

## Presence of choledocholithiasis in patients undergoing cholecystectomy for mild biliary pancreatitis

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**Introduction:** Standard recommendations for biliary pancreatitis include cholecystectomy with intra operative cholangiogram or ERCP during the same hospital admission. As ERCP is not widely available and expensive, cholecystectomy with IOC is routinely performed to rule out choledocholithiasis. However detection of common bile duct stones is challenging. Whether these patients undergoing cholecystectomy require direct common bile duct evaluation is controversial.

**Methods:** Patients admitted in the surgical ward in Patan hospital with the diagnosis of mild acute biliary pancreatitis that underwent cholecystectomy with intra operative cholangiography from August 2010 to July 2012 were studied. The outcome of cholangiogram was analyzed together with findings of common bile duct exploration. Objective of this study was to assess the presence of common bile duct stones in patients with resolving acute mild biliary pancreatitis.

**Results:** A total of 52 patients with acute mild biliary pancreatitis were operated during this period. The Common bile duct stone was found in 1.9%. Out of four patients with abnormal cholangiogram, only one patient (25%) had stone on exploration, rest of the three cases (75%) had negative exploration.

**Conclusions:** The presence of common bile duct stone in case of mild acute biliary pancreatitis undergoing cholecystectomy is very low (1.96%), and thus policy of selective IOC should be applied for cases with mild biliary pancreatitis.

**Keywords:** Biliary pancreatitis; Choledocholithiasis; Intra operative cholangiogram.

### Introduction

In the 1920s Moynihan described acute pancreatitis as “the most terrible of all intra-abdominal calamities”. It is generally agreed that biliary or gallstone pancreatitis is caused by either a transient or persistent obstruction of the ampulla of Vater by biliary calculi. Although the clinical course of pancreatitis is usually self-limited and benign, significant adverse outcomes with mortality rates approaching 9% have been reported.<sup>1</sup>

More recently it has become evident that among patients recovering from the first attack of acute gallstone pancreatitis, the risk of subsequent attacks is around 30 times higher than in comparison to the general population.<sup>2</sup> Because of this, treatment usually includes cholecystectomy in hopes of preventing further attack of pancreatitis.

An important consideration in management is the evaluation and treatment of persistent choledocholithiasis.

Approximately 45–70% of patients with acute biliary pancreatitis have common bile duct (CBD) stones found on endoscopic retrograde cholangiopancreatography (ERCP) or at surgery performed within 72 hours of admission.<sup>3</sup> Data derived from controlled clinical trials suggest that endoscopic retrograde cholangiopancreatography (ERCP) is beneficial when performed early in biliary pancreatitis, mostly for those patients with evidence of common bile duct obstruction and severe disease. For the remaining patients, who form the larger group, after recovering from an episode of mild biliary pancreatitis and fail to show any evidence for biliary obstruction, direct evaluation of the biliary tree, through either ERCP or intra operative cholangiography at the time of cholecystectomy, is believed to be necessary.<sup>4</sup>

Intra-operative cholangiogram (IOC) is a widely used method for detecting CBD stone as facility for ERCP is not easily available and majority of patient are from low socio-economic status. For years routine IOC has been performed in all cases with gallstone pancreatitis with the belief that CBD stone by itself is the risk factor for biliary pancreatitis. But the presence of CBD stone is rare at the time of surgery and this has lead surgeons to take a selective approach in performing routine IOC.

To date, the incidence of CBD stones among patients recovering from acute biliary pancreatitis has not been addressed in literature however it is well accepted that routine IOC in patients with pancreatitis should probably be abandoned due to the low yield of CBD stone on exploration.

## Methods

Institutional ethical clearance was obtained. This hospital based cohort study was conducted in the department of surgery in Patan and Bir hospital from August 2010 to July 2011, over a period of one year. All patients with resolved mild acute biliary pancreatitis undergoing cholecystectomy with intra-operative cholangiography during the study period were included in the study. Patient who underwent preoperative ERCP, those with severe pancreatitis, poor performance status, cholangitis, suspected hepatobiliary malignancy, USG showing CBD dilatation > 2cm, pregnancy, known allergy to iodinated contrast material and those with obvious choledocholithiasis on preoperative ultrasonography were excluded from the study. Detailed clinical history taking and examination were done. Complete pre-operative work up investigations and medical fitness for surgery were obtained. Patients were informed about the procedure and informed consent was obtained before the patient was subjected to surgery.

