Spare the Needle, Discharge the Child – Trending Post-Op Labs After Laparoscopic Common Bile Duct Exploration (LCBDE) in Pediatric Patients is Not Helpful

Jacob Niebler, BS[1], Allison Perko, BS[1], Aravindh Ganapathy, MD[2], Gabriel Cambronero, MD[2], Gloria Sanin, MD[2], Maggie Bosley, MD[2], Jess Rauh, MD[2], Mitchell Ladd, MD[3], Thomas Pranikoff, MD[3], Leah Sieren, MD[3], John Petty, MD[3], Kristen Zeller, MD[3], Lucas Neff, MD[3]

[1]Wake Forest School of Medicine, Winston-Salem, NC
[2]Department of General Surgery, Atrium Health Wake Forest Baptist, Winston-Salem, NC
[3]Department of Pediatric Surgery, Atrium Health Wake Forest Baptist, Winston-Salem, NC

INTRODUCTION

Post-operative liver function tests (POST-LFTs) are collected to assess the success of invasive interventions targeted at clearing biliary tree obstructions. Laparoscopic common bile duct exploration (LCBDE) completed at the time of laparoscopic cholecystectomy (LC) is quickly emerging as a valuable alternative to traditional methods of managing choledocholithiasis, as it limits the number of anesthetic events required for treating patients with choledocholithiasis and decreases the length of stay (LOS) for these patients with similar outcomes to traditional methods of managing choledocholithiasis.[1,2] Yet, despite the value of laparoscopic cholecystectomy with LCBDE (LC+LCBDE) in decreasing hospital LOS, uptrending POST-LFTs often lead to additional testing and longer stays despite clinical improvement.

To date, the influence of ductal manipulation during LCBDE on POST-LFT trends remains unclear. Therefore, the utility of POST-LFTs is worth investigating because additional phlebotomy increases length of stay (LOS) and patient distress, which is particularly relevant in treating pediatric patients. Our aim was to describe the changes from pre-op LFTs (PRE-LFTs) to POST-LFTs in pediatric patients undergoing successful LC+LCBDE to determine whether a predictable POST-LFTs trend emerged. We hypothesized that POST-LFTs would not consistently downtrend.

A secondary aim was to assess differences in post-op LOS between pediatric patients who received POST-LFTs and pediatric patients who did not receive POST-LFTs. We hypothesized that patients who did not receive POST-LFTs would have a significantly shorter post-op LOS than patients who did receive POST-LFTs.

METHODS

A retrospective analysis of all pediatric patients (under 18 years old at time of surgery) undergoing LC+LCBDE at Atrium Health Wake Forest Baptist from November 2018 to July 2022 was conducted. Successful LC+LCBDE was defined as common duct clearance on fluoroscopy without the need for subsequent ERCP. Prior to LFTs analysis, all unsuccessful LC+LCBDE cases, as well as all cases without PRE-LFTs or POST-LFTs were removed analysis (Figure 1). POST-LFTs were classified as increased or decreased from PRE values with Wilcoxon signed-rank testing to assess for differences between PRE and POST-LFTs.

Post-op LOS between successful LC+LCBDE with and without POST-LFTs was also compared. Prior to LOS analysis, all unsuccessful LC+LCBDE cases, all cases without PRE-LFTs, and all cases where the patient was discharged and readmitted prior to surgery were removed from analysis. Cases were then grouped based on whether they had POST-LFTs completed (Figure 1). A two-sample t-test was completed to compare average post-op LOS between both groups.

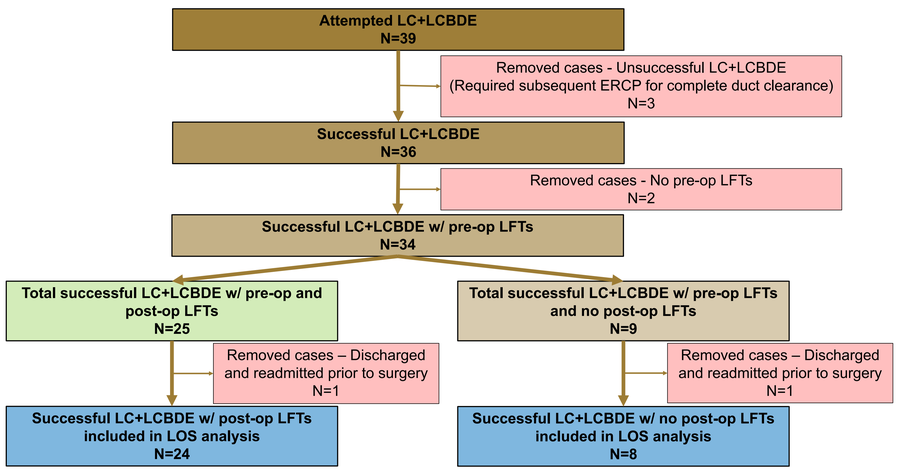

Figure 1. Selection of pediatric LC+LCBDE cases for LFT trends and LOS analysis. Sample used in LFT trends analysis is shown in green, and samples used in LOS analysis is shown in blue.

