Original Research Article

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Endoscopic retrograde cholangio-pancreatograhy and laparoscopic cholecystectomy in single session management of acute biliary pancreatitis

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ABSTRACT

Background: World widely, the annual incidence of acute pancreatitis ranges from 5 to 50 per 100000. The major cause of acute pancreatitis is biliary calculi, which occur in 50-70% of patients. Aim of this study is to evaluate Endoscopic Retrograde Cholangio-Pancreatography (ERCP) and Laparoscopic Cholecystectomy (LC) as a single step management of early acute biliary pancreatitis.

Methods: A prospective study included 25 patients complaining of acute biliary pancreatitis. The study was done between December 2012 and February 2016 at Menofia University Hospital. All patients had acute biliary pancreatitis with obstructive jaundice proved by laboratory investigations and imaging. ERCP and LC in the same session were aimed in all patients.

Results: Successful same session was done in 24 (96%) cases and 1 (4%) case failed (just had ERCP only). Twenty cases (80%) were females and five cases (20%) were males. By ERCP, multiple small stones were extracted in 15 (60%) cases, biliary mud in 3 (12%) cases, a big stone in 2 (8%) cases and no stones were extracted in 5 (20%) cases. During laparoscopic cholecystectomy, bile stained ascites was present in 15 (60%) cases and absent in 9 (36%) cases. Calcium soap in 7 (28%) cases and absent in 17 (68%) cases. 17 (68%) patients stayed 24 hours in hospital while 6 (24%) patients stayed 48 hours and 2 (8%) cases stayed 72 hours. No mortality was recorded.

Conclusions: ERCP and LC as a single step is a good option for management of early acute biliary pancreatitis.

Keywords: Acute biliary pancreatitis, ERCP, Laparoscopic cholecystectomy

INTRODUCTION

Acute pancreatitis is a disease with multiple etiologies and a wide spectrum of outcomes, ranging from mild, self-limited illness, to severe decapacitating and life-threatening disease. It is an inflammatory process in which pancreatic enzymes autodigest the gland. The gland sometimes heals without any impairment of function or any morphologic changes; this process is known as acute pancreatitis. Pancreatitis can also recur intermittently, contributing to the functional and morphologic loss of the gland. The annual incidence of acute pancreatitis may range from 5 to 50 per 100000.

The two major causes of acute pancreatitis are biliary calculi, which occur in 50-70 per cent of patients, and alcohol abuse which accounts for 25 per cent of cases. The remaining cases may be due to rare causes or be idiopathic. Gallstone pancreatitis is thought to be triggered by the passage of gallstones down the common bile duct. If the biliary and pancreatic ducts join to share a common channel before ending at the ampulla, then obstruction of this passage may lead to reflux of bile or activated pancreatic enzymes into the pancreatic duct. Patients who have small gallstones and a wide cystic duct may be at a higher risk of passing stones. There are three primary objectives in the initial treatment of patients with

acute biliary pancreatitis. The first is to provide supportive therapy and to treat specific complications which may occur.⁴ Three most important issues are in treatment of acute pancreatitis initially are pain relief, fluid replacement and nutrition.⁵ The second is early conservative management with delayed or selective use of ERCP argue that early routine ERCP may lead to unnecessary ERCPs in the majority of patients as the offending gall stone has often passed before the diagnosis of pancreatitis is made.⁶ The third is endoscopic sphincterotomy and common bile duct drainage.

It is extremely important that all patients with biliary acute pancreatitis undergo laparoscopic cholecystectomy. If not done, there is a 30% probability of recurrence of acute pancreatitis within the next 3 months. The timing of cholecystectomy following ERCP for biliary pancreatitis can vary markedly depending on the severity of pancreatitis. The aim of this study is to evaluate Endoscopic Retrograde Cholangio-Pancreatography and Laparoscopic Cholecystectomy as an urgent single step management of acute biliary pancreatitis.

METHODS

Patients

This was a prospective study included 25 patients complaining of acute biliary pancreatitis. This study was done between December 2012 and January 2017 at Menofia University Hospital. All patients had acute biliary pancreatitis associated with obstructive jaundice proved by laboratory investigations (complete blood count, prothrombin time, liver and kidney functions test, total and direct bilirubin, alkaline phosphatase and serum amylase) and imaging (abdominal ultrasound). Shocked patients, patients need ICU admission and patients unfit for general anesthesia were excluded from the study and scheduled for conservative treatment.

