

Influence of discharge timing and diagnosis on outcomes of pediatric laparoscopic cholecystectomy

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Background. This study evaluated the influence of discharge timing (same day versus other) on 30-day hospital readmissions after laparoscopic cholecystectomy in pediatric patients. Wound complication and readmission rates also were evaluated among patients with different operative indications.

Methods. The database of the National Surgical Quality Improvement Program-Pediatric (2012–2015) was queried for patients <18 years old who underwent laparoscopic cholecystectomy. Patient and operative variables as well as timing of discharge were assessed. Same-day discharge was defined as zero days between operation and discharge and was compared with patients discharged on the first or second postoperative day. Primary outcome was hospital readmission within 30 days; secondary outcomes included surgical site infections and wound complications.

Results. From 2012–2015, 5,046 patients underwent cholecystectomy (75.0% female; median age 13.7 years). Postoperative diagnoses included cholelithiasis (69.6%), cholecystitis (16.3%), biliary dyskinesia (12.3%), and pancreatitis (1.8%); all other diagnoses were excluded from analysis. Same-day discharge occurred in 1,061 patients (21.0%). Overall rate of readmission was 3.6% (3.9% among patients discharged on postoperative day 1 or 2 and 2.1% for patients discharged on the same day as the operation, $P = .003$). When compared according American Society of Anesthesiologists classification, patients of class 3 and class 4 were associated with increased odds of 30-day hospital readmission when compared with class 1 (odds ratio 2.27, 95% confidence interval 1.32–3.89, $P = .003$ and odds ratio 7.62, 95% confidence interval 1.47–39.70, $P = .02$, respectively). Similarly, patients with hematologic comorbidities compared with those without comorbidities also had increased odds of 30-day readmission (odds ratio 1.88, 95% confidence interval, 1.19–2.96, $P = .007$). Same-day discharge was not associated with increased readmission (odds ratio 0.60, 95% confidence interval, 0.38–0.94, $P = .03$) when compared with later discharge. Reasons for readmission did not differ between the same-day and later discharge groups. None of the demographic or clinical characteristics, including discharge timing, indication or operation, and preoperative duration of stay, were associated with increased odds of wound complications.

Conclusion. In pediatric patients undergoing laparoscopic cholecystectomy, same-day discharge is not associated with increased 30-day hospital readmission rates or wound complications when compared to discharge in 1 or 2 days. Same-day discharge seems safe and may be an applicable quality indicator for pediatric patients undergoing laparoscopic cholecystectomy. (Surgery 2017;■:■-■.)

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Presented at the 12th Annual Academic Surgical Congress in Las Vegas, NV, February 7–9, 2017.

Accepted for publication July 27, 2017.

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0039-6060/\$ - see front matter

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<https://doi.org/10.1016/j.surg.2017.07.029>

THE NATURE OF BILIARY DISEASE IN CHILDREN has changed markedly throughout the past few decades with an associated increase in the rate of in cholecystectomys.¹ In 2012, cholelithiasis alone was reported at an incidence ranging from 1.9% to 4.0% in pediatric patients. Increased awareness of gallbladder disease as a cause of abdominal pain in children may be associated with changes in etiology as well as an increased use of ultrasonographic imaging.² Historically cited indications for

cholecystectomy in pediatric patients were limited to patients with hemolytic disease, pregnancy, and the use of oral contraceptives. The increasing epidemic of childhood obesity, such that approximately one-third of children are overweight or obese, and an increased incidence of functional disorders of the gallbladder are thought to account for the majority of the cholecystectomies performed in pediatric patients.³ The evolving indications for cholecystectomy suggest that risk factors in children for biliary tract disease have begun to mirror those observed in the adult population.

With the increase in diagnosed biliary tract disease, there has been a proportional increase in cholecystectomies performed in children. As documented previously in the adult population, a decrease in the threshold for cholecystectomy after the introduction of laparoscopic cholecystectomy may be a contributory factor.⁴ With an increasing trend toward laparoscopy, standardized outpatient procedures for operations, such as the appendectomy, herniorrhaphy, and cholecystectomy, have emerged in the adult literature. Few smaller series have evaluated laparoscopic cholecystectomy as a day-case in children, where discharge timing is based largely on the classification as “outpatient” or “ambulatory” with discharge within 23 hours and not “same day discharge.”⁵⁻⁸ To the best of our knowledge, no studies have been conducted on this scale to evaluate the safety and outcomes of same-day discharge after cholecystectomy in the pediatric population.

MATERIALS AND METHODS

The study protocol and use of the database of the American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) was reviewed by the Institutional Review Board of the State University of New York, University at Buffalo, and need for informed consent was waived (UB IRB: 820332-1).

Data source. We performed a retrospective review of the database of the ACS NSQIP-P for 2012–2015. The NSQIP is a multi-institutional, multispecialty, clinical database measuring surgical outcomes, including a sampling of cases by the majority of pediatric surgical specialties up to 30 days postprocedure in children <18 years old with the exclusion of trauma and transplant cases. Data are collected in 8-day cycles for a select group of operative procedures. Data collected include preoperative risk factors, procedure performed based on Current Procedural Terminology (CPT) code, and postoperative complications defined as those occurring within 30 days of index operation.

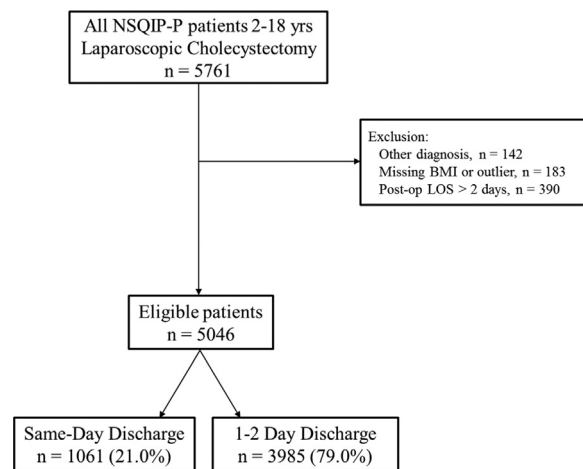


Fig. Patient selection.

Case selection. The study population was first defined as patients <18 years old. Patients were selected for data abstraction if they had undergone a laparoscopic cholecystectomy with or without intraoperative cholangiogram during 2012–2015 (CPT codes 47563 and 47562, respectively). ICD-9 codes were used to identify the indication for the operation or the diagnosis. Patients who underwent open cholecystectomy (CPT codes 47600; 47605) were excluded from analysis. Same-day discharge for the purposes of this study was defined as zero days between the laparoscopic cholecystectomy (index operation) and the date of discharge. The outcomes of these patients were compared with patients discharged within 2 days of operation (ie, postoperative day 1 or 2). Patients who were discharged on or after the third postoperative day were excluded based on suspected inherent differences in the patient population that would otherwise be considered eligible for “outpatient” surgical procedures (Fig).

Data collected or patient variables included age, sex, obesity, race and ethnicity, presence of hematologic comorbidities or diabetes mellitus (DM), preoperative duration of stay, and classification of the physical status according to ASA physical status. Obesity was defined according to the guidelines of the Centers for Disease Control and Prevention (CDC) as a body mass index (BMI) ≥ 95 th percentile, adjusted for age and sex. Extreme outliers (arbitrarily set at BMI <10 or BMI >100) were excluded, because they were thought to represent data errors. Outcomes of interest included 30-day overall morbidity; hospital readmission; and wound complications, including superficial surgical site infection, deep surgical

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