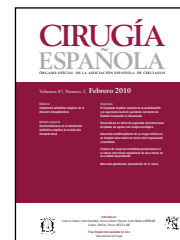


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Original article

Acute cholecystitis: is it still justified to delay surgery?☆

Purificación Calero García,* Jaime Ruiz Tovar, Alfonso Sanjuanbenito Dehesa, Alicia Calero Amaro, María Díez Tabernilla, Raquel Latorre Fragua, Gada Housari Martín, Enrique Martínez Molina, and Virgilio Fresneda Moreno

Departamento de Cirugía General y Digestivo, Hospital Ramón y Cajal, Madrid, España

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Introduction: Acute cholecystitis treatment may initially be surgical or conservative with subsequent surgery; we reviewed the cases found in our centre, including their treatment and outcome.

Material and methods: We conducted a retrospective study of treatment in 178 patients with acute cholecystitis during one year. We evaluated variables associated with patient characteristics, as well as clinical data, diagnostic tests, treatment and outcome.

Results: The majority (70.2%) was treated conservatively (group A), and 29.8% were operated on in the first 72 h (group B). In group A, 96 patients were treated with antibiotics, 15 with antibiotic therapy and cholecystectomy, and 12 with antibiotics and ERCP. In group B urgent laparoscopic cholecystectomy was performed in 60.4%, and 35.8% had open cholecystectomy. In group A, admission time was 11 days, with satisfactory progress in 79.2%, mortality rate of 5.6% and 10.7% of readmissions. In group B, operation time was 111±43 min, a mean of 8.7 days hospital stay, and 68% of cases did not require further treatment after surgery. Outcome was satisfactory in all but 7, there was no mortality in this group. We had a return rate of 2%.

Conclusions: A significant proportion of conservative treatment was carried out at the expense of emergency surgery, although in absolute numbers conservative treatment seems to have a higher rate of complications, mortality and hospitalisation time.

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*Corresponding author.

E-mail address: purikicg@hotmail.com (P. Calero García).

Colecistitis agudas: ¿está justificado hoy en día diferir la cirugía?

R E S U M E N

Palabras clave:

Colecistitis aguda

Cirugía diferida

Tratamiento médico

Introducción: El tratamiento de la colecistitis aguda puede ser inicialmente quirúrgico o conservador con cirugía posterior; revisamos los casos encontrados en nuestro centro, cómo fueron tratados y la evolución de los mismos.

Material y métodos: Realizamos un estudio retrospectivo del tratamiento realizado en 178 pacientes con colecistitis aguda durante un año. Se evalúan variables relacionadas con las características de los pacientes, clínica y exploración, técnicas diagnósticas, tratamiento realizado y evolución.

Resultados: El 70,2% es tratado de forma conservadora (grupo A) y el 29,8% es intervenido en las primeras 72 h (grupo B). En el grupo A se trataron 96 casos con antibioterapia, 15 con antibioterapia y colecistostomía y 12 con antibioterapia y CPRE. En el grupo B se realizó colecistectomía urgente laparoscópica en el 60,4% de los casos y abierta en el 35,8%. En el grupo A el tiempo de ingreso fue de 11 días, con evolución satisfactoria en el 79,2%, tasa de mortalidad del 5,6% y tasa de reingresos del 10,7%. En el grupo B el tiempo quirúrgico fue de 111 ± 43 , una media de 8,7 días de ingreso; no precisaron tratamiento además de la cirugía el 68% de los casos. La evolución fue satisfactoria en todos los casos menos en 7, no hubo mortalidad en este grupo. Tuvimos una tasa de reingreso del 2%.

Conclusiones: Continuamos realizando una proporción importante de tratamiento conservador en detrimento de la cirugía urgente, en números absolutos éste parece tener mayor tasa de complicaciones, de mortalidad y de tiempo de ingreso hospitalario.

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Introduction

Laparoscopic cholecystectomy is now the treatment of choice for symptomatic cholelithiasis. However, the treatment of choice for acute cholecystitis (AC) has been changing over the years, together with the development of the technique. In the 1980s, early open cholecystectomy was the treatment of choice for AC. Then in the 1990s, with the development of the laparoscopic technique, some studies emerged that warned that its use during an acute episode^{1,2} posed a high risk of complications, a longer operative period and a high rate of conversion to open surgery. Doctors then began to delay the surgical treatment of AC by first treating it conservatively and performing the surgery later. Nevertheless, laparoscopy development in recent years has shown encouraging figures for AC emergency treatment: hospital stays have become shorter and the amount of complications and conversions to open surgery has not increased compared with elective or delayed surgery.

