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Laparoscopic Cholecystectomy for Acute Cholecystitis: Is It Really Safe?

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Abstract. The prospectively collected data from 530 cholecystectomies performed in a university clinic from October 1989 to March 1991 were analyzed after 1 to 3 years of follow-up. The aim of this study was to compare the results of laparoscopic cholecystectomy (LC) for acute cholecystitis with that for routine symptomatic gallbladders. The preoperative, intraoperative, and postoperative parameters of 424 routine (noninflamed) LCs and 54 LCs for acutely inflamed gallbladders were compared under the "intention to treat" principle. Operating time was longer in the inflamed group (median 97 minutes versus 75 minutes; $p < 0.0001$). Significantly more adhesions (20% versus 8%), more blood loss (48% versus 19%), a higher incidence of bile spillage (28% versus 12%), and lost stones (19% versus 8%) were encountered in patients with acute cholecystitis. Common bile duct (CBD) injuries were also more frequent in that group (5.5% versus 0.2%; $p = 0.005$). The rate of conversion to open surgery was higher than with routine LCs (13% versus 4%). There were two deaths in the routine LC group and none in the acutely inflamed group. There was no difference in postoperative pain intensity or postoperative fatigue according to visual analog scale measurements. Patients with acute cholecystitis stayed only 1 day longer (median 4 days versus 3 days) in hospital. The quality of life scores indicate return to almost normal values by the 14th postoperative day. Long-term follow-up (1–3 years) did not reveal any delayed clinical adverse effects. In summary, LC for inflamed gallbladders has a higher conversion rate than LC for routine symptomatic gallbladders. If successfully performed, it has definite benefit for the patient in terms of better postoperative recovery. The trade-off is that the risk of CBD injury is significantly higher.

Laparoscopic cholecystectomy (LC) is the present procedure of choice for symptomatic cholelithiasis without evidence of inflammation. The incidence of major bile duct injury with LC is probably approaching that associated with conventional surgery as more experience is gained [1]. Also recognition of the need for structured training and accreditation has prevented, to some extent, improperly trained surgeons from performing unsupervised laparoscopic surgery [2].

There are still limitations inherent in the two-dimensional view and lack of tactile sensation during laparoscopic surgery. These disadvantages are amplified in the presence of acute inflammation. In fact, until recently acute inflammation was a contraindication for laparoscopic cholecystectomy [3]. However, with growth in experience and confidence, more and more surgeons are attempting to treat inflamed gallbladders laparoscopically and have reported the procedure to be safe [4–16]. Only one study reported a higher incidence of bile duct injury [17]. The aim of this study is to analyze the safety and efficacy of LC for acute cholecystitis in comparison with LC for routine (noninflamed) cholelithiasis in a consecutive series of patients.

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Methods

The first LC performed in our university clinic was done in October 1989. Acute cholecystitis was a contraindication in the first approximately 100 cases. Thereafter with more experience LC was attempted even for acutely inflamed gallbladders. The data from 530 consecutive cases of LC performed between October 1989 and March 1991 were reviewed after 1 to 3 years of follow-up. All data have been prospectively collected using a detailed protocol containing about 1300 parameters. Preoperative data collected included the patient's sociodemographic data, American Society of Anesthesiology (ASA) classification, and associated co-morbidity factors. Intraoperative data collected included operation duration (from incision to last stitch); adhesions encountered around the gallbladder; complications encountered, such as gallbladder perforation, stone spillage, stone loss, bile duct injuries, and vascular injuries; estimated blood loss that is more than expected (> 10 ml); and conversion to open surgery. These factors are important regarding the *safety and feasibility* of the procedure.

Postoperatively, severity of pain was documented by daily pain scoring using a visual analog scale (VAS: 0 = no pain to 100 = intolerable pain) for 3 days and by noting the type of analgesia given to the patient. Postoperative recovery was assessed by the number of days before the patient could resume fluid and normal diet intake and could mobilize. In addition, postoperative fatigue on the first postoperative day was estimated with a VAS (1 = fitness; 4 = mild tiredness; 7 = tiredness; 10 = exhaustion). These factors determined the *comfort of the patient*.

Quality of life was measured in this cohort with the Gastrointestinal Quality of Life Index (GQLI), which has been previously validated [18]. The dimensions assessed were physical functions, social functions, symptoms, and emotions. Patients were given the GQLI questionnaire forms before the operation, on the 14th postoperative day, 6 weeks after operation, and 6 months later. To

Table 1. Preoperative status.

