Acute cholecystitis: when is the best time for laparoscopic cholecystectomy?

Ann. Ital. Chir., 2008; 79: 23-27

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Acute colecystitis: when is the best time for laparoscopic cholecystectomy?

Laparoscopic cholecystectomy is no more an elective procedure. The question is when to perform laparoscopic cholecystectomy in the face of acute cholecystitis. The last decade (1995-2004) 297 patients had a laparoscopic cholecystectomy for acute cholecystitis.One hyndred forty six of them were operated in the first 24-48h after the onset of symptoms (group I), 68 were operated in less than 4 weeks time after the attack of the acute cholecystitis (group II), while the rest 83 patients had a history of acute cholecystitis at least four weeks before their elective laparoscopic cholecystectomy (group III). Analysis of the operative time, complications and hospital stay showed that laparoscopic cholecystectomy in acute cholecystitis is the recommended surgical procedure. The success of the operation depends on the degree of the inflammatory changes in the gallbladder and the expertise of the operator both in emergency and laparoscopic surgery. Timing of the operation is crucial to executing a successful procedure. The operation is easier, faster and safer when performed in first 4-5 days of the onset of symptoms.

KEY WORDS: Acute cholecystitis, Laparoscopic cholecystectomy.

Introduction

In the first years of application of the laparoscopic cholecystectomy, acute cholecystitis was considered as a contraindication [1,3,15]. As experience in laparoscopic surgery is increased and with the improvement of laparoscopic equipments, in the first years of 90's more and more patient with acute cholecystitis underwent laparoscopic treatment [16]. The morbidity, the mean hospital stay and the time to return to the previous activities have all been lower in patients undergoing Laparoscopic cholecystectomy than in those undergoing open cholecystectomy in prospective, randomized trials [2,4,9]. The excellent results justify the pioneer surgeons and the patients with acute cholecystitis enjoy all the advantages of this procedure. It was observed that this kind of operation presents different degrees of difficulty in various cases [10,11,16]. The eloquent question is: "Which is the best time of performing more safely and effectively laparoscopic cholecystectomy during the progress of the disease?"

Patients and methods

PATIENTS

During the last decade (1995-2004), 297 patients (males: 126, females: 171, mean age: 61,3years) underwent laparoscopic cholecystectomy for acute cholecystitis. 146 patients (group I) were operated 24-48h after the onset of symptoms. These patients presented pain and tenderness in the right upper quadrant, fever and leukocytosis. Ultrasound scans of the gallbladder showed presence of gallstones, thickened wall of gallbladder and pericholecystic fluid. 68 patients (group II) were operated during a period 4 weeks after the onset of symptoms and of course after the first 48 hours. From those 34 were operated during the first week after having undergone ERCP suspected for choledocholithiasis. 19 patients who were either admitted through other hospitals or were referred to our surgical service during hospitalization in other units, with the diagnosis of acute cholecystitis developed

Pervenuto in Redazione Giugno 2005. Accettato per la pubblicazione Novembre 2006.
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TABLE I

	Group I		Group II				Group III
	<24h	24-48h	48h-7d	2nd week	3rd week	4th week	5th-8th week
patients	91	65	34	19	11	4	83
	146		68				

deteriorization of their condition during the second week and underwent emergency laparoscopic cholecystectomy. From them, 9 patients demonstrated empyema, 6 gangrenous cholecystitis and the rest 4 patients severe inflammatory changes of acute cholecystitis. Finally 11 patients of the group II waiting for scheduled operation, were operated during the 3rd week because of relapsing of their symptoms. The remaining 4 wishing to avoid the risk of a new relapse was operated during the 4th week. The rest 83 patients (group III) were operated 5-8 weeks after the appearance of the initial symptoms in a scheduled delayed operation.

METHOD-TECHNIQUE

Laparoscopic cholecystectomy is started in the usual manner described by Reddick and Olsen. After the control of the abdominal cavity the severeness of the inflammatory changes of the gallbladder is estimated. The separation of the omentum from the wall of gallbladder has different degree of difficulty in direct relation with the operation time. Often it becomes necessary to use a long needle to decompress the gallbladder for getting its capture and manipulation possible.
In case of severe inflammatory changes and great thickness of the wall of gallbladder its capture is made not with the usual graspers but with the extractor grasper. The exposing of the triangle of Calot is made with special attention and with every precaution taken for a difficult cholecystectomy. The cystic duct and cystic artery are always isolated and ligated separately with application of the usual clips. No other ligature is used for the ligation of the cystic duct.
Then the gallbladder is removed from the liver bed using either a monopolar electrocautery or a dissector and scissors. Occasionally for better hemostasis, haemostatic gauze is used. The gallbladder is removed from the abdomen through the umbilical trocar site and in many cases a plastic bag is used. Due to the size of the inflamed gallbladder it is often necessary the enlargement of the incision. Our policy to laparoscopic cholecystectomy for acute cholecystitis is to use always a drainage catheter through the right quadrant trocar site (5 mm) for 24h.

