

# Endoscopic Ultrasound Guided Choledochoduodenostomy Versus Endoscopic Retrograde Cholangiopancreatography as First Line Drainage of Malignant Distal Biliary Obstruction: A Meta-analysis of Randomized Controlled Trials

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## INTRODUCTION

Endoscopic retrograde cholangiopancreatography (ERCP) with stent placement is the intervention of choice for palliation in cases of malignant distal biliary obstruction (MDBO). Recently, endoscopic ultrasound-guided choledochoduodenostomy (EUS-CDS) has emerged as an alternative.

## AIM

This meta-analysis aims to synthesize available evidence to compare EUS-CDS and ERCP as first-line management in MDBO.

## METHOD

Online databases, including Embase, Medline, Web of Science, Scopus, Cochrane Library, PubMed, and Google Scholar, were searched from inception through June 2024. Randomized clinical trials (RCTs) comparing EUS-CDS and ERCP-guided biliary drainage in human subjects were included. The outcomes of interest were pooled technical success, clinical success, and adverse events between the two groups. Pooled proportions were calculated with 95% confidence intervals (CIs) using a random-effects model. Heterogeneity was assessed using the I<sup>2</sup> statistic.

## RESULTS

A total of 5 RCTs met eligibility criteria (2 from South Korea, 2 international, and 1 from the US), encompassing 256 patients in the ERCP group (42% female, mean age 69 years) and 231 patients in the EUS-CDS group (46% female, mean age 70 years) with MDBO and follow-up ranging from 6 to 12 months or until death. The pooled relative risks (RR) for technical and clinical success rates in EUS-CDS vs. ERCP across included studies were 1.05 (95% CI: 0.95–1.17; I<sup>2</sup> = 63%) and 1.03 (95% CI: 0.98–1.10; I<sup>2</sup> = 0%), respectively, with no significant differences between the groups. While the pooled RR for overall adverse events was nonsignificant, the pooled RR for acute pancreatitis was 0.20 (95% CI: 0.05–0.79; I<sup>2</sup> = 0%). Procedure duration was comparable, with no significant difference between the two groups. Results are summarized in Table 1.

## CONCLUSIONS

This meta-analysis demonstrated no significant differences in technical and clinical success rates between EUS-CDS and ERCP-guided biliary drainage in patients with MDBO. While the overall adverse event rate was similar between groups, patients who underwent EUS-CDS had an 80% reduction in the risk of post-procedural pancreatitis. Based on these findings, either EUS-CDS or ERCP may be selected as a first-line intervention for biliary drainage in MDBO, with EUS-CDS considered over ERCP to reduce pancreatitis risk. The choice, however, should be based on individual patient characteristics and the availability of expertise.

Study outcome	Number of studies	SDM	RR (95% CI)	I <sup>2</sup>	P-value
Technical success	5	NA	1.05 (0.95 - 1.17)	63%	>0.05
Clinical success	5	NA	1.03 (0.98 - 1.1)	0%	>0.05
Stent patency	4	0.049 (-0.34 - 0.43)	NA	68%	>0.05
Stent dysfunction	5	NA	0.67 (0.42 - 1.1)	0%	>0.05
Procedure time	5	-0.5 (-1.04 - 0.05)	NA	87%	>0.05
Adverse events					
•Severe			1.1 (0 - 39438)		
•Fatal	5	NA	0.63 (0.19 - 2.15)	0%	>0.05
•Overall			0.93 (0.59 - 1.47)		
Pancreatitis	5	NA	0.2 (0.05 - 0.79)	0%	0.02
Cholangitis	4	NA	1.22 (0.51 - 2.93)	0%	>0.05
Survival time	4	NA	0.08 (-0.33 - 0.5)	73%	>0.05

Table 1: Outcomes of EUS-CDS vs ERCP in management of MDBO. SDM-Standardized mean difference; RR- Relative risk; CI-Confidence interval; NA- Not applicable.