Factor	Acute cholecystitis (n = 54)	Routine LC (n = 424)	p
Age (years), median and range	55 (18–84)	50 (17–87)	0.016[a]
Sex (M:F)	0.7:1.0	0.3:1.0	0.003[b]
Weight (kg), median and range	75 (49–110)	72 (40–128)	NS
ASA[c]			
I	17 (31%)	140 (33%)	NS
II	27 (50%)	250 (59%)	
III	9 (17%)	30 (7%)	
IV	1 (2%)	4 (1%)	
Co-morbidity factors			
Lung disease	5 (9%)	57 (13%)	NS
Cardiovascular disease	12 (22%)	42 (10%)	0.014[b]
Diabetes	5 (9%)	20 (5%)	NS
Obesity	33 (61%)	286 (67%)	NS
Cirrhosis	0	9 (2%)	NS
Smoking	12 (20%)	94 (22%)	NS
Previous major abdominal surgery[d]	2 (4%)	4 (1%)	NS
Preop. stay (days), median and range	2 (1–16)	1 (0–31)	NS

[a]Mann-Whitney U test.
[b]Chi-square test.
[c]American Society of Anesthesiologists (ASA) classification.
[d]Includes all intrabdominal operations except the standard appendectomy.

Table 2. Intraoperative findings.

Factor	Acute cholecystitis (n = 54)	Routine LC (n = 424)	p
Operating time[a] (minutes), median and range	97 (35–195)	75 (20–260)	< 0.0001[b]
Adhesions	12 (20%)	36 (8%)	0.004[c]
Intraop. cholangiogram	9 (17%)	12 (3%)	< 0.0001[c]
Gallbladder perforation	34 (63%)	113 (27%)	< 0.0001[c]
Stone spillage	15 (28%)	51 (12%)	0.003[c]
Stone lost	10 (19%)	32 (8%)	0.015[c]
Blood loss >10 ml[d]	27 (50%)	81 (19%)	< 0.0001[c]
Drainage	3 (6%)	20 (5%)	NS
Wound extension	32 (59%)	156 (37%)	0.002[c]

[a]From incision to last stitch.
[b]Mann-Whitney U test.
[c]Chi-square test.
[d]As estimated by the surgeon.

determine the long-term results, the cohort of patients were recalled to the clinic for a final interview and assessment of life quality between January and August 1993. In this way, follow-up of 1 to 3 years was achieved for more than 90% of patients, of whom 78% completed the GQLI questionnaires.

Patients

The definition of acute cholecystitis was based on the clinical presentation (right hypochondrial tenderness, fever, leukocytosis), ultrasound findings of a thickened gallbladder wall, and the surgeons' finding evidence of acute inflammation at the time of operation. Of the 530 patients in the database, 478 (90.2%) were analyzed. There were 424 (88.7%) routine (noninflamed) LCs and 54 (11.3%) LCs for acute cholecystitis. Both groups were analyzed under the "intention to treat" principle. Forty-eight (9.1%) cases were excluded from the analysis because of incomplete data, and four (0.8%) were open cholecystectomies.

Technique

Cholecystectomy for acute cholecystitis was performed during the same admission. The details of the LC technique in this clinic have been reported elsewhere [19]. In brief, LC was performed with the French technique using a one-chip camera and a 30-degree laparoscope. Dissection was by means of a hook dissector or a pair of hook scissors aided by monopolar electrocautery. Intraoperative cholangiography (IOC) was performed selectively. Preoperative endoscopic retrograde cholangiography (ERC) is the method of choice for detecting and managing suspected common bile duct (CBD) stones in this clinic. IOC was done when the anatomy was uncertain or when duct injury was suspected. All patients received heparin prophylaxis against thromboembolism. Antibiotics were given to patients diagnosed as having acute cholecystitis but not to those for routine LC. Drains were placed only when absolutely necessary.

Statistics

Numerical data were compared using the Mann-Whitney U test and categorical data with either the chi-square test or the Fishers' exact test when appropriate. A p value less than 0.05 was considered significant.

