Outcome of laparoscopic cholecystectomy in acute biliary pancreatitis

Hayan A. Bismar, *MD, CABS,* ***Saleh M. Al-Salamah,*** *MBBS, FRCS.*

ABSTRACT

Objective: To evaluate the efficacy, safety, and timing of laparoscopic cholecystectomy in the management of mild to moderate cases of acute biliary pancreatitis.

Methods: The medical records of 158 patients admitted to Riyadh Medical Complex, Riyadh, Kingdom of Saudi Arabia (KSA) from July 1998 to December 2001 were retrospectively reviewed. Acute biliary pancreatitis was diagnosed in patients who presented with abdominal pain with serum amylase level 3 times the normal limits in the absence of hypercalcemia or hyperlipidemia and presence of gallstones on ultrasonography. Severity of the disease was assessed using Atlanta Symposium criteria. Preoperative endoscopic retrograde cholangiopancreatography (ERCP) was performed in 106 patients (74.6%) on selective basis. One hundred and eighteen patients underwent laparoscopic cholecystectomy after clinical and biochemical resolution of the attack. Standard 4–ports technique was used. Intraoperative and postoperative morbidity and mortality, and postoperative hospital stay were reported.

Results: Laparoscopic cholecystectomy was performed in 118 patients and it was possible in 110 cases (93.2%) after 3-8 days of admission. Preoperative ERCP was performed in 106 patients of mild to moderate acute biliary pancreatitis and common duct stones were retrieved in 19 cases (18%). The procedure was converted to open in 8 cases (6.7%). Postoperative complications were nausea and vomiting in 10, atelectasis in 8, chest infection in 3, and prolonged ileus in 2. The wound complication occurred in 4. One patient who had bile leak due to cystic duct stump avulsion at CBD junction was treated by endoscopic sphincterotomy plus stenting and another patient had partial CBD injury repaired primarily over a T-tube. Mean postoperative hospital stay was 2.4 days. One patient died due to uncontrolled arrhythmia and heart failure.

Conclusion: Laparoscopic cholecystectomy can be safely performed for mild to moderate acute biliary pancreatitis after clinical and biochemical resolution of the attack during the same admission with acceptable morbidity and mortality rates. This strategy will lead to reducing the recurring acute biliary pancreatitis, number of admissions and hospital stay.

Saudi Med J 2003; Vol. 24 (6): 660-664

The majority of acute biliary pancreatitis (ABP) is mild to moderate in severity. The initial management of such cases is medical. Nothing per mouth, IV fluids, and selective use of preoperative endoscopic retrograde cholangiopancreatography (ERCP) with or without endoscopic sphincterotomy (ES), for common duct stones, have been the mainstay of treatment. Cholecystectomy should be carried out in order to avoid recurring of ABP. During prelaparoscopic era, most surgeons delay cholecystectomy 6-8 weeks until the acute ABP resolves.[1,2] More recent studies have shown that ABP is best managed by cholecystectomy during initial admission for acute attack.[3] Laparoscopic cholecystectomy (LC) has become the operation of choice for gallstone management during the last

From the Department of Surgery (Bismar, Al-Salamah), Division of General Surgery, University Unit, Riyadh Medical Complex and the Department of Surgery (Al-Salamah), College of Medicine, King Saud University, Riyadh, *Kingdom of Saudi Arabia*.

Received 16th November 2002. Accepted for publication in final form 10th March 2003.

Address correspondence and reprint request to: Dr. Saleh M. Al-Salamah, Assistant Professor & Consultant General Surgeon, College of Medicine, King Saud University, PO Box 31168, Riyadh 11497, *Kingdom of Saudi Arabia.* Tel. +966 (1) 4671585/4350488. Fax. +966 (1) 4679493. E-mail: smsalamah@hotmail.com

decades. Recently there are many reports, which favored LC during the initial admission of ABP.[4-7] Our study aims to evaluate the role, timing and safety of LC during the index admission for ABP.

