Cost-benefit analysis of different management pathways for patients with suspected choledocholithiasis

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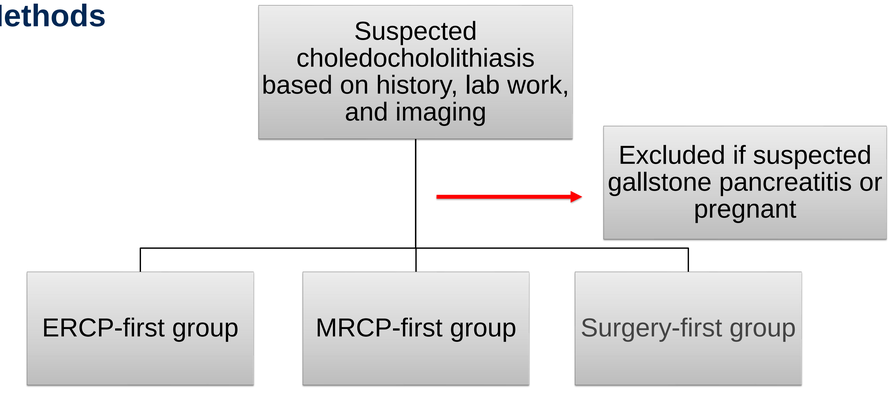
Introduction

Choledocholithaisis is estimated to be present in 1-15% of patients with cholelithiasis.[1] Endoscopic retrograde cholangiopancreatography (ERCP) is often used as a primary diagnostic modality due to its additional therapeautic effects. However, feared complications of ERCP include perforation, bleeding, and post-ERCP pancreatitis.[2]

Objective:
What is the safest, most efficient, and most cost-effective method of managing suspected choledocholithiasis?

Hypothesis:
Patients who underwent ERCP first had decreased length of stay and therefore decreased total hospital costs relative to those who did not undergo ERCP first.

Methods



Primary outcomes measured: Length of stay
Secondary outcomes measured: Median aggregated hospital costs, incidence of complications

Results

Patient Demographics

Variable	Overall Patients (N=132)	ERCP-first (N=60)	MRCP-first (N=33)	Surgery-first (N=39)
Age (years)	50.1 ± 20.1	53.2 ± 21.5	44.5 ± 17.6	50.1 ± 19.3
Gender (Male)	48 (36.4%)	17 (28.3%)	10 (30.3%)	21 (53.8%)
Race				
White	110 (83.3%)	51 (85.0%)	25 (75.8%)	34 (87.2%)
Black	8 (6.1%)	5 (8.3%)	2 (6.1%)	1 (2.6%)
Asian	1 (<1%)	0 (0%)	1 (3.0%)	0 (0%)
Not Reported/Unknown	6 (4.5%)	1 (1.7%)	3 (9.1%)	2 (5.1%)
Other	7 (5.3%)	3 5.0%)	2 (6.1%)	2 (5.1%)
Body Mass Index	31.6 ± 7.1	31.1 ± 7.0	30.8 ± 5.6	33.0 ± 8.1
Charlson Comorbidity Index	1.6 ± 1.7	1.8 ± 1.7	1.1 ± 1.4	1.7 ± 1.8
Probability of Choledocholithiasis Based on ASGE Guidelines				
High	17 (12.9%)	0 (0%)	3 (9.1%)	14 (35.9%)
Medium	62 (47.0%)	26 (43.3%)	21 (63.6%)	15 (38.5%)
Low	53 (40.2%)	34 (56.7%)	9 (27.3%)	10 (25.6%)

Primary and Secondary Outcomes

Variable	ERCP-first (N=60)	MRCP-first (N=33)	Surgery-first (N=39)	P-value
Length of Stay (Days)	3.7 ± 2.6	3.2 ± 1.6	2.8 ± 3.1	0.21
Post-procedural Complication	5 (8.3%)	1 (1.7%)	0 (0%)	-
Post-ERCP Pancreatitis	2 (3.3%)	0 (0%)	0 (0%)	-
Hospital Costs (U.S. Dollars)	335,909 (453,594)	221,061 (294,958)	179,014 (187,502)	0.079

Length of Stay by Admitting Service

Variable	Medicine Primary (N=63)	Surgery Primary (N=69)	P-value
Length of Stay (Days)	3.8	2.7	0.01

Conclusions

Admitting service may decrease length of stay

- Admission to a surgical versus non-surgical service may help patients discharge from the hospital earlier.

Surgical intervention as an initial management pathway

- A surgery-first approach for suspected choledocholithiasis may result in shorter hospital stays and lower median hospital costs compared to ERCP-first or MRCP-first approaches.

Cost-effectiveness of diagnostic modalities

- Despite ERCP being considered the gold standard, our study highlights the potential cost savings associated with surgery-first approaches, particularly with regard to total hospital costs.

Safety considerations

- Post-ERCP pancreatitis occurred in 3.3% of patients who underwent ERCP-first, which falls within the range reported in the literature.

References

1. McNicoll CF, Pastorino A, Farooq U, et al. Choledocholithiasis. [Updated 2023 Jul 10]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK441961/

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