Results

Preoperative Status

The patients who presented with inflamed gallbladders were slightly older, and the proportion of men was higher than among those with noninflamed gallbladders. (Table 1). There was no difference in the preoperative state in terms of ASA classification, although there was a significantly higher incidence of cardiovascular diseases in the inflamed gallbladder group. There was no difference in the incidence of previous major abdominal operations. Preoperative stay was also similar for the two groups.

Intraoperative Findings

Operating time was longer in the inflamed gallbladder group (Table 2). More adhesions were found surrounding the gallbladder and more IOCs were performed in the acutely inflamed group. There was a higher incidence of perforation from handling of inflamed gallbladders, with resultant stone spillage and stone loss. Half of the patients with acute cholecystitis had more than the usual estimated 10 ml of blood loss. The drainage rate was similar. More than half of the wounds had to be extended to extract the inflamed gallbladders.

Outcome

Safety and Feasibility

1. *Common bile duct injury*. There were three (5.5%) CBD injuries in the inflamed group (Table 3). The CBD of one patient with acute cholecystitis was mistakenly dissected as the cystic duct. When the mistake was realized, there were already two holes in the CBD. Conversion to open operation with T-tube drainage was done. In two other patients with acute cholecystitis the CBD was transected. In one patient it was cut across about 1 cm below the cystic duct. The injury was discovered at the time of operation. Duct-to-duct anastomosis was performed over a T-tube. The other patient developed postoperative jaundice and was reoperated on the fourth postoperative day. A segment of the CBD about 2 cm in length was found to have been excised. Hepaticojejunostomy was performed. In one patient (0.2%) with a noninflamed gallbladder the CBD was damaged by the cautery hook. Conversion to open operation with T-tube drainage was performed. Up to now, these patients remain clinically asymptomatic.

2. *Bile leak*. One patient developed signs of bile peritonitis postoperatively after LC for a noninflamed gallbladder. Laparotomy revealed no obvious source of the leak. The patient died from a myocardial infarct after the laparotomy.

3. *Vascular injury*. In one patient with acute cholecystitis the right hepatic artery was injured during dissection, and the operation was converted to open surgery. In the routine LC group, there was a trocar-related left common iliac artery injury that was repaired with no further consequence. Another patient with cavernous transformation of the portal vein from previous portal vein thrombosis developed massive hemorrhage during dissection, and the operation was converted to open surgery. She required another operation on the seventh day because of CBD stenosis, for which stents were placed via the papilla through a duodenostomy. Postoperatively, she developed pulmonary sepsis, septic endocarditis, and renal failure. The patient died 7 months later.

4. *Conversion*. Seven patients (13%) with acute cholecystitis required conversion to open surgery. Unclear anatomy (four patients), CBD damage (two patients), and uncontrollable bleeding (one patient) were the reasons for conversion in the inflamed gallbladder group. In the routine LC group, the conversion rate was 4%. Unclear anatomy (five patients) and bleeding (four patients) were the main reasons for conversion. Conversion was also effected in one case each for the following reasons: partial CBD injury, suspected right hepatic duct injury, CBD stones, adhesions from previous surgery, gallbladder cancer, and instrument problem.

5. *Mortality*. There were two postoperative deaths in the routine LC group, as described above. No deaths occurred in the inflamed gallbladder group.

Benefit for the Patient

1. *Pain*. There was no difference in pain intensity up to the third postoperative day according to the VAS (Table 3). However, more patients in the inflamed gallbladder group required parenteral opiate analgesia.

2. *Postoperative recovery*. Most patients in both groups were able to mobilize on the day of operation, drink on the first postoperative day, and consume a normal meal on the second postoperative day. Postoperative fatigue as assessed by the VAS was also similar. Patients with acute gallbladders stayed 1 day longer than those in the routine LC group.

Table 3. Outcome of LC for acute cholecystitis.

