

Analysis of Transient Hyperbilirubinemia Following Laparoscopic Cholecystectomy



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INTRODUCTION

- Since the introduction of the laparoscopic cholecystectomy in 1987, knowledge about the difficulties associated with the procedure and awareness of the potential complications have grown. Modernization of technical skills to overcome the difficulties and early detection of the complications and their timely management are keys to the success of this procedure. Although open cholecystectomy has largely been replaced by the laparoscopic technique, the potential for iatrogenic duct injuries is higher in the latter procedure.¹ The frequency and type of biliary injuries during laparoscopic cholecystectomy vary, and timely diagnosis and management is critical for the well-being of the patient.²
- Among other techniques for the assessment of biliary injuries, biochemical testing of liver enzymes is a common clinical practice. The sensitivity of LFTs in detecting obstructions in bile flow has been found to be greater than 90%.³ Any increase in their values is always a matter of concern for the clinician and warrants further investigation to determine the underlying pathology. AST and ALT are generally considered a measure of hepatocellular function. ALP levels are increased during obstruction of the biliary duct system; bilirubin levels can increase due to hemolysis or obstruction of the flow of bile. Very high levels of serum transaminases can also be suggestive of common bile duct (CBD) stones.⁴
- With recent advances in minimal access surgery, laparoscopic cholecystectomy is entering an era where it is considered an outpatient procedure. Elevated LFTs are common soon after surgery. The elevation is usually transient, and the LFTs return to normal levels without any intervention.⁵⁻⁷ Preoperative liver function tests were evaluated as one of the possible predictive factors for the conversion of a laparoscopic procedure to open cholecystectomy; it was found that impaired LFTs were not associated with an increased risk of conversion.^{8,9} The aim of this study was to determine whether routine analysis of liver function is mandatory before and after laparoscopic cholecystectomy.
- During routine testing for patients following a laparoscopic cholecystectomy, hyperbilirubinemia and elevated liver enzymes often cause concern, and therefore, may result in an extensive workup. Hyperbilirubinemia is indicative of the obstruction of bile due to gallstones or injury to the bile ducts. In recent practice it has been noted that many patients following a laparoscopic cholecystectomy will have a transient increase in their bilirubin levels, but remain asymptomatic. The question is whether these patients should undergo further workup when the suspicion is low.

OBJECTIVES

- To identify the incidence, cause, and clinical significance of elevated liver enzymes after laparoscopic cholecystectomy
- To determine difference in laboratory tests and other predisposing factors between injured and uninjured CBD
- Patients with an injury to a bile duct or an obstructive process in the biliary tree will usually present with poor clinical signs, hence our goal of this study is to identify the predictive factors versus clinically insignificant transient elevated transaminases

METHODS

- We retrospectively studied patients who underwent laparoscopic cholecystectomy at Stamford Hospital during an inpatient admission for acute cholecystitis from Nov 18' to present.
- We analyzed the post-operative serum levels of total bilirubin, alanine transaminase (ALT), aspartate transaminase (AST), and alkaline phosphatase (ALP) in these patients.
- Groups that had common bile duct injury vs. total population of laparoscopic cholecystectomy were analyzed
- Exclusion criteria:
 - Laparoscopic converted to open
 - ERCP prior to cholecystectomy
 - Preoperative antibiotics were given to all patients
 - Diagnosis of Choledocholithiasis as confirmed by MRCP imaging
- CO 2 pressure during the cases were set to 15 mm Hg

All Cholecystectomies from November 18' - February 20' at Stamford Hospital
Total of 259 Patients

Laparoscopic cholecystectomy with post operative CMP
133 Patients

Excluded open cholecystectomies,
choledocholithiasis, No post operative CMP
126 Patients

RESULTS

Average	Uninjured group (n=129) (95% CI)	CBD injury (n=4) (95% CI)	p-Value ($\alpha=.05$)
Total Bilirubin	1.06±.23	4.0 ±7.95	.001
AST	95.2± 28.8	203.25±212.7	.099
ALT	130.8± 30.0	235.75± 361.9	.118
Alk Phos	114.0± 15.5	240± 261.4	.004
Total OR time	1:44± 0:08	2:48± 0:53	.006

Figure 1. Results of average LFTs and OR time for Injured vs. Uninjured CBD during Laparoscopic Cholecystectomy. Confidence interval was calculated with alpha=.05, All p-values were obtained using a student's t-test, one-sided, two sample with equal variances.

Of the study population 3% of total of 133 patients had CBD Injury confirmed intraoperatively or by MRCP or HIDA post operatively. Total of 60-65% of patient's had elevated AST or ALT.

CONCLUSION

- Total Bilirubin, Alkaline Phosphatase, and Total OR time were all statistically significant different between injured and uninjured groups
- Majority of patients had clinically insignificant elevated Liver Function tests, these results when combined with clinical exam findings should lead to further investigation
- Future studies will focus on risk factors associated with CBD injury and developing a model for predicting CBD injury

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