Diagnosis of acute biliary pancreatitis was established based on the presence of upper abdominal pain, more than threefold rise in serum amylase, visualization of gallstones on ultrasonography of abdomen.<sup>5</sup> Mild acute pancreatitis, as defined by Atlanta classification includes pancreatitis associated with minimal dysfunction, uneventful recovery with prompt normalization of physical signs and laboratory data, and absence of organ failure or local complications.<sup>5</sup> Pancreatitis was considered resolved when acute symptoms were absent and there was no upper abdominal tenderness and LFT and serum amylase were in decreasing trend. Serum amylase, lipase and LFT were repeated in the immediate preoperative period and surgery was performed only if they were in decreasing trend to near normal value. Normal laboratory values taken are mentioned: Serum amylase: 35-140 u/L, Liver function test: Total bilirubin: 0.2-1.2 mg/100 ml, Direct bilirubin: <0.3 mg/100 ml, SGOT (AST): 5-34 u/L, SGPT (ALT): <40 u/L, Alkaline phosphatase: 15 -112 u/L. Any values above the normal parameters were considered deranged or elevated. Ultrasound finding of CBD diameter >8mm was considered dilated.<sup>6</sup>

Data were collected on a structured performa. All cases underwent open cholecystectomy with IOC. The IOC was performed by inserting a 4 to 6 Fr feeding tube into the cystic duct and injecting 10 ml of Urografin® solution (Sodium diatrizoate, iodine based contrast, 76%) diluted with 10ml normal saline in a 20ml syringe. Two films were taken, one in right lateral head down position and second film in head up and left lateral position. Films were immediately interpreted by the operating surgeon. In case of suspicion for the possibility of CBD stone, choledochotomy was performed. IOC was repeated if dye did not reach the duodenum in spite of injection *Buscopan*® (Hyoscine butyl bromide injection), or the film exposure was unsatisfactory (CBD was not delineated properly).

Criteria of suspected CBD stone in IOC film were defined as one or more of the following<sup>7</sup>: Diameter of the common bile duct greater than 10 mm, filling defect(s) in the common bile duct, inadequate visualization of the lower end of the common bile duct or no contrast seen in the duodenum. If stones in the CBD were suspected, open cholecystectomy with choledochotomy and T-tube drainage were performed.

Patient who underwent ECBD and T tube placement, T tube cholangiogram was advised on 7<sup>th</sup> post operative day. If the cholangiogram was normal then the T tube will be clamped for 24 hours and if there were no symptoms like pain abdomen, fever, jaundice, cholangitis then T tube will be clamped and removed. If the cholangiogram showed any

filling defect then the patient would be advised for ERCP or Burhenne’s technique for stone removal. Statistical analysis was done by SPSS® software; version 12 and Microsoft excel software.<sup>8</sup>

**Results**

Open cholecystectomy with IOC was performed in the same hospital admission in 52 patients. Our study showed a female preponderance of 80.80% (Males: females = 1: 4.2). The mean age of the patients was 44.07 years ± 14.27 (ranging from 19-75 years) years. All of 52 patients presented with abdominal pain. The next common presenting symptom reported was nausea and vomiting which was seen in 40 patients (76.9%). Eight patients had previous history of acute pancreatitis and eight had past history of jaundice. All of 52 cases had elevated serum amylase more than 3 times of normal value. Among 52 cases, 19 had deranged LFT at admission which had decreasing tendency on repeat (immediate preoperative period) laboratory testing. In our study, eight patients (15.4%) had dilated common bile duct (>8mm) along with gallstone on ultrasound.

Among 52 cases, four patients underwent exploration of common bile duct (ECBD) with T-tube drainage due to suspicious IOC (Table 1). Intra operatively, dilated CBD (>1cm) was noticed in 3 cases (5.8 %). There were no intra operative complications attributable to the cholangiography. There was no failed IOC.

**Table 1: Surgical management of patients with resolving mild acute biliary pancreatitis (n=52)**

Name of surgery	Numbers	Percentage (%)
Cholecystectomy with IOC	48	92.31
Open cholecystectomy with IOC and ECBD	4	7.69
<b>Total</b>	<b>52</b>	<b>100</b>

Two cases (3.8%) showed anatomical variation in which cases the cystic duct was opened directly into the right hepatic duct. Four cases (7.69%) had IOC with suspicious of CBD stone among them two had filling defect and two had no flow into the duodenum. All four cases underwent ECBD, only one had stone in the CBD (one with the filling defect). In our study the presence of common bile duct stone in case of mild acute biliary pancreatitis was 1/52 (1.9%).

The mean preoperative hospital stay was 7.15 ± 1.13 days (5-9 days). The mean post-operative hospital stay was 4.93 days±1.34 (3-9 days) for cholecystectomy with IOC and 7.25 days± 0.5 (7-8 days) for open cholecystectomy with ECBD and T-tube drainage.

First follow-up for all discharged patients were at 7<sup>th</sup> post operative day. The post operative T tube cholangiogram was normal in all the four cases of ECBD at 2<sup>nd</sup> week. No symptoms of retained stones were found post-operatively. No patient reported any T tube related problems either before or after its removal. There was no readmission and reoperation in 12 months follow up period.