Parameter	Acute cholecystitis (n = 54)	Routine LC (n = 424)	p
CBD injuries	3 (5.5%)	1 (0.2%)	0.005[a]
CBD damage	1 (1.8%)	1 (0.2%)	
CBD transection	2 (3.7%)	0	
Bile leak	0	1 (0.2%)	NS
Vascular injuries	1 (1.8%)	2 (0.4%)	NS
Conversion	7 (13%)	16 (4%)	0.008[b]
Mortality	0	2 (0.7%)	NS
Pain intensity[a,c]			
Op. day	38 (0–100)	35 (0–100)	NS
Postop day 1	26 (0–80)	30 (0–100)	NS
Postop day 2	22 (0–100)	20 (0–100)	NS
Postop day 3	10 (0–62)	10 (0–100)	NS
Op. day analgesia			
None	12 (22%)	83 (20%)	0.011[b]
Oral NSAID[d]	16 (30%)	212 (50%)	
IM/IV opiate[e]	26 (48%)	129 (30%)	
Fluid intake (days)[c]	1 (0–3)	1 (0–3)	NS
Diet (days)[c]	2 (1–6)	2 (1–5)	NS
Mobilization (days)[c]	0 (0–5)	0 (0–3)	0.048[g]
Postop. stay (days)[c]	4 (1–31)	3 (1–48)	< 0.0001[g]
Fatigue[c,f]	4 (1–10)	4 (1–10)	NS

[a]Measured with the visual analog scale (0: no pain; 100: intolerable pain).
[b]Chi-square test.
[c]Median values (range).
[d]Oral nonsteroidal antiinflammatory drugs requested by patients for mild to moderate pain.
[e]Intramuscular or intravenous opiates given for severe pain.
[f]Measured with the visual analog scale (1: fitness; 4: mild tiredness; 7: tiredness; 10: exhaustion).
[g]Mann-Whitney U test.

3. *Quality of life*. The quality of life scores (global and individual scores of the respective dimensions) showed no difference in the two groups, with a return to almost normal values (121–126) by the 14th day (Fig. 1).

4. *Long-term follow-up*. There was no clinical evidence of any delayed adverse effects, such as biliary strictures, for up to 3 years of follow-up.

Discussion

Acute cholecystitis accounts for about 20% of patients requiring cholecystectomy. LC for acutely inflamed gallbladders is difficult and entails a significantly longer operation time owing to the frequent presence of adhesions around the gallbladder, edematous tissues obscuring the anatomy in Calot's triangle, and friable gallbladders that are commonly torn during retraction. Time and

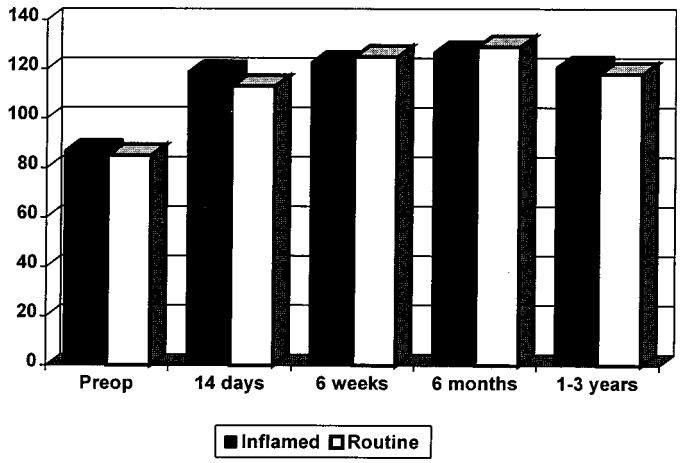

Fig. 1. Quality of life after laparoscopic cholecystectomy, as measured with the Gastrointestinal Quality of Life Index (GQLI). Physical functions, social functions, symptoms, and emotions were the dimensions assessed. Normal individuals have a score of 121 to 126.

energy are wasted in retrieving spilled stones; often small stones are lost in the peritoneal cavity. Additional tribulations to the surgeon include bleeding from adhesions and from the gallbladder bed. Not surprisingly, the conversion rate is significantly higher than that for noninflamed gallbladders. If the surgeon succeeds in performing the cholecystectomy laparoscopically, the final battle that the by now physically and mentally tired surgeon has to fight is to remove the gallbladder through a "minimally invasive" incision. Rupture of the gallbladder and stone spillage can still occur at this stage. More than half of the wounds had to be extended in this series.

The rate of bile duct injury for the whole of this series was 0.8% (4 of 478). This figure is higher than that reported for open cholecystectomy (0–0.25%) but within the range published for LC (0–2%) [20]. On further analysis, the injuries are seen to have occurred disproportionately more frequently in patients with acutely inflamed gallbladders (5.5% versus 0.2%). Acute inflammation was one of the few contraindications for LC in the early days of the development of this procedure [3]. It was also a contraindication during the first few months in this clinic. With the increased experience after about 100 cases, this clinic, as with many other "pioneer" centers, began attempting LC in patients with acute inflammation. However, within a short span of a couple of years, LC for gallbladders with acute inflammation was reported in the literature to be safe [4–16]—in contradiction to conventional wisdom. Even at open surgery acute inflammation was associated with higher morbidity and mortality. Is it really safe? If not, why is it not reflected in the published literature.