Results

Except 27 (9.1%) patients all the other had a successful laparoscopic cholecystectomy. In 27 patients the laparoscopic procedure converted to open cholecystectomy, 5 from group I (3.4%), 16 from group II (23.5%) and 6 from group III (7.2%).
The 5 patients from group I suffered from severe gangrenous cholecystitis and we faced an enormous difficulty trying to separate the omentum. From the group II, 7 patients who underwent to operation in the first two weeks had severe gangrenous cholecystitis we faced an enormous difficulty trying to separate the omentum and the gallbladder from the liverbed. At the rest 15 patients from group II (9 patients) and group III (6 patients) who underwent to operation between 3rd-8th week, we faced a great difficulty approaching the area due to the existence of solid adhesions and suspicious of incidental injury of the bowel and the biliary tract.

OPERATIVE TIME

In the Ist group the average operative time was 55 min (40-90). In IInd group it was 90 min (65-120) due to the greater difficulties we faced, because of the severe inflammatory state and the development of solid adhesions, especially after the first two weeks. Finally in the IIIrd group the average time was 70 min (50-100).

TABLE II

	Group I (146)	Group II (68)	Group III (83)	S
Laparoscopic cholecystectomy	141	52	77	270
Conversion to open	5	16	6	27
Conversion rate	3,4%	23,5%	7,2%	9,1

TABLE III

Postoperative Complications	**Group I (146)**	**Group II (68)**	**Group III (83)**	**S (297)**
Hemorrhage	2 (1,37%)	5 (7,35%)	2 (2,4%)	9 (3%)
Bile leakage	1 (0,68%)	3 (4,4%)	2 (2,4%)	6 (2%)
Local complications	-	2 (2,9%)	-	2 (0,67%)
Major bile duct injury	-	-	1(0,33%)	1 (0,33%)
Complication rate	3 (2,1%)	10 (14,7%)	5 (6%)	18 (6,06%)

COMPLICATIONS

There were no serious complications or death in any of the three groups. Postoperative hemorrhage from drain was observed at 9 (3%) patients (group I: 2, group II: 5 and group III: 2) and bile leak was observed at 6 (2%) patients (group I:1, group II:3 and group III:2). One patient presented suppuration of umbilical incision and another with an acute abdominal pain lasting three days, both of them of group II. All the previous complications had successful non-operative treatment.

Major bile duct injury was observed at one patient (0.33%) from group III and after ERCP procedure, underwent to operative treatment.

HOSPITAL STAY

The postoperative hospital stay was 2 days (18h-6d) for the group I, 75 days (3d-12d) for the group II and finally 2.5 days (1d-12d) for the group III.

Our mortality rate was 0% and postoperative morbidity rate was 6.1%.

Discussion

Initially the management of the acute cholecystitis was conservative with a delay of 6-12 weeks for the planning of the operation. Nevertheless there were cases in which the failure of the conservative treatment led to an emergency operation. In the 70ies and 80ies after comparative and prospective studies and the discussion that followed, early surgery for acute cholecystitis became the treatment of choice.[7-9,12-14] As laparoscopic cholecystectomy became available, acute cholecystitis considered to be contraindication.1,[3,9,14,15] In the early 90ies the acquisition of experience and the technological development as well as the results of comparative studies on the complications, the operative time and the hospital stay made the laparoscopic procedure available also to patients with acute cholecystitis [2-4,7,9,14-16]. The questions to be addressed are "which is the best time of performing the laparoscopic procedure in case of acute cholecystitis" and "if timing coincides with the open technique".

Based on the international literature and on our results we came to conclusion that laparoscopic cholecystectomy, in the early 48 hours from the onset of the symptoms of acute cholecystitis, is usually an easy, safe and rapid procedure and in the most cases easier and safest even than the open one [2,9]. The laparoscopic procedure even stays safe and easy, like open one, at the first 5-7 days from the onset of symptoms [10,11]. The careful clinical and laboratory evaluation of the patients preoperatively and the advantages that offered from the ERCP have made the intraoperative cholangiography rarely involved [6,8]. 7 out of the 34 patients who underwent ERCP and in whom gallstones were found in the choledochus duct and removed, were treated laparoscopically soon after with success.

We faced greater difficulties with the patients of group II, who presented a deteriorization of the initial symptoms of acute cholecystitis, arriving to operating room on emergency basis, usually the second week after the onset of the symptoms. This is not particularly strange considering the fact that the initial chemical inflammation of the gallbladder becomes also bactericidal usually after the second week. Operating these patients was more difficult and more technical modifications of the standard procedure were necessary.