In 2007, we treated a total of 178 patients with symptoms of acute cholecystitis in our hospital. One hundred twenty-one did not undergo surgery, thereby deferring it, and 53 underwent surgery at the time of arrival at the emergency department. We have conducted a review the reasons why surgery should not be performed and we have compared conservative management and surgical treatment results. We have also observed the course of both groups after treating the acute episode.

Material and method

We conducted a retrospective study (cases and controls) of 178 patients who were treated at the emergency department

with a diagnosis of AC between January and December 2007. Of these patients, 125 (70.2%) were treated conservatively (group A), and 53 (29.8%) underwent surgery in the first 72 hours following diagnosis (group B).

The study variables were as follows: age, gender, patient's medical and personal history, examination, results of the imaging techniques used, laboratory results, reasons for not receiving emergency treatment, treatment given, length of hospital stay, course, readmission rate, morbidity and mortality.

The data were analysed using SPSS version 12.0 software.

Results

The average age of all patients was 72.15 ± 17.46 years, and there were 79 women (44.4%) and 99 men (55.6%).

From their medical history, we wish to note the following: DM: 46 (26.1%); cardio-pulmonary diseases: 73 (41.5%); previous treatments: 68 (35.2%); patients who consumed antiplatelet agents: 44 patients (25%); anticoagulants: 6 (3.4%); and oral antidiabetics: 12 (6.8%).

The physical examination showed mainly pain in the upper right quadrant (171, 96.6%), positive Murphy's sign (85, 48%), fever (58, 32.8%), haemodynamic instability—defined as hypotension and tachycardia, i.e. systolic blood pressure less than 90 mmHg and HR higher than 100 lpm—(5, 2.8%) and palpable gallbladder (7, 4.0%).

The diagnosis was confirmed with imaging and laboratory tests. Among the imaging tests, ultrasound was the most used (172, 98.3%), while CT was much less used as it was only performed on 17 patients (9.7%). Table 1 shows the laboratory findings obtained for both groups.

According to the treatment administered, we had two groups: group A (conservative treatment) and group B (emergency cholecystectomy). Table 2 shows the gender distribution for both groups and a comparison of their medical history. The mean age for group A was 71.3 ± 15.5 years (20-93, Me: 75), and for group B was 58.7 ± 18.8 years (20-82, Me: 66) ($P > .01$).

The same clinical data were noted down in both groups. They appear in Figure 1.

In terms of imaging tests, 122 scans (91.2%) and 12 CT (9.7%) were performed in group A, while data for group B were 50 (96.2%) and 5 (9.6%) respectively, taking into account that in some cases (11) we had to perform both tests to reach the final diagnosis.

In group A we decided not to perform emergency surgery but to start a conservative treatment instead. Figure 2 shows the reasons for this decision. In total, 96 cases were treated (78%) with antibiotics alone, 15 (12.2%) with antibiotics and percutaneous cholecystostomy and 12 (9.8%) with antibiotics combined with Endoscopic Retrograde Cholangiopancreatography (ERCP). There were no cases where we needed to carry out Transparietohepatic Cholangiography (CTPH).

The hospital stay for this group was 11 days (± 5.9 ; median: 9 days; CI: 2-33), with satisfactory course in 79.2% of the cases (98). In this group, there was a mortality rate of 5.6% (7 cases).

Once discharged, we had a readmission rate of up to 10.7% of the cases (13) in which emergency surgery was not

performed. Cholecystectomy was scheduled and performed in 49 cases (40.5%), and only in 39 of these cases were we able to remove it by laparoscopy. We therefore performed open surgery in 10 cases. Of all the patients, 44.6% (54 cases) were not readmitted, nor did they have any other complications secondary to cholecystitis, nor have to undergo a scheduled surgery to date.