Methods. Between July 1998 to December 2001, the medical records of 158 patients admitted to Riyadh Medical Complex, Riyadh, Kingdom of Saudi Arabia, with the diagnosis of ABP were reviewed for age, sex, clinical presentation, duration of symptoms, biochemical and radiological investigation, severity of the illness, preoperative ERCP, hospital stay, surgical procedure, postoperative hospital stay, morbidity and mortality rates. Acute biliary pancreatitis was diagnosed in patients presented with acute abdominal pain with serum amylase level 3 times the normal range without hyperlipidemia. All patients had ultrasonography (USG) of the abdomen during the first 24 hours of admission. Severity of ABP was assessed according to Atlanta Symposium criteria[8] (the acute pancreatitis considered as severe attack if associated with organ failure; shock with systolic blood pressure of 90 mm Hg, pulmonary insufficiency with pO_2 of 60 mm Hg, renal failure, gastrointestinal bleeding, or in the presence of local complication such as necrosis, abscess or pseudocyst. Sixteen patients (10%) were classified as severe ABP and were excluded from the study, the remaining 142 patients were considered with mild to moderate ABP and subjected for further evaluation. The group of patients with mild to moderate ABP was treated initially on conservative basis with IV fluids, nothing per mouth, and IV antibiotics in cases with associated cholangitis. Preoperative ERCP + ES was performed in 106 cases of mild to moderate ABP, in 63 cases was carried out as routine procedure before LC, and in 43 cases was carried out selectively in the presence of persistent high serum amylase level >150 U/L after 4 days, persistent high liver function after 4 days of admission, dilated CBD >7mm, CBD stones identified by ultrasonogram and in the presence of associated cholangitis. Computed tomogram of the abdomen carried out in suspected severe attack to detect complication and in uncertainty of the diagnosis of acute pancreatitis. One hundred and eighteen patients underwent LC after the clinical and biochemical resolution of the ABP with mean of 5.3 days (range 3-8 days) from admission to time of surgery. A standard 4-ports technique was used. Postoperative hospital stay, morbidity and mortality related to ABP, endoscopic intervention and surgery were reported.

Results. From July 1998 to December 2001, 158 patients with ABP were admitted with a mean age of 39 years (range 17-85). There were 62 males and 96 females. The clinical, biochemical and radiological data are shown in **Table 1.** One hundred and forty-two patients had mild to moderate attack. All had the USG of the hepatobiliary system and pancreas carried out within 24 hours of admission. Gallstones were detected in 132 patients with sensitivity of 93%. CBD stones were reported in only 2 cases, dilated CBD >7mm in 21 cases (14.8%). Preoperative ERCP + ES were performed in 106 of mild to moderate cases (74.6%) of ABP. CBD stones were retrieved in 19 cases (18%). Endoscopic retrograde cholangiopancreatography was complicated in 4 cases. Two patients developed post sphincterotomy bleeding. One patient developed ascending cholangitis, and one had exacerbation of the ABP. All of these cases responded to conservative management. Endoscopic retrograde cholangiopancreatography was associated with morbidity rate of 3.7% and no mortality. Of the 142 patients with mild to moderate ABP, 4 had previous cholecystectomy and did not require further surgery after CBD was cleared of stone by ERCP. Laparoscopic cholecystectomy was also not required in 6 patients in whom stones were not detected on repeating USG. Seven patients were old age >70 years with multiple medical problems and ERCP served as definite treatment for this group, 7 patients preferred delayed cholecystectomy. The remaining 118 patients underwent LC during the index admission. The time from admission to surgery ranged from 3-8 days (median 5.3). Laparoscopic cholecystectomy was successfully completed in 110 patients with success rate of 93.2%. The procedure was converted to open in 8 cases, due to intraoperative bleeding in one case, bile leak in one case due to avulsion of cystic duct at its junction with CBD, and in one case due to partial CBD injury, which was repaired primarily with T-tube insertion, and difficult dissection in 5 cases due to associated chronic cholecystitis and distortion of the anatomy of Callots' triangle. Postoperative complications (**Table 2**) were persistent nausea and vomiting in 10 cases, atelectasis in 8, chest infection in 3, and prolonged ileus in 2. One patient developed enterocolitis associated with fever, vomiting, and stayed in the hospital for 7 days postoperatively. Wound complications occurred in 4 patients. One patient had minor bile leak from cystic duct stump treated by endoscopic sphincterotomy and stenting, the leak stopped after 4 days, one patient had partial CBD injury detected intraoperatively and confirmed by IOC, repaired primarily with T-tube insertion, postoperative cholangiogram was normal and the patient discharged on the eighth day postoperative after T-tube removal. Following LC (110 cases), 80 patients were discharged by second postoperative day; other 23 patients were discharged by 3-4 days post operation. The remaining 7 patients had more than 5 days postoperative. The postoperative hospital stay for the patients who underwent LC for mild to moderate ABP ranged from 1-8 days (median 2.4 days). One patient died postoperatively due to uncontrolled cardiac arrhythmia and heart failure.

