

Evaluation of laparoscopic cholecystectomy in cirrhotic patients

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Abstract

Background: Traditionally cholecystectomy in cirrhotic patients is restricted to severe biliary disease, because of high morbidity and mortality following the procedure. Laparoscopic cholecystectomy (LC) was originally contraindicated in cirrhotic patients because of associated portal hypertension and coagulopathy.

Patients and methods: Fifty cirrhotic patients underwent LC in Ain Shams University Hospital from January 2007 till December 2008.

Results: There were no mortalities in our group. Mean age was 45.6 years and mean operative time was 74.5 min. Conversion to open cholecystectomy occurred in 12 patients (24%). Postoperative complications occurred in 9 patients (18%). Mean hospital stay was 3.4 days in Child A and 6.8 days in Child B.

Conclusion: Laparoscopic cholecystectomy can be performed safely in cirrhotic patients with well compensated liver functions.

Introduction:

The prevalence of gall stones in patients with liver cirrhosis is as twice in comparison to general population.¹ Although mostly asymptomatic and having lower incidence of complications, these complications can be life threatening in cirrhotic patients.² The risk of biliary surgery in patients with liver cirrhosis can be reduced by preoperative preparation but the problem of unknown cirrhotics remains.³ Until recently, liver cirrhosis has been considered to be a contraindication to laparoscopic cholecystectomy. Now there is increasing evidence that patients with liver cirrhosis may safely undergo laparoscopic cholecystectomy with results superior to open cholecystectomy.⁴ Selection of patients with liver cirrhosis according to the liver reserve is the key issue for safe laparoscopic cholecystectomy.⁵ Our study is to evaluate the safety and efficacy of laparoscopic cholecystectomy in patients with liver cirrhosis.

Patient and methods:

Over a period of 24 months (from January 2007 till December 2008) at Ain Shams University Hospital, 50 consecutive patients with cholelithiasis associated with liver

cirrhosis underwent laparoscopic cholecystectomy. Cirrhosis was either diagnosed preoperatively or discovered retrospectively intraoperatively. Preoperative diagnosis of cirrhosis was determined according to clinical history and laboratory data. All patients were subjected to preoperative investigations in the form of complete blood picture, liver function tests, hepatitis markers, renal function tests, prothrombin time and abdominal ultrasonography to assess liver parenchyma, gall bladder wall, number and size of stones, biliary radicals and ascitis. Patients proved to have liver cirrhosis preoperatively were classified according to Child classification to either Child A or B. All patients were given antibiotic prophylaxis before induction of anesthesia. Reusable instruments were used. Patients were positioned in supine position. The operative procedure was standardized as laparoscopic cholecystectomy. All patients had the open Hasson technique for insertion of umbilical port with inspection of the liver and gall bladder then all other ports were placed by prior transillumination of the abdominal wall through the scope of the umbilical port **Figure(1)**.

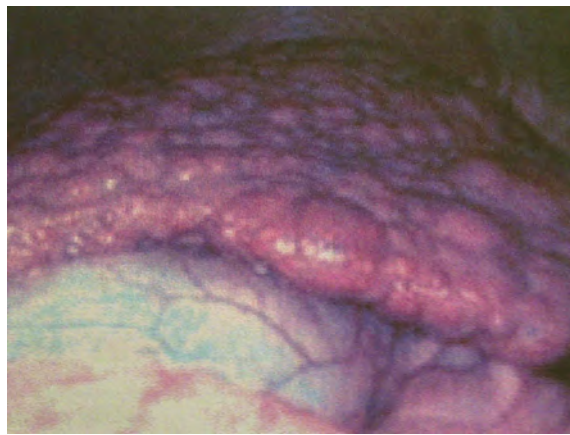


Figure (1)

The subxiphoid 10mm port was placed more to the right of the midline to completely avoid the falciform ligament and its accompanying umbilical vein. Traction of the gall bladder

was kept to minimum. Dissection of cystic pedicle was carried out with a variety of instruments e.g. Maryland's grasper or electro-surgical hook knife **Figure(2)**.