In group B we decided to perform emergency cholecystectomy, which was carried out laparoscopically

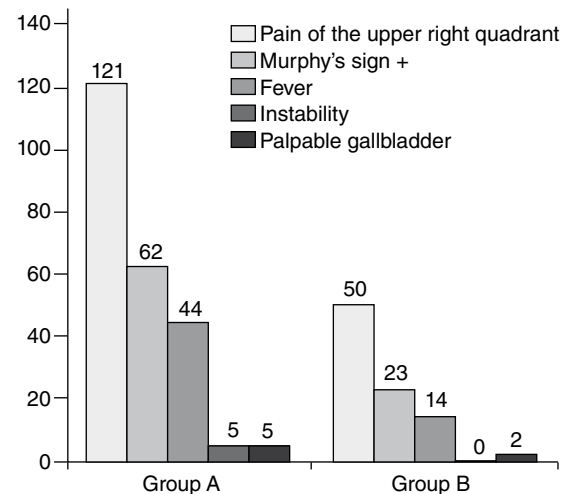


Figure 1 - Clinical and examination data.

Table 1 - Laboratory data

	Group A	Group B	Total
Leukocytes	14,063.5 \pm 5,613; Me: 13,500	14,357.4 \pm 4,707.4; Me: 14,100	14,150.6 \pm 5,348.6; Me: 13,900
Platelets	227,203.4 \pm 89,861.1; Me: 207,000	247,598 \pm 77,429.1; Me: 242,000	233,394.6 \pm 86,558.9; Me: 212,500
Haemoglobin	13.6 \pm 1.4; Me: 13.7	14.1 \pm 1.8; Me: 14.35	13.7 \pm 1.6; Me: 13.9
GOT	116.2 \pm 177.3; Me: 27	62.38 \pm 133.1; Me: 24	100.3 \pm 166.89; Me: 28
GPT	123.8 \pm 219.6; Me: 34	71.8 \pm 129.5; Me: 27	108.75 \pm 198.8; Me: 30
Amylase	70.6 \pm 194.6; Me: 42	44 \pm 22.9; Me: 39	62.3 \pm 161.9; Me: 41
GGT	283.5 \pm 315.5; Me: 203	75.5 \pm 106; Me: 38	202.3 \pm 273.7; Me: 75.5
FA	198.8 \pm 224.7; Me: 123	95.5 \pm 60.4; Me: 79	161.7 \pm 189.3; Me: 104
Fibrinogen	705 \pm 306.2; Me: 638	606.6 \pm 276.4; Me: 522	676.2 \pm 300.3; Me: 612
Creatinine	1.12 \pm 0.53; Me: 0.95	0.97 \pm 0.29; Me: 0.9	1.1 \pm 0.5; Me: 0.92
BRT	1.85 \pm 1.49; Me: 1.31	1.4 \pm 0.9; Me: 1.3	1.7 \pm 1.4; Me: 1.3

Me: median.
Patients were hospitalised for an average of 10.63 \pm 6.4 days (2-36), a median of 9.

Table 2 - Gender and medical history of each group

	Gender	Diabetes	Cardio-pulmonary infarction	Pre-medication
Group A	67 (53.6%) men 58 (46.4%) women	29 (23.6%)	64 (52%)	51 (41.5%)
Group B	32 (60.4%) men 21 (39.6%) women	17 (32.1%)	9 (17%)	11 (20.8%)
P	less than .01	less than .01	less than .01	less than .01

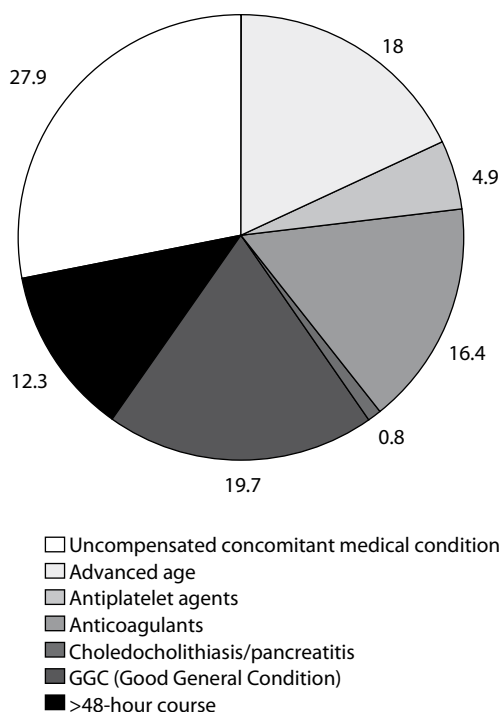


Figure 2 – Reasons not to perform emergency surgery.

without using other techniques in 60.4% of the cases (32), while open surgery was carried out in 35.8% (19). Open surgery to examine the bile duct was required only in two cases (3.8%). Five of the patients in group B underwent intraoperative cholangiography (10.4%).

