

# The Roll of Preoperative Magnetic Resonance Cholangiopancreatography/Endoscopic Retrograde Cholangiopancreatography in the Setting of Mildly Elevated Liver Enzymes Prior to Cholecystectomy

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## Background

- The role of cholangiopancreatography prior to cholecystectomy is a subject of debate as elevated liver enzymes (LFTs) may or may not be a result of active choledocholithiasis. The aim of this study is to evaluate the roll of obtaining MRCP/ERCP prior to proceeding with cholecystectomy in patients presenting with mildly elevated LFTs, as defined as total bilirubin of 2-4 mg/dL (<5x the upper limit of normal).

## Objective

Identify the role of elevated obtaining a MRCP/ERCP prior to preceding with a cholecystectomy in patients with elevated LFTs

## Methods

The HCA Healthcare southeast division database was retrospectively queried for patients ages 18-80 undergoing inpatient cholecystectomy with abnormally elevated total bilirubin during years 2014-2021. Patients with a bilirubin > 4mg/dL at any point during admission were excluded. Patient encounters were then queried for performance of MRCP/ERCP. Presence of choledocholithiasis was confirmed via analysis of ERCP reports for presence of choledocholithiasis and stone extraction. A multivariate logistic regression was used with additive and interaction models.

## Results

Predictor	Odds Ratio (presence of choledocholithiasis)	95% Confidence Interval on Odds Ratio	p
<b>Additive Model</b>			
ERCP	3.226	[2.527, 4.118]	<0.0001
MRCP	1.614	[1.293, 2.009]	<0.0001
Bilirubin 2-4 mg/dL	1.221	[0.977, 1.518]	0.076
<b>Interaction Model</b>			
ERCP	1.627	[1.301, 2.029]	<0.0001
MRCP	3.059	[2.243, 4.164]	<0.0001
Bilirubin 2-4 mg/dL	1.154	[0.911, 1.514]	0.204

## Discussion

- A total of 4,432 patient encounters were included. In the additive model, both ERCP and MRCP were predictive of presence of choledocholithiasis with Odds Ratios (OR) of 3.23 and 1.66 (p<0.0001), respectively. Mildly elevated total bilirubin was not found to increase odds of choledocholithiasis presence in either the additive model OR 1.2 (p=0.76) or the interaction model OR 1.18 (p=0.2) (Table1).

## Conclusion

- Mildly elevated bilirubin levels are not a sufficient indication for stone presence when accounting for confirmatory tests like MRCP/ERCP. Routine cholangiopancreatography prior to planned cholecystectomy is not indicated in patients presenting with mildly elevated bilirubin levels.

## References

- Tse, F., Barkun, J. S., & Barkun, A. N. (2004). The elective evaluation of patients with suspected choledocholithiasis undergoing laparoscopic cholecystectomy. *Gastrointestinal endoscopy*, 60(3), 437-448.
- Chisholm, P. R., Patel, A. H., Law, R. J., Schulman, A. R., Bedi, A. O., Kwon, R. S., ... & Prabhu, A. (2019). Preoperative predictors of choledocholithiasis in patients presenting with acute calculous cholecystitis. *Gastrointestinal endoscopy*, 89(5), 977-983.
- Qiu, Y., Yang, Z., Li, Z., Zhang, W., & Xue, D. (2015). Is preoperative MRCP necessary for patients with gallstones? An analysis of the factors related to missed diagnosis of choledocholithiasis by preoperative ultrasound. *BMC gastroenterology*, 15(1), 1-8.
- Richard, F., Boustany, M., & Britt, L. D. (2013). Accuracy of magnetic resonance cholangiopancreatography for diagnosing stones in the common bile duct in patients with abnormal intraoperative cholangiograms. *The American Journal of Surgery*, 205(4), 371-373.
- Al-Jiffry, B. O., Elfateh, A., Chundrigar, T., Othman, B., AlMalki, O., Rayza, F., ... & Hatem, M. (2013). Non-invasive assessment of choledocholithiasis in patients with gallstones and abnormal liver function. *World Journal of Gastroenterology: WJG*, 19(35), 5877.
- Chen, J. E., Kadribegic, A., & Sarkany, D. (2019). Bilirubin correlation may preclude MRCP in acute cholecystitis patients with normal common bile duct diameter. *AJR Am J Roentgenol*, 212(5), 1-6.
- Sirinek, K. R., & Schwesinger, W. H. (2015). Has intraoperative cholangiography during laparoscopic cholecystectomy become obsolete in the era of preoperative endoscopic retrograde and magnetic resonance cholangiopancreatography?. *Journal of the American College of Surgeons*, 220(4), 522-528.

