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Retrospective survey on laparoscopic cholecystectomy in the cirrhotic patient

A. CAPPELLANI, B. CACOPARDO§, A. ZANGHÌ, A. CAVALLARO, M. DI VITA, G. ALFANO, E. LO MENZO*

General Surgery and Senology, Department of Surgery, University of Catania (Italy)
§Sezione Malattie Infettive, Dipartimento Medicina Interna e Medicina Specialistica, University of Catania (Italy)
*Department of Surgery, School of Medicine, University of Miami, VAMC, Miami, Florida (USA)

Abstract. – Cholelitiasis is a common disease in patients with liver cirrhosis, mainly due to intravascular haemolysis and functional alterations of the gallbladder. In Child A and B cirrhotics laparoscopic cholecystectomy (LC) demonstrated the same advantages and safety as in the non cirrhotic patients. On the contrary, indications for surgery in Child C patients should be carefully evaluated. Nevertheless, the current number of patients with Child C cirrhosis submitted to LC is too low to extrapolate definitive data. Here we report our observations on a retrospective case series of LCs performed for symptomatic biliary disease in patients affected with liver cirrhosis.

Both medical records and surgical registers were used to collect pre-operative, intra-operative and post-operative data from 40 cirrhotics out of 921 patients operated by laparoscopic cholecystectomy between November 1996 and November 2006.

All patients underwent LC because of symptomatic disease. The average duration of the laparoscopic intervention was 111 minutes (60-220 minutes) distributed as follows according to the severity of liver disease: 66 minutes (48-87) in the Child A group, 108 minutes (91-119) in the Child B group and 138 minutes (110-160) as refers to Child C cirrhotics. Median blood loss was quantified as 80 ml (28-97) in Child A group, 155 ml (130-180) in Child B group and 300 ml (220-500) among Child C cirrhotics. The median length of hospital stay was 6 days (3-9 days) in the Child A group, 9 days (7-13 days) in the Child B group and 21 days (16-27 days) in Child C cirrhotics. Three cases out of 40 (7,5%) died: 2 Child C and 1 Child B.

In conclusion, this study confirms that in patients affected with Child A and B cirrhosis LC may be safely performed either in emergency or in election whereas as refers to Child C cases we have observed a slightly higher mortality but a relevant higher impact of non lethal complications.

Key Words:

Laparoscopic cholecystectomy, Liver cirrhosis, Child-Pugh classification, Risk factors.

Introduction

Acute cholecystitis resulting from obstruction of the cystic duct is associated to gallstone disease in approximately 95% of cases. Cholelitiasis is a common disease in patients with liver cirrhosis, mainly due to intravascular haemolysis and functional alterations of the gallbladder[1,2]. Some of the agents responsible for the progression of chronic liver disease towards cirrhosis such as hepatitis C virus (HCV) and alcoholic consumption are well known risk factors for gallstone disease[2]. Nevertheless, in a recent survey among 79 italian hospitals, subjects with HCV-related cirrhosis were more likely to develop gallstone disease[3]. Early cholecystectomy is the standard treatment for acute cholecystitis as well as for symptomatic gallstone disease. Laparoscopic cholecystectomy (LC) is generally considered as a safe and effective procedure even in cases of acute inflammation of the gallbladder. There is increasing evidence that patients with early cirrhosis may undergo LC with low morbidity and low mortality, whereas in patients with advanced cirrhosis a high risk for surgery has been highlighted and still is under debate[4]. In these pa-

Corresponding Author: Bruno Cacopardo, MD; e-mail: cacopardobruno@inwind.it

tients, the surgical risk is often increased by the presence of several comorbidities such as diabetes, coagulopathy and leukopaenia. Nevertheless, the current number of patients with Child C cirrhosis submitted to LC is too low to extrapolate definitive data. Here we report our observations on a retrospective case series of LCs performed for symptomatic biliary disease in patients affected with liver cirrhosis.

Patients and Methods

Between November 1996 and November 2006, 921 laparoscopic cholecystectomies (LCs) were comprehensively performed at the Unit of General Surgery of the Department of Surgery, University of Catania. In January 2007, we retrospectively revised the medical records and ascertained that 40 of the 921 cases (4%) were affected with liver cirrhosis as assessed by clinical or histological data. Both medical records and surgical registers were used to collect pre-operative, intra-operative and post-operative data from each patient.

Results

The diagnosis of liver cirrhosis had been made prior to the surgical procedure in all cases but 2. Pre-operative diagnostic evaluation included abdominal ultrasonography in all cases, abdominal computerized tomography in 15 cases, oesophagogastroscopy in 15 cases.

Table I summarizes the epidemiological and clinical characteristics of the 40 cirrhotics.

All patients underwent laparoscopic surgery because of symptomatic disease: recurrent abdominal pain in 15 cases, acute cholecystitis in 14 cases and biliary pancreatitis in 11 cases. Fifteen out of 40 patients (37%) had relevant comorbidities such as chronic obstructive pulmonary disease in 5 cases, diabetes in 8 cases, chronic coronary disease in 2 cases. The status of surgery was elective in 16 cases and emergent in 24 cases.

Table I. Clinical and epidemiological characteristics of the 40 cirrhotics submitted to LC.

N°	40
Age (years)	62 ± 12
M/F	18/22
Etiology	
HBV (n.)	9
HCV (n.)	19
Alcohol (n.)	7
Other (n.)	5
Child-Pugh	
Child A (n.)	20
Child B (n.)	10
Child C (n.)	10
Portal hypertension* (n.)	13
Ascites (n.)	9

*as diagnosed by oesophagogastroscopy for varices or by portal vein diameter ultrasonographic measurement.