The mean operative time was 111 ± 43.3 (40-240, Me: 100 min), which broken down by type of surgery was 110 ± 36 for laparoscopic surgery and 111.8 ± 54.5 for open surgery, with a conversion rate of 5% (two cases).

This group was hospitalised for an average of $8.7 \text{ days} \pm 8.5$ (2-36, Me: 6.5) (*P* significant compared with group A), and it did not require any treatment other than the surgery performed in 68% of the cases (34), while antibiotics were administered in 32% (16 cases).

The post-operative course was satisfactory in all but 7 cases (14.6%), where complications developed. There was no mortality in this group. Following discharge, none of the patients had any problems with regard to bladder disease, except for 2% of the cases who were readmitted.

Discussion

Laparoscopic cholecystectomy (LC) is now considered the treatment of choice for symptomatic cholelithiasis, but its widespread application in cases of acute cholecystitis is not commonly accepted.⁴ With the laparoscopy explosive growth of the 1990s, it seemed obvious that this technique would be recommended not only for gallstones but also for acute cholecystitis. Nevertheless, in recent years some authors have provided data showing a higher complication rate, a higher operative time and a higher conversion rate than in

elective surgery.¹ This is why there is a widespread attitude of delaying emergency surgery to a scheduled one, thus “slowing down” the acute process with medical treatment.¹

We should also consider the fear of more bleeding, which may occur in the first hours after the onset of the inflammatory process due to the oedema that accompanies inflammation. Nevertheless, the maturity of the acute process entails more fibrosis, revascularisation and contraction, which render the dissection more complex technically, and the surgery potentially more damaging. In contrast, oedema of the inflammatory connective tissue facilitates the dissection of Calot's triangle.^{7,9}

There is arguably a consensus that if doctors decide to operate on the patient, surgery should take place within the first 72 hours after the onset of the symptoms⁸ in order to prevent an already progressed inflammatory process. Therefore, in our study, one of the important reasons not to operate was a longer course of the symptoms, a situation that is relatively common. However, a 2006 Cochrane review by Gurusamy refers to early surgery as that which is performed up to 7 days after the onset of symptoms, while delayed surgery was referred to as that which is performed more than six weeks later.¹⁰ Furthermore, last year, Tamim Siddiqui published a meta-analysis which states that early surgery reduces the length of hospital stay without increasing conversion or complications rates, issues that doctors fear.⁹

The delay in the surgical treatment of cholelithiasis is associated with a significant percentage of complications and a longer hospital stay. In fact, Friedman describes an annual⁵ percentage of 6% of complications in gallstones that are not operated on. A meta-analysis carried out by Lau found that early surgery reduces hospital stay and the risk of readmission for biliary disease.⁶ In our study, we found that despite being treated with proper antibiotics and even when signs of improvement are shown, there is a readmission rate for biliary disease of up to 10.7% when emergency surgery for acute cholecystitis is not performed. We also found that the patients who did not undergo surgery presented a longer hospital stay, a higher morbidity rate and, more importantly, a higher mortality rate.

In the group of patients who did not undergo surgery there was no significant difference in the surgery times according to the technique used: laparoscopic or open surgery.

In further evaluating the reasons not to operate, we observed that, with respect to age, Bueno Lledó's group recently published a study comparing the results of LC carried out in two different age groups. They found that although it should not be a limiting factor, a patient of more than 65 years of age has an increased risk of conversion and a higher rate of morbidity than in younger population.³ In our study, up to 4.5% of the patients did not undergo surgery due to an advanced age.

The patient's general deterioration or death are also important reasons to try another type of treatment to resolve the emergency. Li et al.¹¹ support the use of percutaneous cholecystostomy in cases of extreme severity and of advanced age rather than emergency surgery. They observed good results with minimal complication rates associated with the procedure.