Methods

Urgent Endoscopic Retrograde Cholangio-Pancreatography was done firstly for stone extraction in the operative room under C-arm machine by the surgeon and if succeeded followed by laparoscopic cholecystectomy in the same session.

Operative technique

ERCP was done in the operative room under C-arm machine by the surgeon. The patient lies in supine position till he was generally anesthetized then he was rotated to prone position with his arms adducted. The side-viewing duodenoscope passed through the mouth, pharynx, esophagus and the stomach till it reached the second part of the duodenum (face on position). The major duodenal papilla was visualized and cannulation was done (Figure 1 and 2). Radio opaque dye was injected inside CBD and a screen shot by the C-arm

machine was taken to ensure that cannulation was inside CBD not the pancreatic duct (Figure 3).



Figure 1: Visualization of major duodenal papilla.



Figure 2: Stone impacted at papilla.

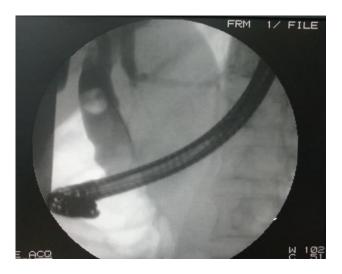


Figure 3: C-arm screen after dye injection with a filling defect (stone).

Then the guide wire was inserted through the cannula inside the CBD and exchanging process was started to remove the cannula and put the wire inside the CBD then the sphincterotome was inserted over the guide wire till it reaches the papilla. Sphincterotomy was started by the tip of the sphicterotome which contains a metal wire attached to the electrocautery. Good Sphincterotomy is achieved by making tension on the wire through the handle of the sphicterotome by the assistant (Figure 4).



Figure 4: Papilla and the sphicterotome.

The Sphincterotomy process was continued at the direction of 11 o'clock till reaching the major duodenal fold then exchanging process was started to remove the sphicterotome and insert the balloon. The balloon entered the CBD till the confluence and was inflated and multiple attempts of trawling were done till stones, mud and free bile came out of papilla (Figure 5 and 6). In some cases, the extraction basket was used for stone extraction which failed to be extracted by using the balloon.



Figure 5: C-arm screen with inflated balloon at the confluence.

After this successful ERCP the patient was rotated to supine position and a wide pore nasogastric tube was inserted to get rid of air inside duodenum and stomach.

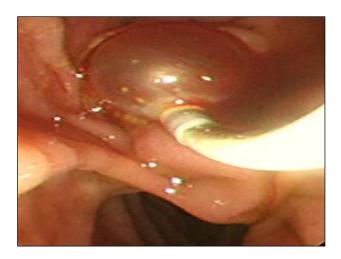


Figure 6: Balloon trawling at the papilla.

Initially, the skin was prepared by betadine then the operative field was draped. The umbilicus was hold by an Allis forceps then 1 cm transverse incision was done by a number 11 blade at the inferior aspect of the umbilicus and deepened through the subcutaneous tissue to the anterior rectus sheath. With a kocher clamp, the reflection of the linea alba on the umbilicus was grasped and elevated upwards. A Prolene one stitch was used to place U stitches on either sides of the kocher clamp then the sheath was elevated between the two stitches and a longitudinal incision was done then a 10 mm blunt trocar was placed intraperitoneal under supervision and CO2 insufflation was started to a maximum pressure 14 mmHg. White balance to the 0-degree laparoscope was done and was advanced slowly into the abdominal cavity. A two 5 mm lateral Trocars were inserted in the peritoneal cavity under direct vision after appropriate sites were chosen. One cm incision was made a finger breadth below Xiphoid process and deepened to subcutaneous tissue. A ten-mm trocar was inserted into the abdominal cavity making sure to be just to the right of falciform ligament then place the patient in reverse Trendlenberg position with the right side up to allow the small bowel and colon to fall away the operative field. By the help of the lateral grasper, the fundus of the gall bladder was held cephalad over the dome of the liver. The medial grasper was used to retract the infundibulum of the gall bladder in a caudolateral direction. This maneuver straightens the cystic duct, i.e., retracts it at a 90-degree angle from the CBD. In some cases, adhesions were present between gall bladder and omentum. These adhesions were dissected carefully sometimes by L-hook Electrocautery or by blunt dissection using Maryland (Figure 7). Carefully the cystic duct and artery were dissected and identified in the Calot's triangle till the critical view was obtained. The critical view is obtained by complete clearance of the areolar tissue in the subhepatic space, hold the infundibulum caudolaterally and use the electrocautery to dissect the peritoneum overlying infundibulo-cystic duct junction. Then incise the peritoneum along the medial aspect all the way to within 1 cm of the liver and then continue cephaled toward the fundus of the gall bladder. Then retract the gall bladder caudomedially and repeat a similar dissection on the lateral surface to get the lower third of the gall bladder free of peritoneum. Dissection was used to identify the cystic duct and artery entering the gall bladder.