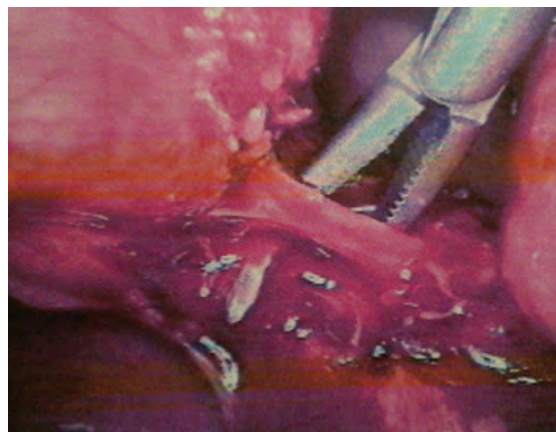


Figure (2)

The cystic duct and artery were divided between two proximal and single distal clips. The gall bladder was dissected from the gall bladder bed in the liver by electro-cautery and was removed from the 10mm epigastric port. Suction irrigation was not done routinely. Closed suction drain was used. Ports were removed. Fascia of the 10mm ports was sutured using absorbable sutures, skin is then closed by non absorbable sutures.

Results:

Our study included 50 patients with cholelithiasis and liver cirrhosis underwent laparoscopic cholecystectomy from Jan. 2007 till Dec. 2008. The study included 14 males and 36 females, their mean age was 45.6 years (range 22-65 years). The indication for the operation was recurrent attacks of biliary colic

in 46 patients and acute cholecystitis in 4 patients. 16 patients (32%) were diagnosed preoperatively by ultrasound to have liver cirrhosis, whereas 34 patients (68%) were discovered intraoperative. Ultrasonography was done pre-operative for those patients and revealed normal liver in 10 patients, fatty liver in 20 patients and hepatomegaly in 4 patients. 16 (32%) patients had elevated liver enzymes, 12 of them were having markedly elevated liver enzymes (2-3 times normal). Serum albumin was low in 10 patients (20%) (2.7-3.2 gm/dl). Serum bilirubin was elevated in 6 patients (12%) (1.8-3.1 mg/dl), 2 patients of them were having bilirubin level above 2.5mg/dl for whom ERCP was done to remove CBD stones. Prothrombin time was prolonged 5 seconds above normal control in 2 patients (4%) , 2 seconds above normal in 2 patients

(4%), 1 second above normal in 8 patients (16%) and normal in 38 patients (76%). 12 (24%) patients were Hepatitis C virus +ve and 4 patients (8%) were Hepatitis B virus +ve. Upper GIT endoscopy was done preoperatively for 4 patients, 2 patients (4%) were diagnosed to have non bleeding esophageal varices and 2 patients (4%) had lower end esophagitis and gastritis. Postoperatively 2 patients (4%)

developed haematemesis; upper GIT endoscope was done and revealed bleeding varices. According to Child classification; 40 patients (80%) were Child A, 27 of them (54%) gained score 5 and 13 (26%) gained score 6. 10 patients (20%) were Child B; 6 of them (12%) gained score 7, 2 patients (12%) gained score 8, 2 patients (12%) gained score 9. No patients with Child C were included in the study.

Table (1): Postoperative morbidity and length of stay stratified according with Child Pugh classification.

Child classification		
No. of patients	Child A	Child B
	40	10
Post operative morbidity		
Haematemesis	0	2
Wound infection	1	2
Ascitis	1	2
Biliary leakage	1	0
Length of hospital stay		
Mean days	3.4	6.8
Conversion	4	8

There was statistically significant difference in the outcome comparing Child A with Child B patients.