Discussion. One hundred years ago Opie[9] has stated that biliary obstruction is the initiating event in ABP. In 1974 Acosta and Ledesma[10] established a

Table 1 - Clinical, biochemical and radiological data of all patients with acute biliary pancreatitis (N=142).

Clinical data	Value (%)
Age (years)	17-8
Sex ratio (male:female)	62:96
Previous history of cholecystectomy	4 (2.8)
Upper abdominal pain	142 (100)
Serum amylase	142 (100)
Raised liver enzymes	66 (47)
Gall stones on USG	132 (93)
CBD stones on USG	2 (1.4)
Dilated CBD	21 (14.8)
ERCP	106 (74.6)
Removal of CBD stones	19 (18)

USG - ultrasonography, CBD - common bile duct,
ERCP - endoscopic retrograde cholangiopancreatography

Table 2 - Morbidity of laparoscopic cholecystectomy for acute biliary pancreatitis.

Complications	n (%)
Chest infection	3 (2.7)
Wound complication	3 (2.7)
Bile leak	1 (0.9)
CBD injury	1 (0.9)
Ileus	2 (1.8)
Enterocolitis	1 (0.9)

CBD - common bile duct

Table 3 - Comparison of outcome of laparoscopic cholecystectomy in acute biliary pancreatitis.

Authors	Year	n of patients	Mean age (years)	Mean days before LC	Conversion ratio %	Postoperative hospital stay	CBD injury	Mortality
Canal and Broadie[5]	1994	29	47	3-7	0	2 days (76) 6 days (24)	none	0
Soper et al[6]	1994	38*	53	5, 8	0	2, 3	none	0
Bulkin et al[4]	1997	89*	-	-	16	-	-	2
Tang et al[15]	1995	122†	39.5	-	6.8	2, 4	-	-
Schietroma et al[24]	2001	59†	-	-	0	-	-	-
Present study	2002	118†	39	5, 3	6.7	2, 4	1	1

*number of patients underwent LC during initial admission. †number of patients with mild to moderate attack.
p value = 0.976 (not statistically significant p>0.05), LC - laparoscopic cholecystectomy, CBD - common bile duct

gallstone migration with transient blockage of the ampulla of Vater as the cause of ABP. Stones were recovered in the feces of 94% of their patients within 10 days of an attack. The majority (75-90%) of ABP cases are mild to moderate in severity. The management of such cases should start with conservative management and selective use of preoperative ERCP + ES. For the gallbladder stones, cholecystectomy should be carried out after the clinical and biochemical resolution of the attack.[11,12] This strategy avoids recurring attacks of pancreatitis in the interval between initial attack and cholecystectomy diminishes the total duration of hospitalization.[13,14] During the prelaparoscopic era most surgeons delay cholecystectomy until the acute phase of the disease resolves.[1,2] More recent studies have shown that ABP is best managed by cholecystectomy during the initial admission for acute attack.[3] Laparoscopic cholecystectomy has become the standard of care for the management of cholecystitis. During the last decade many series supported doing LC during initial admission.[4-7] In 1995, Tang et al[15] found that LC for severe cases of ABP during the first week of admission has been associated with an increase in operative complication, an increase rate of conversion to open and longer postoperative stay, but early operation can safely be recommended in patients with mild ABP. Ballesta et al[16] studied 73 patients with ABP, 63 of them had mild to moderate attack and underwent LC within 7 days of admission. The total hospital stay was 7.4 days. The other 10 patients with severe attack underwent LC within 8-30 days after the onset of the symptoms, with mean postoperative hospital stay of 8.2 days. Two cases were converted to open (2.7%), with 8 major complications (10.9%) and 2 deaths (2.7%). Another recent study by Uhl et al[17] in which 48 patients with ABP were reviewed.[17] Thirty-five patients had mild to moderate attack (73%) and 13 with severe pancreatitis, LC was possible in 35 case with success rate of 79% (35 out of 48), the median time between onset of symptoms and surgery was 10 days (range 4-19 days) in mild cases and 14 days (7-29 days) in the severe ones. The median operating time was 80 minutes and the hospital stay median 5 days. The total morbidity rate was 8% with no mortality. They concluded that LC is the treatment of choice for ABP and can be performed safely within 7 days in mild to moderate whereas in severe cases a period of 3 weeks at least should elapse.