There are five possible explanations for the discrepancy. First, there may be a selection bias for patients undergoing LC. It is conceivable that some patients with symptoms of severe inflammation were selected directly for open surgery, either by the surgeon or by the referring source (preoperative selection bias). This selection bias probably occurred in series where acute cholecystitis accounted for fewer than 10% of the total cases of LC (Table 4).

Second, severe inflammation in the form of gangrenous cholecystitis and empyema were the cases that usually were converted to open surgery. Thus LC were performed for the less severely inflamed gallbladders in most of the cases reported (intraoperative selection bias). This factor also accounts for the observation that short preoperative delay enhances the chance of success by the laparoscopic approach [12].

Third, the number of cases reported were simply too few, and most were performed by experienced surgeons with keen interests in laparoscopic surgery (small sample size and operator bias). Fourth, although publications on LC for acute cholecystitis reported few CBD injuries, those that focused on such injuries did include some cases with acute inflammation (publication bias) [21, 22].

Finally, the diagnosis of acute cholecystitis was based on different criteria in different series (inhomogeneous samples) (Table 4). This factor may explain the wide variation in conversion rates (1.5–35.0%) reported. The criteria include clinical signs of tenderness in the right hypochondrium, fever, and leukocytosis; ultrasound finding of a thickened gallbladder wall ($>$ 3 mm); intraoperative findings of an edematous, distended gallbladder; and pathologic evidence of acute inflammation. Discordance between intraoperative findings and pathology, however, has been reported to be as high as 39% [23]. Future studies on acute cholecystitis should still include pathology but with more weight on clinical signs and intraoperative findings.

Bearing in mind the multiple biases and the small, inhomogeneous numbers of cases in reported series of LC for acute cholecystitis, it is probably too early to proclaim it a safe procedure. It is our responsibility as endoscopic surgeons to critically evaluate the feasibility of LC for acute inflammation. The initial flood of CBD injuries attributable to LC during the first 2 years of its development was the result of uncontrolled dissemination from the "experts" to the general surgeon population. The mistake must not be repeated for acute cholecystitis.

Successful completion of cholecystectomy for inflamed gallbladder has a definite benefit for the patient. Postoperative pain, fatigue, and recovery results are practically as good as those for routine LC and are better than those for open cholecystectomy done for acute cholecystitis [13, 17]. It is thus not fair to consider an inflamed gallbladder an absolute contraindication because about 75% of such patients benefit from the LC. On the other hand, there is a trade-off because the risk of CBD injury is higher. Is it worthwhile to risk a major life-threatening injury in order to have short-term benefits (usually less than 6 weeks) of better postoperative recovery? This question is relevant to all laparoscopic procedures and any new medical technology.

The most reasonable approach for acute cholecystitis is to perform a diagnostic laparoscopy in all cases of acute cholecystitis. Within 10 to 15 minutes, the feasibility of completing the procedure laparoscopically is apparent. If it is not feasible, conversion to open surgery should be effected without undue delay. If the laparoscopic route is chosen, the following principles must be strictly adhered to in order to avoid CBD injury: (1) performance or close supervision by a surgeon with extensive experience performing both open cholecystectomy and LC; (2) use of a 30-degree laparoscope [24]; (3) availability of a clear, high-resolution image on the monitor; (4) retraction of the neck of the gallbladder laterally to open Calot's triangle [20]; (5) dissection starting from the gallbladder neck toward the CBD; (6) unambiguous identification of the cystic duct–gallbladder junction (it is unnecessary to fully dissect the cystic duct–CBD junction); (7)

Table 4. Literature survey of publications on LC for acute cholecystitis.

