscopic retrograde cholangiopancreatography (ERCP) with ERCP alone for the evaluation of patients with suspected choledocholithiasis.

Searching
MEDLINE, Cochrane Central Register of Controlled Trials (CENTRAL) and Science Citation Index were searched from 1 January 1989 to 1 January 2009. Search terms were reported. Reference lists of retrieved articles were checked for relevant trials. No language restrictions were imposed.

Study selection
Randomised controlled trials (RCTs) of EUS-guided ERCP versus ERCP alone in patients with suspected choledocholithiasis were eligible for inclusion. Median age of participants in the included trials ranged from 58 to 70 years. Most participants were female. The prevalence of common bile duct stones ranged from 23% to 43%.

The authors stated neither how the study selection was performed nor how many reviewers performed the task.

Assessment of study quality
Study quality was assessed using the Cochrane Collaboration criteria, which rated method of randomisation, concealment of allocation, blinding, loss to follow-up and selective outcome reporting. The number of drop-outs was assessed.

The authors did not state how many reviewers performed the quality assessment.

Data extraction
Relative risks (RR) and 95% confidence intervals (CI) were calculated for additional endoscopic procedures, complications and acute pancreatitis. The authors did not state how many reviewers performed the data extraction, but stated that disagreements were resolved through consensus. Given that only two authors undertook this review, it was likely that both contributed to data extraction in some way.

Methods of synthesis
For each outcome pooled relative risks (RRs) and 95% CIs were calculated using a random-effects meta-analysis. Heterogeneity was assessed using $I^2$ and $X^2$ statistics.

Results of the review
Four RCTs (n=426) were included in the review. In terms of study quality, all of the trials employed sealed-envelope allocation concealment. No trial was double blinded. Two trials did not report on the method of randomisation.

Complications (four trials, n=426 participants): EUS-guided ERCP had a significantly lower risk of complications than ERCP alone (RR 0.35, 95% CI 0.20 to 0.62). There was no evidence of statistical heterogeneity.
Acute pancreatitis (three trials, n=283 participants): EUS-guided ERCP had a significantly lower risk of acute pancreatitis than ERCP alone (RR 0.21, 95% CI 0.06 to 0.83). There was no evidence of statistical heterogeneity.

Additional endoscopic procedures (four trials, n=426 participants): EUS-guided ERCP had a significantly higher risk of repeat endoscopy than ERCP alone (RR 2.46, 95% CI 1.34 to 4.52). Heterogeneity was moderate ($I^2=60\%$).

Cost information
Cost information from various sources was narratively discussed as part of the authors' discussion. The information suggested that EUS-guided ERCP was likely to be cost-effective when the probability of common bile duct stones was intermediate.

Authors' conclusions
Compared with ERCP alone strategy, EUS-guided ERCP significantly reduced the risk of overall complications and post-ERCP acute pancreatitis. By performing EUS first, ERCP may be safely avoided in two-thirds of patients.

CRD commentary
Inclusion criteria for the review were broadly defined and no outcome measures were specified. Several relevant sources were searched for published studies; however, the restriction to published literature may mean that relevant unpublished trials were missed. Publication bias was not assessed. It was unclear how many reviewers performed study selection and validity assessment, which may have introduced error and bias into the review. Validity assessment was undertaken using the Cochrane Criteria (a standard tool). Trials were combined using meta-analysis and study heterogeneity was explored, which was appropriate. The authors' practice recommendation that EUS-guided ERCP should be used in patients with an intermediate risk of choledocholithiasis relied heavily on information from cost-effectiveness studies, rather than their results, and may not be reliable. The authors did not fully discuss their finding that more endoscopic procedures were needed with EUS-guided ERCP, which would likely affect costs and benefits. Further, the authors made reference to diagnostic performance in their conclusions, which was not part of their review. Overall, there were several methodological weaknesses within the review, but the authors’ conclusions that EUS-guided ERCP significantly reduced the risk of overall complications and post-ERCP acute pancreatitis appear reasonable given the evidence presented. Other conclusions and practice recommendations went beyond the review evidence and may not be reliable.

Implications of the review for practice and research
Practice: The authors stated that EUS-guided ERCP should be used in patients with an intermediate risk of choledocholithiasis.

Research: The authors stated that for future RCTs, ERCP alone should only be considered in patients with a high probability of choledocholithiasis.

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