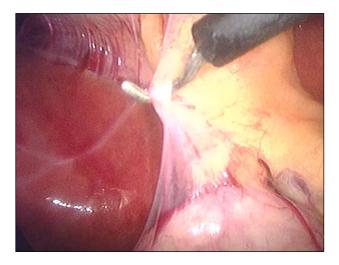


Figure 7: Dissection of adhesions at infundibulum by L-hook.

The cystic duct was clipped distally (toward the gall bladder) by one clips then a choledecotomy was done and milking of the cystic duct was performed to be sure that there are no missed stones in the duct then others two clipses were fitted proximally (toward CBD). Complete cut of the duct was done through the previous choledecotomy using the scissor (Figure 8). The artery was clipped by 2 clipses then was cut by L-hook Electrocautery. Once these structures were clipped and divided, the infundibulum was retracted cephalad and the hook was used to develop a plane in the areolar tissue between gall bladder and liver with smooth sweeping movements from right to left and back again.

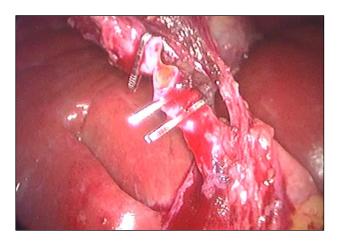


Figure 8: Clipping and cutting of cystic duct.

As with any surgery, traction and counter-traction is very important which was done by changing the position of the assistant's grasper. Any bleeding point in the gall

bladder fossa was controlled by the spatula. The gall bladder was separated and was held over the right upper quadrant. The laparoscope was transferred to the Subxiphoid port to take a look over the umbilical port. The gall bladder was pulled out through the umbilical port using the crocodile grasper and the final look and washing were done. In all Cases, a drain was inserted. Removal of ports was done under vision. The site of umbilical port was closed by using the two U stitches placed at the beginning of the procedure. All skin incisions were closed using 3/0 non absorbable suture and nasogastric tube was removed then the patient was extubated then transferred to post anesthesia care unit.

RESULTS

All patients were scheduled for urgent same session ERCP and laparoscopic cholecystectomy. Mean age was 46±15.8, range (20-65) year. Twenty cases were females (80%) and five cases were males (20%). The recorded success rate was 96% (24 patients), only 4% (one patient) had ERCP without laparoscopic cholecystectomy due to huge bulky pancreas compressing the duodenum.

Table 1: Operative and post-operative finding.

Parameter	Number = 25	Percent %
Sex	Trumber – 25	1 ercent /0
Male	5	20
Female	20	80
ERCP finding		
Big stone	2	10
Small stones	15	60
Mud	3	12
No stones	5	20
Laparoscopic finding		
Bile stained ascites	15	60
Calcium soap	7	28
Success rate		
Yes	24	96
No	1	4
Drain amount in first 24 hours (ml)		
Nil	9	36
Less than 50 ml	7	28
50-100 ml	6	24
More than 100 ml	2	8
Hospital stay		
24 hours	17	68
48 hours	6	24
72 hours	2	8

The mean operative time in minutes was 87.6±24.7 minutes. By ERCP, multiple small stones were extracted in 15 patients (60%), biliary mud in 3 patients (12%), a big stone in 2 patients (8%) and no stones were extracted in 5 patients (20%). There were 5 cases (20%) out of the 25 cases had stone impacted and pepping from the papillary orifice. During Laparoscopic cholecystectomy,

bile stained ascites was present in 15 (60%) cases and absent in 9 (36%) cases. Calcium soap was found in 7 cases (28%) and not present in 17 cases (68%).