RESULTS

Thirty-nine patients underwent LC+LCBDE over 4 years, with 36 successful LC+LCBDE cases and 25 cases with complete records for LFT trends analysis (PRE-LFTs and POST-LFTs). In patients who underwent successful LC+LCBDE, there was no significant difference between PRE and POST-LFTs values for total bilirubin, AST, ALT, or Alk Phos (Figure 2). Increases in POST-LFTs from PRE-LFT values for T. Bili, AST, ALT, and Alk Phos were also observed in 32%, 44%, 40%, and 32% of cases respectively. Figure 3 demonstrates percent changes from PRE-LFTs to POST-LFTs among successful LC+LCBDE cases.

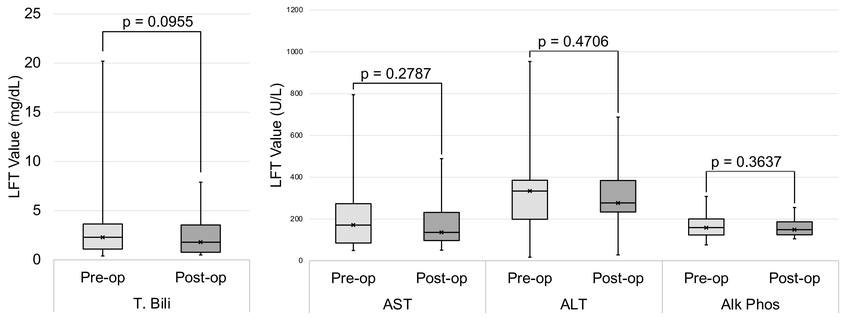

Figure 2. LFT Trends From Pre-Op to Post-Op Labs in Successful Pediatric LC+LCBDE Cases.

RESULTS (CONTINUED)

Post-op LOS analysis comparing successful LC+LCBDE cases with POST-LFTs (n=24) and successful LC+LCBDE cases with no POST-LFTs (n=8) demonstrated that post-op LOS was shorter in patients with no POST-LFTs (16hrs vs 26 hrs, p=0.03) (Figure 4).

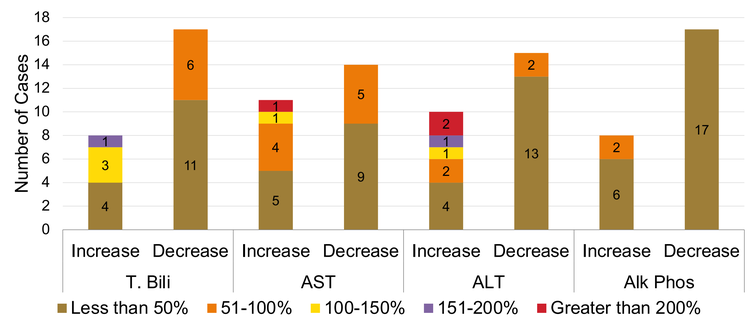

Figure 3. Changes in LFTs from Pre-op to Post-op Labs in Successful LC+LCBDE Cases. Values are separated by percent change from baseline labs (PRE-LFTs).

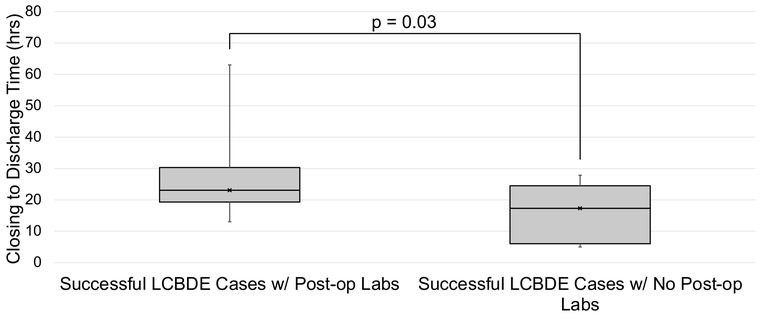

Figure 4. Post-Op LOS (Closing Time to Discharge) in Cases with Post-Op LFTs vs. Cases with No Post-Op LFTs.

CONCLUSIONS

POST-LFTs after successful pediatric LC+LCBDE do not consistently downtrend. Intraoperative surgical judgment and the patient's post-op status may be better criteria for discharge. While further research is necessary to confirm these findings, it appears safe to discharge pediatric patients without post-op LFTs after a clinically successful LC+LCBDE.

REFERENCES

1. Rogers SJ, Cello JP, Horn JK, et al. Prospective randomized trial of LC+LCBDE vs ERCP/S+LC for common bile duct stone disease. *Archives of Surgery*. 2010;145(1). doi:10.1001/archsurg.2009.226
2. Short SS, Frykman PK, Nguyen N, Liu Q, Berel D, Wang KS. Laparoscopic common bile duct exploration in children is associated with decreased cost and length of stay: Results of a two-center analysis. *Journal of Pediatric Surgery*. 2013;48(1):215-220. doi:10.1016/j.jpedsurg.2012.10.041