The American Journal of Surgery 195 (2008) 463–466
Clinical surgery—American

Is ductal evaluation always necessary before or during surgery for biliary pancreatitis?

Kaori Ito, M.D., Hiromichi Ito, M.D., Ali Tavakkolizadeh, M.B.B.S., Edward E. Whang, M.D., F.A.C.S.*

Department of Surgery, Brigham and Women's Hospital, Harvard Medical School, 75 Francis St, Boston, MA 02115, USA

Manuscript received February 23, 2007; revised manuscript April 5, 2007

Abstract

Background: Whether all patients undergoing cholecystectomy following an episode of biliary pancreatitis require direct common bile duct evaluation is controversial. We hypothesized such evaluation can be omitted safely among select patients at low risk for choledocholithiasis.
Methods: One hundred forty-eight patients undergoing cholecystectomy for biliary pancreatitis (January 1995–December 2005) met the following inclusion criteria: (1) no preoperative endoscopic retrograde cholangiography (ERC) or endoscopic retrograde cholangiopancreatography (ERCP); (2) normal or decreasing liver function tests (LFTs) preoperatively; and (3) no ductal dilation on non-invasive preoperative imaging. Group I had intraoperative cholangiography (IOC, n = 27); group II did not (n = 121).
Results: No differences between groups I and II were evident in postoperative retained-stone related events: recurrent pancreatitis (11% vs 8%, $P = .7$), cholangitis (0% in both groups), and asymptomatic LFT elevation (0% vs 3%, $P > .99$).
Conclusions: Direct ductal evaluation can be omitted safely in select patients undergoing cholecystectomy for biliary pancreatitis who are at low risk for choledocholithiasis.

Keywords: Biliary pancreatitis; Intraoperative cholangiography; Cholecystectomy; Choledocholithiasis

In the United States, more than 220,000 patients are admitted to the hospital each year with acute pancreatitis as the primary diagnosis [1]. Overall, the most common etiology for this condition is choledocholithiasis [2,3]. Standard recommendations for patients who have recovered from an episode of gallstone-induced (biliary) pancreatitis and are able to tolerate surgery include cholecystectomy, which is designed to eliminate the usual source of biliary stones and, hence, minimize the probability of recurrent pancreatitis.

An important consideration in the management of patients with biliary pancreatitis is the evaluation and treatment of persistent choledocholithiasis. Data derived from high-quality controlled clinical trials suggest that endoscopic retrograde cholangiopancreatography (ERCP) improves outcomes when performed early in the course of an episode of biliary pancreatitis in the subset of patients with evidence of common bile duct obstruction and in those with severe disease [4,5]. For the larger group of patients who recover from an episode of mild biliary pancreatitis and fail to exhibit evidence for biliary obstruction, direct evaluation of the biliary tree, through either ERCP or intraoperative cholangiography (IOC) at the time of cholecystectomy, is widely believed to be necessary in all patients [4]. However, few data support this belief [6].

We hypothesized that such direct biliary evaluation can be omitted safely in patients undergoing cholecystectomy following recovery from an episode of biliary pancreatitis who are at low risk for persistent choledocholithiasis. Our specific aim was to define a subset of these patients for whom IOC may be unnecessary, even in the absence of preoperative ERC or ERCP.

Methods

This study was conducted with the approval of the Brigham and Women's Hospital Institutional Review Board. Medical records of all 891 patients admitted with the diagnosis of acute pancreatitis at our institution from January 1995 through December 2005 were analyzed (patients

* Corresponding author. Tel.: +1-617-732-8669; fax: +1-617-739-1728.
E-mail address: ewhang1@partners.org

0002-9610/08/$ – see front matter
doi:10.1016/j.amjsurg.2007.04.017

were identified using the ICD-9 code for acute pancreatitis [577.0]). The diagnosis of acute pancreatitis was based on the presence of symptoms and signs of pancreatitis (eg, abdominal pain and tenderness) together with elevations in serum amylase and/or lipase concentration (to at least 3 times the upper limit of normal) [4]. A total of 463 of these patients were diagnosed to have acute pancreatitis of biliary etiology, based on the documentation of gallstones or choledocholithiasis on imaging studies. Three hundred fifty-five patients underwent cholecystectomy following their biliary pancreatitis episode.

We excluded patients documented to have necrotizing pancreatitis on contrast-enhanced computed tomography (CT) scan (n = 38), as the management of patients with severe acute pancreatitis (SAP) is distinct and has been the subject of previous reports [4,7,8].