Study	No.	Percent of series	Definition of acute cholecystitis	IOC policy	Conversion (%)	CBD injury (%)
Jacobs [4]	79				6/30[a]	0
Flowers [5]	15	6	Clinical + intraop. findings	Routine	33	0
Reddick [6]	11	3	Not stated	Routine	9	0
Phillips [7]	25	7	Clinical findings only	Routine	4	0
Fletcher [8]	10	12	Clinical + intraop. findings	Routine	30	0
O'Rourke [9]	68	Not stated	Includes pathology	Selective	1.5	0
Wilson [10]	31	9	Clinical + intraop. findings	Selective	6	0
Unger [11]	100	26	Includes pathology	Routine	8	0
Rattner [12]	20	7	Includes pathology	None performed	35	0
Cox [13]	98	23	Clinical + intraop. findings	Routine	34	0.1
Zucker [14]	83	12	Clinical only	Routine	27	0
Miller [15]	29	26	Includes pathology	Selective	14	0
Singer [16]	68	15	Includes pathology	Not stated	14/35[a]	0
Kum [17]	66	23	Includes pathology	Selective	30	1.5
Present series	54	11	Clinical + intraop. findings	Selective	13	5.5

[a]The authors had classified the acute cholecystitis cases into mild and severely inflamed, gangrenous groups. Different conversion rates were reported for each group.

IOC: intraoperative cholangiogram; CBD: common bile duct.

minimum use of electrocautery in Calot's triangle [22]; and (8) liberal use of IOC to confirm the anatomy. IOC does not prevent duct injuries completely [25, 26], but it has prevented duct transections in some cases and allowed detection of duct injuries intraoperatively [24]. Primary repair of CBD injuries is associated with a better prognosis than delayed repair. Nonetheless, the results of repair or bypass after CBD injury are often poor. It is incumbent on all surgeons performing cholecystectomy to learn how to avoid this disastrous complication altogether [27].

A low threshold for conversion must be maintained. Conversion to open surgery is done if the anatomy cannot be determined after an adequate period of dissection (15–30 minutes), when there is unexplained bile leak or hemorrhage or when the IOC is abnormal. Conversion should not be considered a failure but, rather, a positive step toward safer surgery.

Certainly, more data are needed before LC can be considered safe for acute cholecystitis. Costs should also be analyzed in view of its high conversion rate and prolonged operation time. Rapid postoperative recovery is the most important advantage, which may offset the economic costs provided major complications are avoided. At present, LC for acute cholecystitis is anything but safe in the hands of the inexperienced surgeon.

Résumé

On a prospectivement recueilli des données chez 530 patients opérés de cholécystectomie dans une clinique universitaire entre Octobre 1989 et Mars 1991. Les résultats ont été analysés un et trois ans après l'intervention. Le but ce cette étude a été de comparer les résultats de la cholécystectomie laparoscopique (CL) pour cholécystite à ceux de la cholécystectomie pour vésicule symptomatique sans cholécystite. Les paramètres pré, per et postopératoires chez 424 patients ayant eu une CL pour vésicule non-inflammatoire ont été comparés aux 54 patients opérés pour une cholécystite sous le principe d' «intention do traiter». La durée de l'intervention a été plus longue dans le deuxième groupe (cholécystite) (durée médiane: 97 vs 75 minutes; $p < 0.0001$). Il y avait statistiquement plus de patients avec adhérences (20% vs 8%), pertes sanguines (48% vs 19%), avec épanchement biliaire peropératoire (28% vs 12%) et perte de lithiase (19% vs 8%) dans ce même groupe de patients. Les lésions de la voie biliaire principale étaient également plus fréquentes (5.5% vs 0.2%; $p = 0.005$). Le taux de conversion était plus élevée dans ce groupe que dans l'autre (13% vs 4%). Il y avait deux désès dans le groupe sans cholécystite comparés à aucun dans le groupe avec cholécystite. Il n'y avait aucune différence en ce qui concerne l'intensité de la douleur et de la fatigue postopératoires mesurées sur une échelle visuelle analogique. Les patients opérés d'une cholécystite aiguë sont restés seulement un jour de plus (médiane 4 vs 3 jours) à l'hôpital. Les scores de qualité de vie ont indiqué un retour à la normale vers le 14é jour postopératoire. Le suivi à long terme (1-3 ans) n'a pas révélé de complications cliniques. En conclusion, la CL pour cholécystite aiguë est associée à un taux de conversion élevé. Si elle est effectuée avec succès, l'avantage pour le patient est une récupération postopératoire meilleure. Cependant, il y a statistiquement plus de complications au niveau de la voie biliaire.