In this study the LC was possible in 93.2% (110 of 118 patients). Surgery was carried out within 3-8 days after admission (median 5.3 days). The conversion rate was 6.7%. The major complications occurred in 8 cases (6.7%), with one CBD injury. One patient died with mortality rate of 0.8%. The postoperative hospital stay ranged from 1-8 days (median 2.4 days). Eighty patients were discharged on the second day, and 22 patients by 3-4 days. Remaining 7 patients had more than 5 days postoperative stay. The figures of our study are compatible with recent literatures (**Table 3**). Another controversial issue in the management of ABP is the management of suspected CBD stones. Preoperative ERCP is one of the good methods for diagnosis and endoscopic removal of CBD stones together with ES. Combination of LC for ABP with preoperative ERCP has been described previously.[18,19] In a previous study, we have shown that if routine preoperative ERCP performed in mild to moderate ABP an average of 18% of CBD stones were found, and it is associated with 3.6% morbidity rate, we believe that ERCP should be carried out on selective basis in cases of mild to moderate ABP.[20] Soper et al[6] concluded in their study that preoperative ERCP should be based on standard indications and does not need to be extended to all patients with ABP. Others have suggested doing intraoperative cholangiogram (IOC) during LC. If CBD stone found, a CBD exploration will be needed either laparoscopically if the technological facilities are available or conventional open CBD exploration should be carried out.[4,21,22] In order to avoid open CBD exploration a postoperative ERCP is another choice for CBD stone management. Pencev et al[23] reported a 100% success rate and removal of CBD stone after LC. Our policy is to do preoperative ERCP in cases where serum amylase still elevated (>150 U/L), persistently high liver functions after 4 days of admission, dilated CBD (>7 mm) and associated cholangitis. As the facilities of laparoscopic CBD exploration are not available in all hospitals we do not routinely perform IOC during LC for such cases. If the LC was converted to open we perform IOC and if it was positive for CBD stones we proceed to open CBD exploration.

We conclude that mild to moderate cases of ABP can be safely managed by LC after clinical and biochemical resolution of the attack during the index admission with acceptable morbidity and mortality rates. This strategy will reduce the risk of recurrent ABP while waiting for interval cholecystectomy as well as the number of admission and total hospital stay.

References

1. Ranson JHC. The Timing of Biliary Surgery in Acute Pancreatitis. ***Ann Surg*** 1979; 189: 654-663.
2. Kelly TR, Wagner DS. Gallstone Pancreatitis: A prospective randomized trial of the timing of surgery. ***Surgery*** 1988; 104: 600-605.
3. Stone HH, Fabian TC, Dunlap WE. Gallstone Pancreatitis: Biliary Tract Pathology in Relation to Time of Operation. ***Ann Surg*** 1981; 194: 305-312.
4. Bulkin AJ, Tebyani N, Dorazio RA. Gallstone pancreatitis in the era of Laparoscopic Cholecystectomy. ***Am J Surg*** 1997; 63: 900-903.
5. Canal DF, Broadie TA. Results of laparoscopic cholecystectomy for the treatment of gallstone pancreatitis. ***Am J Surg*** 1994; 60: 495-499.
6. Soper NJ, Brunt LM, Callery MP, Edmundowicz SA, Aliperti G. Role of laparoscopic cholecystectomy in the management of acute gallstone pancreatitis. ***Am J Surg*** 1994; 167: 42-51.
7. Schwesinger WH, Page CP, Gross GW, Miller JE, Strodel WE, Sirinek KR. Biliary pancreatitis: The era of laparoscopic cholecystectomy. ***Arch Surg*** 1998; 133: 1103-1106.