Table II shows the distribution of elective and emergent interventions according to Child Pugh classification. Coagulopathy was observed in 13 subjects (all those 10 patients classified as having Child C cirrhosis and 3 out of 10 in the Child B group) and corrected with fresh frozen plasma immediately before the surgical procedure. The laparoscopic approach was attempted in all 40 cases but 3 cases required conversion to open procedure because of severe bleeding in 2 cases (Child C) and unclear hilar anatomy in one single case (Child B). Local haemorrages were controlled by using ultrasonic energy and thrombin fibrinogen sponge. Vasopressine was used in 7 of 10 Child C cases either intra- or post-operatively in order to enforce the haemostatic effect.

The average duration of the laparoscopic intervention was 111 minutes (60-220 minutes) distributed as follows, according to the severity of liver disease: 66 minutes (48-87) in the Child A

Table II. Distribution of elective or emergent interventions according to Child Pugh classification.

	N°	Child A	Child B	Child C
Elective	16	11	5	–
Emergent	24	9	5	10

group, 108 minutes (91-119) in the Child B group and 138 minutes (110-160) as refers to Child C cirrhotics.

Median blood loss was quantified as 80 ml (28-97) in Child A group, 155 ml (130-180) in Child B group and 300 ml (220-500) among Child C cirrhotics. Only 3 patients affected with Child C cirrhosis required post-operative blood transfusions (one operated with laparoscopic approach, the remainders converted to open intervention).

The median length of hospital stay was 6 days (3-9 days) in the Child A group, 9 days (7-13 days) in the Child B group and 21 days (16-27 days) in Child C cirrhotics.

Three cases out of 40 (7,5%) died during the perioperative period: one Child B patient, who had to be converted to open procedure, died of myocardial infarction on postoperative day 4 whereas two Child C cirrhotic died on postoperative day 6 and 7 because of liver failure and variceal bleeding respectively.

Table III details the frequency and the characteristics of post-operative non lethal complications in accord with Child Pugh classification.

Discussion

Since 1993 an increasing number of reports on laparoscopic cholecystectomy for symptomatic cholelithiasis in cirrhotic patients appeared in the literature. The great majority of them included Child A and B patients. In these cases, the laparoscopic technique demonstrated the same advantages as in the non cirrhotic patients[5,6]. Additional advantages from the minimally invasive technique included the potential, although controversial, tamponade effect of the pneumoperitoneum[7-9], the smaller incision size which reduces both the chance of bleeding and the risk of infection and, finally, the almost absolute absence of adhesions which might result ideal in the prospective of a future liver transplantation[8].

Curro et al[10] and Palaniveniu et al[11] confirmed recently that LC is a safe procedure in Child A and B cirrhotics with symptomatic cholelithiasis. Eventually, appropriate modifications of subtotal cholecystectomy may be adopted to avoid complications, depending on the presence of relevant risk factors. On the contrary, indications for surgery in Child C patients should be carefully evaluated and reserved to emergency cholecystectomy[12].

In Child C cirrhotics, the haemorragic risk represents the primary concern and Shiff et al[13] suggested that the preoperative degree of coagulopathy more than the Child's class should guide the surgeon's approach. Also, Grubnik et al[14] remarked the heavy burden of haemorragic omplications (from intraabdominal haemorrage to gastrointestinal variceal bleeding) in late cirrhotics submitted to emergent LC.

This study confirms that in patients affected with Child A and B cirrhosis LC may be safely performed either in emergency or in election, with a low risk of severe complications and a low probability of conversion to open surgery. Ibrahim et al[15] documented that chronic liver disease is not a risk factor for conversion to open surgery in patients undergoing LC.

Also, in our study, the average duration of surgery, the operative blood loss and the length of hospital stay were in accord to literature data[4,5,16] and strictly paralleled the severity of liver disease.

In a recent metanalysis by Puggioni et al[4], LC was associated with less operative blood loss,

Table III. Characteristics of non lethal post-operative complications in accord with Child Pugh classification.

	Treated (n.)	Complications (%)	Timing	Characteristics
Child A	20	1 (5 %)	1st week	Bacterial cellulitis
Child B	10	2 (20%)	1st week	Abdominal wall haematoma (n. 1)
				Ascitis (n. 1)
Child C	10	7 (70%)	5-15 days	Refractory ascitis (n. 2)
				Spontaneous bacterial peritonitis (n. 2)
				Urinary infection (n. 2)
				Abdominal wall haematoma (n. 1)

less operative time and lower duration of hospital stay in cirrhotic patients, when compared to open cholecystectomy.

As refers to Child C cases treated by LC we observed a slightly higher mortality but a relevant higher impact of non lethal complications. The small number of published cases of Child C cirrhotics submitted to LC does not allow to draw a definitive conclusion about the safety of this approach in such cases[17].

Nevertheless, the pre-operative correction of coagulative disorders along with the intraoperative use of effective haemostatic techniques seems to be imperative. Our experience suggests that the majority of the adverse events among Child C patients occurred when coagulation parameters were severely altered. Also, in Child C cases, we observed a remarkable risk of infective complications with special reference to spontaneous bacterial peritonitis. A correct antibiotic prophylaxis should be promptly adopted to reduce such a risk.

Further prospective studies are deserved to establish whether LC in advanced cirrhosis is an appropriate surgical approach and which factors may affect the outcome.

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