Resumen

Luego de un seguimiento de uno a tres años, se analizaron los datos recolectados en forma prospectiva sobre 530 pacientes sometidos a colecistectomia en un servicio universitario entre octubre de 1989 y marzo de 1991. El propósito del estudio fue comparar los resultados de las colecistectomias laparoscópicas (CL) por colecistitis aguda con los de CL por enfermedad sintomática rutinaria de la vesícula biliar. Los parámetros preoperatorios, intraoperatorios y postoperatorios de 424 CL rutinarias (vesícula no inflamada) y de 54 de CL por vesículas con inflamación aguda fueron comparados con el principio de "intención de tratamiento." La operación fue de más larga duración en el grupo con inflamación (promedio 97 vs 75 minutos; $p < 0.0001$); significativamente mayor incidencia de adherencias (20% vs 8%), mayor pérdida de sangre (48% vs 19%), mayor frecuencia de escape biliar (28% vs 12%) y mayor pérdida de cálculos en la cavidad peritoneal (19% vs 8%) fueron registrados en los casos de colecistitis aguda. También fueron más frecuentes las lesiones del colédoco (5.5% vs 0.2%; $p = 0.005$). La tasa de conversión a cirugía abierta fue mayor (13% vs 4%). Se presentaron 2 muertes

en el grupo de CL rutinaria y ninguna en el grupo con inflamación. No se encontró diferencia en cuanto a la intensidad del dolor y a la fatiga postoperatorios según las mediciones análogas visuales. Los pacientes con colecistitis aguda permanecieron hospitalizados apenas un día más (promedio 4 vs 3 días). Los puntajes de calidad de vida indican el retorno a valores casi normales hacia el día 14. El seguimiento a largo plazo (1–3 años) no reveló efecto clínico adverso alguno. En resumen la CL para vesículas biliares con inflamación aguda exhibe una más alta tasa de conversión. Si se efectúa exitosamente, es de beneficio para los pacientes en términos de una mejor recuperación postoperatoria. Sin embargo, hay que tener en cuenta que el riesgo de lesión del colédoco es significativamente mayor.

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Invited Commentary

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Laparoscopic cholecystectomy (LC) is an accepted elective surgical procedure for treatment of symptomatic cholelithiasis, although it is not yet considered the method of choice for acute cholecystitis. In fact, during the early years of laparoscopic surgery it was contraindicated in patients with acutely inflamed gallbladders. Thus the paper of Kum et al. is welcome because of their large experience with LC, especially, their analysis on safety and efficiency, comparing the outcome of patients with acute cholecystitis with that of patients with simple cholelithiasis. As expected, the operating time was longer for the inflamed gallbladder group, and there was a higher incidence of perforation of the gallbladder, resulting in stone loss. The major problem has been common bile duct (CBD) injury (5.5% versus 0.2% in the routine LC group).

It is important to point out that when a protocol for LC for acute cholecystitis is established surgeons must be prepared to have a high percentage of conversions to open surgery. The problem is to carry out LC in all cases, even with the risk of serious complications. The evident benefits of LC—reflected in the better postoperative recovery, shorter hospital stay, and good wound cosmetic aspects [1]—do not mean that LC is "obligatory": Open cholecystectomy is a good technique, with little associated morbidity and insignificant mortality. The conversion rate varies among the published series (13% in this study), mainly because the criteria for the diagnosis of acute cholecystitis are not the same. The number of LCs converted is higher for the most

complicated cases, being as high as 75% in patients with gangrenous cholecystitis [2].

Kum et al. wonder if LC is really safe. This question can be answered affirmatively if: (1) The surgical procedure is carried out by an experienced surgeon. (2) Selection of patients is appropriate. (3) It is converted to open cholecystectomy in the presence of serious difficulties: Surgeons must keep in mind that sometimes a technique can be done, but it may be judicious not to perform it. The most advisable policy seems to be approach all cases of acute cholecystitis with the laparoscopic procedure, first with a diagnostic aim; then, after evaluating the endoscopic findings, the surgeon can decide to proceed to LC or to laparotomy, considering his or her own experience and the safety of the patient. Obviously, the time elapsed from the onset of the symptoms and the clinical situation of the patient are important factors [3].

As the authors point out: "Conversion should not be considered a failure; rather, it is a positive step toward safer surgery." That is, it is not a failure for the surgeon but a safety measure for the patient. The high conversion rate to open cholecystectomy should be accepted as indicating good judgment [4].

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