The hospital stay was prolonged in Child B patients, so it can be seen that Child's B cirrhosis have significantly greater risk of bleeding, rate of conversion to open cholecystectomy and prolonged hospital stay. None of the cirrhotic patients developed postoperative liver cell failure or hepatic coma.

Operative details:

38 procedures (76%) were completed laparoscopic within a mean time 74.5 min (Range 20-120 min), whereas 12 procedures were converted to open cholecystectomy after 10 to 30 min from the start of the laparoscopic trial. Causes of conversion were as follows:

In 5 patients; conversion was due to uncontrolled bleeding either from port sites (3 patients) or from the adhesions at Callot' triangle (2 patients). Only 1 patient required intraoperative blood transfusion and fresh frozen plasma. In 4 patients there were extensive adhesions at Callot triangle obscuring normal anatomy. In 2 patients due to severely contracted intrahepatic gall bladder with thick wall that couldn't be grasped by laparoscopic instruments. In one patient there was bleeding from liver attachments at dissection that couldn't be controlled laparoscopically.

Discussion:

Cholelithiasis is a common disease among patients with cirrhosis.⁶ Open cholecystectomy in cirrhotic patients is associated with high morbidity and mortality rate up to 17 to 27%.^{7,8} In early surgical experiences with LC, cirrhosis was thought to be absolute or relative contraindication because of potential risks of bleeding and liver failure.^{8,9} Only patients with Child's class A and B cirrhosis were operated on.

In our study:

Ascitis developed in 3 patients. All resolved with medical management. We believe that ascitis should be looked for in the postoperative period. We currently advise our patients to restrict dietary salt and water and to record daily weight. The patients are seen weekly for one month and if ascitis is suspected spironolactone is prescribed. 3 patients

developed wound infection in the 3rd postoperative day in whom the operation was converted to open cholecystectomy. The condition was improved by daily dressing and medical treatment.

2 patients (4%) experienced postoperative haematemesis and underwent upper GIT endoscopy which revealed esophageal varices. Injection sclerotherapy was done for both patients **Table(1)**. In one patient where the procedure was completed laparoscopic, biliary leak was noticed on the 3rd postoperative day (500 cc in the haemovac in 24 hours). The patient underwent ERCP, which revealed slipped clip. A stent was inserted during ERCP, and the patient was discharged on the 7th postoperative day in good general condition.

Several studies have examined the efficacy and safety of LC in cirrhotics and results have been encouraging **Table(2)**.

Table (2): LC in patients with Child's A and B cirrhosis.

Author	Year	No. of patients	Child-Pugh		Morbidity, n (%)	Hospital stay	Operative time
			A	B			
Urban et al ⁴	2001	19	19	0	0	3.5	64
Clark et al ¹¹	2001	23	14	9	13 (52)	4	107
Tuech et al ⁹	2002	26	22	4	7 (27)	5	126
Yeh et al ¹²	2002	226	193	33	15 (6.6)	4.5	--
Cucinotta et al ⁷	2003	22	12	10	8 (36)	5	115
Wu Ji et al ¹⁰	2004	34	19	15	7 (13.2)	--	--
Our study	2008	50	40	10	9 (18)	5	74.5

These data seem to be correlated with several causes. Magnification of the surgical field in laparoscopy permits meticulous hemostasis. Furthermore when performing LC in cirrhotic patients some modifications should be made to avoid the risk of heavy bleeding. First, avoid bleeding from periumbilical wall varices. Second, transillumination of the abdominal wall by the laparoscope helps to identify major collaterals in the abdominal wall. Third, placement of the subxiphoid port

should be more to the right of the midline to avoid injury of the falciform ligament. Fourth, excessive traction must be avoided to prevent avulsion of the gall bladder from the liver bed and bleeding.

Based on our results as well as those of others, LC is safe procedure that should be the treatment of choice for symptomatic cholelithiasis or cholecystitis in well-selected Child-Pugh A and B cirrhotic patients.

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