In order to select patients at low risk for persistent choledocholithiasis at the time of cholecystectomy, we used the following study inclusion criteria: (1) normal or decreasing (ie, still abnormal but improving) liver function test (LFT) (serum total bilirubin, alanine aminotransferase, [ALT], aspartate aminotransferase [AST], and alkaline phosphatase concentrations) and serum amylase concentrations immediately prior to cholecystectomy, and (2) absence of bile duct dilatation on preoperative non-invasive imaging (transabdominal ultrasonography [US], CT, or magnetic resonance cholangiopancreatography [MRCP]). In order to specifically examine the utility of IOC, we excluded patients who underwent preoperative ERC or ERCP.

Based on these criteria, we excluded 178 patients who had persistently abnormal LFTs. Among patients who had preoperative imaging (355 patients had an US, 12 patients had a MRCP, and 141 patients had a CT scan), 59 patients who had ductal dilatation detected on 1 or more of these imaging tests were excluded. Additionally, 57 patients who underwent preoperative ERC and 85 patients who underwent preoperative ERCP were excluded. As a result, 148 patients comprised the study sample.

Group I patients underwent IOC (n = 27); group II patients underwent no IOC (n = 121). Whether or not IOC was performed was based on the preference of the operating surgeon. Data relating to demographic variables, comorbidities, operative procedures, IOC findings, postoperative retained stone-related events (defined as recurrent pancreatitis, cholangitis, and asymptomatic LFT elevations), postoperative complications, frequencies of re-operation and readmission within 3 months of discharge, total and postoperative duration of hospital stay, and overall morbidity and mortality rates were analyzed. Data were evaluated using 2-tailed Student *t* test and Fisher exact test, as appropriate. The criterion for statistical significant was $P < .05$.

Results

Groups I and II were similar with respect to demographic variables and comorbidities. The percentages of patients in groups I and II who were female were 67% and 71%, respectively ($P = .7$). Median ages of patients in groups I and II were 50 years (range 19–85 years) and 54 years (range 18–87 years), respectively ($P = .6$). No differences were evident between the 2 groups in percentages of patients with any comorbidity (89% vs 71%, $P = 0.1$), history of prior pancreatitis (0% vs 8%, $P = .2$), history of liver disease (4% vs 3%, $P = .6$), or history of alcohol abuse (0% vs 3%, $P > .99$). There were no differences between groups with respect to the interval between diagnosis to operation or duration of follow-up after discharge. The median follow-up period was 1,283 days (range 0–3,318 days) for group I and 1,198 days (range 0–3,383 days) for group II.

Ninety-four percent of patients had an attempted laparoscopic procedure, with an overall conversion rate of 3%. A greater percentage of group I than group II patients underwent open cholecystectomy (15% vs 3 %, $P = .04$). One patient (in group I) underwent common bile duct exploration at the time of cholecystectomy.

Among the 27 patients who underwent IOC, 2 (7%; 95% confidence interval 0%–17%) were found to have common bile duct (CBD) stones. One of these patients underwent open cholecystectomy with CBD exploration; the other patient had laparoscopic cholecystectomy with postoperative ERCP. The presence of a congenital annular pancreas in this latter patient prompted the surgical team to choose postoperative ERCP over CBD exploration. In the 25 patients (93 %) who had no evidence of choledocholithiasis on IOC, none were found to have retained stones postoperatively. One patient (4%) in group I, who required aggressive dissection in the vicinity of the CBD because of the presence of extensive adhesions, developed a postoperative CBD stricture, presumably related to CBD ischemia.

Frequencies of postoperative retained stone–related events were similar in both groups. No differences between groups I and II were evident with respect to incidences of postoperative recurrent pancreatitis (11% vs 8%, $P = .7$), cholangitis (0% in both groups), or asymptomatic LFT elevation (0% vs 3%, $P > .99$). Each of the patients who developed postoperative recurrent pancreatitis or asymptomatic LFT elevation underwent ERCP; in none of these patients were retained common bile duct stones documented during these examinations.

There were no differences detected between the 2 groups with respect to the incidences of CBD stricture (4% vs 0%, $P = .2$), wound infection (4% vs 0%, $P = .2$), bile leakage (0% vs 1%, $P > .99$), intra-abdominal abscess (0% vs 1%, $P > .99$), bleeding (0% vs 1%, $P > .99$), or small bowel obstruction (0% vs 1%, $P > .99$).

Furthermore, no differences were detected in the incidence of re-operation or of readmission within 3 months from operation, and duration of hospital stay between groups I and II (Table 1). There were no deaths in either group.

Comments

Understanding of biliary pancreatitis and its management have undergone evolution since initial description of a plausible mechanism underlying the pathogenesis of this condition by Opie et al over a century ago [9]. Prior to the 1980s, open cholecystectomy with IOC was the standard recommendation for patients recovering from an episode of biliary pancreatitis [8]. Introduction of ERCP during the 1980s was associated with considerable controversy regarding appropriate indications for and timing of its application in patients