**Discussion**

Gallstone pancreatitis accounts for more than 40% of all pancreatitis cases annually. Traditional teaching indicates direct evaluation of the biliary tree through either ERCP or IOC in all patients undergoing cholecystectomy following an episode of biliary pancreatitis.<sup>5</sup> Despite the fact that most CBD stones pass on spontaneously, a variable number of stones remain in the common duct.<sup>9</sup> Facilities for immediate ERCP is not available in the hospitals involved in this study and the patients in our setting are usually from low socioeconomic conditions and are not able to afford ERCP which is expensive in comparison to routine IOC. Thus as a part of the usual treatment of gallstone pancreatitis, routine IOC at the time of cholecystectomy was performed for all our patients with the primary objective of identifying choledocholithiasis.

Out of 52 patients with resolving mild acute biliary pancreatitis, CBD stone was found in 1 (1.9%). Our finding of a detection rate of just 1.9% in these patients with mild gallstone pancreatitis who underwent IOC does not differ significantly from the frequency with which asymptomatic unsuspected CBD stones were historically noted on IOC.<sup>10</sup> A study by H Shayan showed that patients recovering from acute gallstone pancreatitis undergoing cholecystectomy after an average of 4.2 days had a 7.6% incidence of CBD stone.<sup>11</sup> Our study shows that patients recovering from acute gallstone pancreatitis who undergo cholecystectomy after an average of 7 days have a 1.9% prevalence of CBD stones. Paradoxically, although the likelihood of complications increases with increases in the preoperative time interval, the frequency with which stones can be expected to be found in the CBD decreases with increasing preoperative time. The magnitude of this decrease has been reported to range from 70% at the time of admission to less than 20% by hospital day four.<sup>12</sup> The mean length of hospitalization from admission to cholecystectomy was around seven

days in our study; this may be one of the reasons for low detection of CBD stone by IOC in our study.

Four cases showed abnormal IOC and underwent exploration of the CBD but only one out of four had CBD stone on exploration (25%). Out of the remaining 3 cases, two had abnormal IOC probably because of ampullary edema, and the other case had a filling defect, probably due to an air bubble. IOC is associated with false-positive rates as high as 3%.<sup>13</sup> The false positive rate was 75% (3/4) in the study which is quite high. This discrepancy between this study and the existing literature could be a result of the smaller sample size. This is similar to the study by Griniatsos J and his team who reviewed the diagnostic accuracy of IOC in cases highly suggestive of choledocholithiasis.<sup>14</sup> There were three false positive cases and one case of false negative result, all of which occurred in the subgroup of patients with a history of pancreatitis. They concluded that the PPV of the method decreases in patients with a history of pancreatitis (75%), while a negative result is highly suggestive of the absence of CBD stones (NPV = 98%). In our study 3 out of 4 cases were false positive and thus they underwent unnecessary ECBD.

In our study a total of 52 IOCs would have to be done to identify one case of choledocholithiasis. Suits et al concluded that 2135 IOCs would have to be performed for every one clinically significant CBD stone identified, in patients with symptomatic gallstone disease.<sup>15</sup> These data suggest that overwhelming majority of retained CBD stone pass spontaneously and thus IOC for every case of mild biliary pancreatitis is not necessary. The stone in our study from the CBD was <5mm in size thus stone of this size could not have caused persistent obstruction and could have passed spontaneously if waited. In a 5 year retrospective study by Shah JN et al evaluating the existing indications of IOC, past history of pancreatitis was associated with almost nil chance of finding CBD stones on exploration.<sup>16</sup>

Various studies have tried to identify variables in patients presenting with ABP which can reliably predict CBD stones. Telem et al felt that grouping significant predictors as opposed to individual values, would increase reliability of detection.<sup>17</sup> They found that increased CBD size on initial ultrasound, increased alkaline phosphatase, total bilirubin, direct bilirubin, gamma glutamyl transferase significantly correlated with presence of persistent stone. Though the case which had CBD stone on exploration had a previous history of jaundice, elevated liver function test, dilated CBD in USG and had intra operative findings of dilated CBD the sample size is too small to come to definite conclusion. To date no individual laboratory value or trend

has proven to reliably identify acute biliary pancreatitis patients at high risk of persistent CBD stone. Further studies need to be done.

### **Limitations of this research**

The lack of a control group in our study for direct comparison is a potential weakness of the study. Another limitation of this study is the small sample size. Given this small number it's difficult to reach value of statistical significance. Another factor was the short term follow-up of 6 months. There is little information available on the long-term sequelae of expectant management for asymptomatic bile duct stones in the general population.

### **Conclusion**

The presence of CBD stone in case of mild acute biliary pancreatitis is very low (1.96%), and thus policy of selective IOC should be applied for cases with mild biliary pancreatitis.

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