Postoperatively, the amount in the drain in the first 24 hours was nil in 9 cases (36%), less than 50 ml in 7 cases (28%), between 50 to 100 ml in 6 cases (24%) and more than 100 ml in 2 (8%) cases. The drain was removed after 24 hours in 16 cases (64%), after 48 hours in 6 cases (24%) and the drain was left for 3 days in 2 cases (8%). Audible intestinal sounds were found within 12 hours in 17 cases (68%), within 24 hours in 4 cases (16%) and after 24 hours in 3 cases (12%). Twenty cases (80%) passed flatus within 24 hours postoperatively while 4 cases (16%) within 48 hours. Oral feeding was started within 24 hours in 21 (84%) cases, within 36 hours in 2 (8%) cases, within 48 hours in 1 (4%) case.

Seventeen (68%) patients stayed 24 hours in hospital while 6 (24%) patients stayed 48 hours and 2 (8%) cases stayed 72 hours. Two cases of mild pleural effusion were reported with no mortality.

DISCUSSION

Acute pancreatitis is an important cause of morbidity and mortality worldwide and the annual incidence appears to be increasing.⁹

It may occur when there is out of balance of factors involved in maintaining cellular homeostasis. The initiating event may be anything that injures the acinar cell and impairs the secretion of zymogen granules; examples include alcohol use, gallstones, and certain drugs.²

The major cause of acute pancreatitis is biliary calculi, which occur in 50-70 % of patients. Gallstone pancreatitis is thought to be triggered by the passage of gallstones down the common bile duct. Obstruction of this passage may lead to reflux of bile or activated pancreatic enzymes into the pancreatic duct.³

There are different strategies in management of patients with acute pancreatitis:

The first is to provide supportive therapy and to treat specific complications which may occur.⁴ Three most important issues in treatment of acute pancreatitis initially are pain relief, fluid replacement and nutrition.⁵

The second is early conservative management with delayed or selective use of ERCP argue that early routine ERCP may lead to unnecessary ERCPs in the majority of patients as the offending common bile duct stone has often passed before the diagnosis of pancreatitis is made.⁶

The third option, which was done in this study is early endoscopic sphincterotomy and CBD drainage plus

laparoscopic cholecystectomy in the same session as a single step management.

Same session management was succeeded in 24 patients (96%) and only one patient (4%) failed (just had ERCP without LC) due to huge bulky pancreas compressing the duodenum. Many actions were taken to increase the success rate. For examples, avoid excessive air inflation during ERCP, placement of wide pore nasogastric tube before LC to deflate the bowel and use open method for pneumoperitoneum to insert all ports under vision.

This study showed that only 5 patients (20%) had ERCP without stone extraction (unnecessary ERCP) while stones were extracted in 17 patients (68%) and biliary mud in 3 patients (12%). This result does not go with that of Tse F and Yuan Y, who said that early routine ERCP may lead to unnecessary ERCPs in the majority of patients as the offending common bile duct stone has often passed before the diagnosis of pancreatitis is made.⁶

Even in case of non-extracted stones in ERCP, Patients gain benefit from sphincterotomy to prevent missed stones in cystic duct after cholecystectomy to cause recurrent attacks of pancreatitis.

