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Routine intraoperative cholangiography is unnecessary in patients with mild gallstone pancreatitis and normalizing bilirubin levels



Xuan-Binh D. Pham, M.D.^a, Christian de Virgilio, M.D.^a,
Lutfi Al-Khouja, B.S.^b, Michael C. Bermudez, B.S.^c,
Alexander C. Schwed, M.D.^a, Amy H. Kaji, M.D., Ph.D.^d,
David S. Plurad, M.D.^a, Steven L. Lee, M.D.^a, Robert S. Bennion, M.D.^e,
Darin J. Saltzman, M.D., Ph.D.^e, Dennis Y. Kim, M.D.^{a,*}

^aDepartment of Surgery, Harbor-UCLA Medical Center, 1000 West Carson Street, Torrance, CA 90509, USA; ^bDavid Geffen School of Medicine at UCLA, Los Angeles, CA, USA; ^cMeharry Medical College, Nashville, TN, USA; ^dDepartment of Emergency Medicine, Harbor-UCLA Medical Center, Torrance, CA, USA; ^eDepartment of Surgery, Olive View-UCLA Medical Center, Sylmar, CA, USA

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Abstract

BACKGROUND: The benefit of intraoperative cholangiography (IOC) is controversial in patients with gallstone pancreatitis whose bilirubin levels are normalizing. IOC with subsequent endoscopic retrograde cholangiopancreatography may lengthen duration of surgery and length of stay, whereas failure to clear the common bile duct may result in recurrent pancreatitis.

METHODS: We performed a 6-year retrospective cohort analysis of consecutive adult patients with mild gallstone pancreatitis undergoing same-admission cholecystectomy at 2 university-affiliated medical centers. Institution A routinely performed IOC, whereas institution B did not. The primary outcome was readmission within 30 days for recurrent pancreatitis.

RESULTS: Of 520 patients evaluated, 246 (47%) were managed at institution A (routine IOC) and 274 (53%) were managed at institution B (restricted IOC). Patients at institution B had a shorter duration of surgery (1.0 vs 1.6 hours, $P < .001$), shorter length of stay (4 vs 5 days, $P < .001$), and fewer postoperative endoscopic retrograde cholangiopancreatographies performed (1.8% vs 21%, $P < .001$), without a difference in readmissions (1.5% vs 0%, $P = .12$).

CONCLUSIONS: Routine IOC is not necessary in the setting of mild gallstone pancreatitis with normalizing bilirubin values.

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* Corresponding author. Tel.: +1-310-222-2345; fax: +1-310-533-1841.

E-mail address: dekim@dhs.lacounty.gov

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Gallstones are the most common cause of acute pancreatitis, accounting for nearly half of all cases.¹ Episodes of gallstone pancreatitis are typically milder in severity than those due to other etiologies as gallstone pancreatitis is thought to be caused by small stones that transiently obstruct the ampulla of Vater.² The definitive treatment for gallstone pancreatitis is a laparoscopic cholecystectomy performed

during the initial admission.³ Gallstone pancreatitis managed conservatively without any intervention has a rate of recurrence as high as 11% at 1 year and 23% at 5 years.⁴ Also, our institution has demonstrated prospectively that laparoscopic cholecystectomy within 48 hours for mild gallstone pancreatitis with normalizing laboratory values is safe and results in a shorter length of stay (LOS).⁵

The role of evaluating the biliary system in patients with mild gallstone pancreatitis and persistently elevated total bilirubin levels is clear. We have previously established that it is unnecessary to regularly image the biliary system with a protocol of routine preoperative endoscopic retrograde cholangiopancreatography (ERCP) as this results in longer lengths of stay, higher costs, and more interventions, all without significant differences in the rates of morbidity or mortality.⁶ Instead, selective preoperative ERCP should be considered in patients with a serum total bilirubin level of 4 mg/dL or higher on hospital day 2 as this is predictive of common duct stones with a specificity of 95%.⁷

In contrast, the role of evaluating the biliary system in patients with normalizing bilirubin levels remains unclear. Although the obstructing stone in these patients has most likely passed, Tabone et al⁸ argue that the ducts should still be evaluated with ERCP or intraoperative cholangiography (IOC) as they found common duct stones in as many as 33% of all patients with gallstone pancreatitis. Whether these common duct stones result in any clinical significance and the effect of routine IOC on clinical outcomes is still debated.^{9–11} Thus, we sought to compare the experiences of 2 institutions with vastly different protocols (routine IOC vs restricted IOC) for patients with mild gallstone pancreatitis and normalizing bilirubin levels. We hypothesized that foregoing IOC is safe in this subset of patients.

Methods

Study design

We performed a 7-year retrospective cohort analysis of consecutive adult patients with mild gallstone pancreatitis undergoing same-admission cholecystectomy at 2 university-affiliated county medical centers from 2008 to 2015. “Institution A” routinely performed IOC, whereas “institution B” did not. Medical records were identified by querying the hospital database for all patients who underwent a laparoscopic cholecystectomy or a laparoscopic cholecystectomy with IOC with a preoperative diagnosis of acute pancreatitis. Exclusion criteria included patients with the absence of gallstones on preoperative imaging, patients with other etiologies for pancreatitis, those with severe pancreatitis as defined by a Ranson’s score greater than 3, had a concomitant diagnosis of cholangitis, or who underwent a preoperative ERCP.

Institutional protocols

Laparoscopic cholecystectomy at both institutions was regularly performed with residents and during the same admission. A total bilirubin level was considered to be normalizing if it remained within normal limits when trended or if it was down-trending. In the setting of normalizing total bilirubin levels, both institutions proceeded to laparoscopic cholecystectomy without obtaining a preoperative ERCP. Institution A routinely performed IOC, whereas institution B rarely performed IOC. When not performing an IOC, institution B would trend the total bilirubin on postoperative day 1, and if normal, would not pursue any further interventions. If the total bilirubin remained elevated or rose, then a postoperative ERCP was performed. If there was suspicion for choledocholithiasis (based on common bile duct [CBD] diameter or highly elevated though normalizing total bilirubin levels) or abnormal anatomy was present, institution B would then perform an IOC. Results of IOC at both institutions were interpreted by the operating surgeons intraoperatively. In the setting of a filling defect, both institutions would attempt to clear the duct with flushing and glucagon administration. Postoperative ERCP with sphincterotomy was performed if a filling defect failed to clear.

Variables collected

Recorded values included patient age, ethnicity, diabetic status, pregnancy status, admission vital signs, admission laboratory values, hospital day 2 total bilirubin levels, Ranson’s score, bedside index for severity in acute pancreatitis score, pancreatitis ultrasound results including CBD diameter, computed tomography results, magnetic resonance imaging results, magnetic retrograde cholangiopancreatography results, day-of-surgery laboratory values, duration of surgery in hours, operative findings, IOC findings, conversion to open, and postoperative ERCP results including the presence of sludge or stones and whether a sphincterotomy was performed. An ERCP was considered postoperative if it was performed after surgery but before discharge. An ERCP was considered post-discharge if it was performed after discharge.

Outcomes

The primary outcome was readmission within 30 days for recurrent pancreatitis. Secondary outcomes included duration of surgery, preoperative LOS, postoperative LOS, and performance of postoperative ERCP.

Statistics and data management

All data were recorded in Excel 2010 (Microsoft, Redmond, WA). Statistical analysis was performed using both SAS, v9.3 (SAS Institute, Cary, NC) and Epi Info 7, v7.1.5.2 (CDC, Atlanta, GA) software. Continuous variables were analyzed using Student’s *t* test, but in the presence of

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