8. Bradley EL. A Clinically Based Classification System for Acute Pancreatitis: Summary of the International Symposium on Acute Pancreatitis. ***Arch Surg*** 1993; 128: 586-589.
9. Opie EL. The etiology of acute hemorrhagic pancreatitis. ***Bull Johns Hopkins Hosp*** 1901; 12: 182.
10. Acosta JM, Ledesma CL. Gallstone Migration as a Cause of Acute Pancreatitis. ***N Engl J Med*** 1974; 290: 484-487.
11. Kelly TR. Gallstone pancreatitis: The timing of surgery. ***Surgery*** 1980; 88: 345-350.
12. Schwesinger WH, Page CP, Sirinek KR, Levine BA, Aust JB. Biliary Pancreatitis: Operative outcome with a selective approach. ***Arch Surg*** 1991; 126: 836-840.
13. Paloyan D, Simonowitz D, Skinner DB. The Timing of biliary operations in patients with pancreatitis associated with gallstones. ***Surg Gynecol Obstet*** 1975; 141: 737-739.
14. Osborne DH, Imrie CW, Carter DC. Biliary surgery in the same admission for gallstone-associated acute pancreatitis. ***Br J Surg*** 1981; 68: 758-761.
15. Tang E, Stain SC, Tang G, Froes E, Berne TV. Timing of laparoscopic surgery in gallstone pancreatitis. ***Arch Surg*** 1995; 130: 499-500.
16. Ballesta LC, Ruggiero R, Poves I, Bettonica C, Procaccini E, Iervolino E. Laparoscopy in acute biliary pancreatitis. ***Panminerva Med*** 2001; 43: 227-228.
17. Uhl W, Muller CA, Krhenbuhl L, Schmid SW, Schlzel, Buchler MW. Acute gallstone pancreatitis: Timing of laparoscopic cholecystectomy in mild and severe disease. ***Surg Endosc*** 1999; 13: 1070-1076.
18. Chen FC, Hill DA, Hugh TB, Li B, Meagher AP. Endoscopic management of gallstone pancreatitis. ***Aust N Z Surg*** 1991; 61: 161-162.
19. Aliperti G, Edmundowicz SA, Soper NJ, Ashley SW. Combined endoscopic and laparoscopic cholecystectomy in patients with choledocholithiasis and cholecystolithiasis. ***Ann Intern Med*** 1991; 115: 783-785.
20. Al-Salamah SM, Bismar HA. Role of preoperative endoscopic retrograde cholangio pancreaticography in the management of mild to moderate acute biliary pancreatitis. ***Saudi Journal of Gatroenterology*** 2002; 8: 85-92.
21. Ballestra–Lopez C, Bastida–Vila X, Bettonica–Larranaga C, Zaraca F, Catarci M. Laparoscopic management of acute biliary pancreatitis. ***Surg Endosc*** 1997; 11: 718-721.
22. Schwesinger WH, Sirinek KR, Strodel WE III. Laparoscopic cholecystectomy for biliary tract emergencies: State of the art. ***World J Surg*** 1999; 23: 334-342.
23. Pencev D, Brady PG, Pinkas H, Boulay J. The role of ERCP in patients after laparoscopic cholecystectomy. ***American J Gastroenterol*** 1994; 89: 1523-1527.
24. Schietroma M, Carlei F, Lezoche E, Rossi M, Liakos CH, Mattucci S et al. Acute biliary pancreatitis: Staging and management. ***Hepatogastroenterol*** 2001; 48: 988-993.

Related Abstract
Source: Saudi MedBase

Saudi MedBase CD-ROM contains all medical literature published in all medical journals in the Kingdom of Saudi Arabia. This is an electronic format with a massive database file containing useful medical facts that can be used for reference. Saudi Medbase is a prime selection of abstracts that are useful in clinical practice and in writing papers for publication.

Search Word: acute biliary

Authors: A. M. Al-Shahri, A. R. Mohamed, M. A. Bushnak, M. A. Al-Karawi
Institute: Armed Forces Hospital, Riyadh, Kingdom of Saudi Arabia
Title: Acute biliary pancreatitis six and a half years experience
Source: Saudi Med J 1992; 13: 46-48

Abstract

During a 6 and half-year period 120 patients with acute pancreatitis were admitted to the Riyadh Armed Forces Hospital. Of the 120 patients, 40 had non-biliary pancreatitis; 80 patients (66.7%) had associated gallstones in whom the management as well as the outcome was retrospectively studied and 20 of these patients (16.7%) had severe attacks. Fifty-eight patients had conservative treatment followed by cholecystectomy, common bile duct exploration, or both and in 38 of these patients, the surgery was performed during the admission for the pancreatitis. Sixteen patients had endoscopic retrograde cholangiopancreatography with sphincterotomy and extraction of gallstones. Six patients had emergency surgery, one of who died. In patients with biliary pancreatitis, the outcome was best and duration of hospital stay shortest in those who had emergency endoscopic sphincterotomy, followed by those who had early surgery compared with those who had emergency or delayed surgery.