Five patients (20%) had ERCP with extraction of stone impacted and pepping from papilla. This helped in preventing progression of complications up to massive pancreatitis. This result correlate with Acosta JM who studied 61 patients with biliary pancreatitis and ampullary obstruction who were randomized to receive ERCP within 48 hours if signs of obstruction persisted for over 24 hours (study group, 30 patients) or conservative treatment and selective ERCP after 48 hours (control group, 31 patients). 10 Fourteen patients in the study group underwent ERCP (16 disobstructed spontaneously) and impacted stones were extracted in 79%. Patients in the study group had a lower incidence of immediate complications (3% versus 26%, p=0.026).¹⁰ Furthermore, patients with obstruction lasting ≤48 hours regardless of treatment group had significantly fewer immediate complications than those whose obstruction persisted for more than 48 hours (4% versus 78%, p<0.001). Present result also matches with Zerem E who said that ERCP and endoscopic sphincterotomy ameliorate the symptoms and the progression of the disease when applied early, desirably within 72 hours from the onset of the disease.11

The results of this study showed that there was early passing of flatus post operatively. Twenty (80%) cases passed flatus within 24 hours, four (16%) cases within 48 hours. This may be due to minimally invasive technique and due to air inflate intestine during ERCP.

The recorded short hospital stays as 17 patients (68%) stayed 24 hours in hospital while 6 patients (24%) stayed 48 hours and only 2 patients (8%) stayed 72 hours. This result correlates with Gurusamy KS et al, who said that

the total hospital stay was significantly shorter in the early laparoscopic cholecystectomy group than in the delayed laparoscopic cholecystectomy group (MD 2.30 days).⁸ Also, This matches with Gardner TB et al, as he showed that patients with mild gallstone pancreatitis, performing laparoscopic cholecystectomy within 48 hours of admission regardless of whether abdominal pain or laboratory abnormalities had resolved resulted in a shorter hospital stay.² Again, Liverani A et al, believe that one-step treatment is more comfortable for the patient and also reduces the mean hospital stay.¹²

In the present study, the incidence of postoperative complication was 8% (2 cases) in the form of mild pleural effusion. This matches with Bang KB et al result who mentioned that the frequency of complications from acute biliary pancreatitis was significantly higher in the conservative treatment group (35.7%) and lowest in the endoscopic sphincterotomy plus cholecystectomy group (5.0%, p=0.008). ¹³

There was no conversion to open surgery in our cases. This agrees with El Geidie AA who said that preoperative ERCP followed by laparoscopic cholecystectomy is the most commonly used treatment policy worldwide. 14 Early surgery was not found to be associated with increased risk of conversion and difficulties, or prolonged hospital There was no recurrence of acute biliary pancreatitis within the short term follow up. This agrees with Bang KB et al, who roported that significantly higher recurrence rates of acute biliary pancreatitis were observed in the non-endoscopic sphincterotomy group compared to the endoscopic sphincterotomy group (p < 0.01), and in the conservative treatment group compared to other intervention groups (p < 0.01). Also, Hazem Z underlined that the risk of recurrent biliary pancreatitis should be quite low if laparoscopic cholecystectomy is performed at the time of the ERCP.¹⁵ Toouli J et al, stated that in biliary pancreatitis, an urgent endoscopic sphincterotomy and common bile duct clearance has been recommended on the basis of earlier reports of its benefit.16 It is extremely important that all patients with biliary acute pancreatitis undergo laparoscopic cholecystectomy and if not done, there is a 30% probability of recurrence of acute pancreatitis within the next 3 months.⁷ The same conclusion was reported by Gardner TB et al, who mentioned that it is optimal for patients admitted with gallstone pancreatitis to undergo cholecystectomy before discharge, rather than (for example) being scheduled for a later date as an outpatient.² Patients discharged with gallstone pancreatitis without a cholecystectomy are at high risk for recurrent bouts of pancreatitis.

CONCLUSION

Endoscopic Retrograde Cholangio-Pancreatograhy and Laparoscopic Cholecystectomy as a single step management of acute biliary pancreatitis has many advantages include early regaining of intestinal sounds, early passing of flatus, early starting of oral feeding avoiding complications of parenteral nutrition, early ambulation avoiding complications of long recumbency, short hospital stay postoperatively, patients return to their normal life earlier, decreasing the risk of recurrent attacks of pancreatitis more than other methods as the source of stones was removed in the same session of ERCP, decreasing mortality and morbidity rate and low cost due to single hospital admission.

So, management of acute biliary pancreatitis by ERCP and LC as a single step is an effective, safe and has less complications than other methods of treatment. However other studies with a large number of patients are needed.

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Ethical approval: The study was approved by the institutional ethics committee

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