The experience and skill management of the surgeon in emergency and laparoscopic surgery in these cases is a former condition [2,10,11].

Although most of those patients didn't loose the advantages of the laparoscopic technique, it is obvious that an early cholecystectomy during the initial edematosus phase of the gallbladder would be easier and more pleasant for both, the patients and the surgeons.[2,4,7] The patients of the group III had a different degree of difficulty depend on the chronicity of their symptoms and the chronic inflammation of the gallbladder and liverbed. Therefore the technical difficulty of the operation was related to the existence or not of solid adhesion and the excistence of a wrinkled gallbladder.

From the comparison between our results (from patients who underwent to laparoscopic cholecystectomy for acute cholecystitis) and the results from international literature for patients who underwent to laparoscopic

TABLE IV

Author	Patients	Etiology	Mortality(%)	Morbidity(%)	Duct injury	Bile leak	Bleeding
Deziel et al	77604	Uncomplicated Gallstone disease	0,04	2.0	0.6	0.3	0.5
Deveney	9597	Uncomplicated Gallstone disease	0,04	2.5	0.3	0.7	0.5
Orlando et al	4640	Uncomplicated Gallstone disease	0.13	8.6	0.3	-	-
Larson et al	1983	Uncomplicated Gallstone disease	0.1	2.1	0.3	0.4	0.4
SAGES	2671	Uncomplicated Gallstone disease	0.15	-	0.2	1.0	0,6
Cuschieri et al	1236	Uncomplicated Gallstone disease	0.0	1.6	0.3	0.2	0.9
Kimura et al	1989	Uncomplicated Gallstone disease	0.0	1.8	0.6	0.8	0.2
Our results			0.0	6.1	0.33	2.0	3,0
Our results from the first 7 days	297	Acute cholecystitis	0.0	2,35	0.0	0.6	1.68

cholecystectomy for uncomplicated gallstone disease, we conclude that the laparoscopic procedure is very safe in the first 7days. After that period (>7days), we observed an increased morbidity rate because of greater difficulties with the operative management of these patients.[2,5,10,11]

Conclusions

Laparoscopic cholecystectomy is the first choice procedure for the operative treatment of acute cholecystitis. The success of this approach depends on the expertise of the operator both in the classical open and emergency surgery and the laparoscopic one. The grade of the inflammatory changes of the gallbladder determines the grade of difficulty of the operation. Therefore, the timing of the operation is crucial [2,4].

Finally it seems that the same rules value for both open and laparoscopic cholecystectomy. The operation is easier in the early edema phase of acute inflammation within the first 48 hours from the onset of the symptoms becoming difficult later (after the first week) and especially when they have relapsing of the symptoms [1,7].

The convertion to an open procedure becomes more and more rare with the acquisition of experience, but we must always keep in mind the basic rule: Convertion to an open procedure should not be considerated a failure but rather a good judgment.

Riassunto

La colecistectomia laparoscopica non è più un trattamento solo d'elezione. In tutti i casi di colecistite acuta, infatti, la questione importante che emerge sempre più è quanto ed in vista di quali indicazioni-presupposti, va eseguito ai giorni d'oggi detto intervento. Nell'ultimo decennio (1995-2004) nel nostro reparto 297 pazienti sono stati sottoposti ad intervento di colecistectomia laparoscopica poiché affetti da colecistite acuta. Di questi, 146 sono stati operati entro le prime 24-48 ore dall'esordio della sintomatologia (gruppo I), 68 sono stati operati dopo meno di 4 settimane dall'insorgenza della colecistite acuta (gruppo II), mentre i rimanenti 83 pazienti hanno manifestato il quadro clinico compatibile ad una colecistite acuta per un periodo almeno uguale o superiore a quattro settimane prima di essere sottoposti ad intervento elettivo di colecistectomia laparoscopica (gruppo III).

Dall'analisi del tempo medio di durata d'intervento, delle complicazioni intra- e postoperatorie e del periodo medio richiesto di ricovero ospedaliero, risulta che la colecistectomia laparoscopica è la procedura chirurgica più indicata al trattamento della colecistite acuta. Il successo dell'intervento però, dipende in massima parte dal grado di alterazione indotta sulla colecisti per causa del processo infiamatorio, a livello anatomico e funzionale,

dalla gravità del processo infiammatorio di per sè, ma anche dall'esperienza del Chirurgo nel saper intervenire, usando la tecnica laparoscopica nella colecistite acuta, sia in situazioni programmate che - e sopratutto - in quelle d'urgenza. La scelta corretta del momento più opportuno per l'esecuzione dell'intervento, risulta di cruciale importanza. In conclusione, possiamo affermare che l'intervento risulta più semplice, rapido da eseguire ed esente di complicanze, se realizzato entro i primi 4-5 giorni dall'insorgenza della sintomatologia tipica del quadro clinico in questione.

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