In 19.7% of the cases, the patient did not undergo surgery due to a suspected or confirmed choledocholithiasis with or without pancreatitis. Hammarström and Ranstam conducted a study that showed a data correlation between bilirubin and the activity of gamma-glutamyltransferase with gallstones in the bile duct, with a sensitivity of 61% and a specificity of 93%.¹² We have used both of these data as criteria for choledocholithiasis. Nardi¹³ conducted a study comparing the various options in the treatment of choledocholithiasis: sequential treatment (first carrying out ERCP and convert to laparoscopic cholecystectomy, or vice versa) or combined treatment (laparoscopic cholecystectomy with intraoperative ERCP). Better results for morbidity and hospital stay were obtained with the second option. However, Franceschi et al.¹⁴ advocate and perform ERCP before surgery, and if necessary, they even perform sphincterotomy, avoiding having to perform intraoperative choledochotomy and removal of the gallstone by laparoscopy.

Another good reason not to perform emergency surgery is a patient's good general condition. It is possible that the GGC is due to the fact that the symptoms of cholecystitis are emerging or that it is only a case of biliary colic, whose symptoms are often a precursor for cholecystitis. Nevertheless, this should not be a reason for non-surgery. Gurusamy¹⁰ believes that we should perform surgery on gallstones in the first 24 hours after onset, since surgery decreases morbidity while waiting for a scheduled cholecystectomy. He also believes that surgery decreases the conversion rate, operative time and hospital stay.

Regarding anticoagulation or antiplatelet therapy, there are few series focusing on this issue. However, Yoshida¹⁵ already states that the low invasion that laparoscopic surgery entails is much easier to handle in patients with cholelithiasis who take antiplatelet agents or anticoagulants. Antiplatelet therapy does not involve a contraindication in cardiac or vascular surgery. Instead, it is very common in the surgery of patients on antiplatelet agents for these specialists. Anticoagulation can be reversed by PFC, thus delaying surgery for a few hours, which should not be considered a contraindication.

Conclusions

In conclusion, we continue carrying out a large proportion of conservative treatment in place of emergency surgery. In absolute numbers, conservative treatment seems to have higher complication and mortality rates and a longer hospitalisation stay. Laparoscopic cholecystectomy is the treatment of choice for acute cholecystitis in the early hours of the course of the disease and in patients without high surgical risk.

Conflict of Interest

The authors declare that they have no conflict of interest.

REFERENCES

1. Cuschieri A. Approach to the treatment of acute cholecystitis: open surgical, laparoscopic or endoscopic? *Endoscopy*. 1993; 25:397-8.
2. Kum CK, Eypasch E, Lefering R, Paul A, Neugebauer E, Troidl H, et al. Laparoscopic cholecystectomy for acute cholecystitis: is it really safe? *World J Surg*. 2003;20:43-9.
3. Bueno Lledó B, Bueno Lledó J, Serralta Serra A, Planells Roig M, Rodero Rodero D. Colecistitis aguda y colecistectomía laparoscópica en el paciente anciano. *Cir Esp*. 2007;81:213-7.
4. Asoglu O, Ozmen V, Karanlik H, Igci A, Kecer M, Parlak M, et al. Does the complication rate increase in laparoscopic cholecystectomy for acute colecistitis? *J Laparoendosc Adv Surg Tech A*. 2004;14:81-6.
5. Friedman G. Natural history of asymptomatic and symptomatic gallstones. *Am J Surg*. 1993;165:399-403.
6. Lau H, Lo CY, Patil NG, Yuen WK. Early versus delayed-interval laparoscopic cholecystectomy for acute cholecystitis. *Surg Endosc*. 2006;20:82-7.
7. Serralta AS, Bueno JL, Planells MR, Rodero DR. Prospective evaluation of emergency versus delayed laparoscopic cholecystectomy for early cholecystitis. *Surg Laparosc Endosc Percutan Tech*. 2003;13:71-5.
8. Gardner B, Masur R, Fujimoto J. Factors influencing the timing of cholecystectomy in acute cholecystitis. *Am J Surg*. 1973; 125:730-3.
9. Siddiqui T, MacDonald A, Chong PS, Jenkins JT. Early versus delayed laparoscopic cholecystectomy for acute cholecystitis: a meta-analysis of randomized clinical trials. *Am J Surg*. 2008;195:40-7.
10. Gurusamy KS, Samraj K. Early versus delayed laparoscopic cholecystectomy for acute colecistitis. *Cochrane Database Syst Rev*. 2006;4:CD005440. Review.
11. Li JC, Lee DW, Lai CW, Li AC, Chu DW, Chan AC, et al. Percutaneous cholecystostomy for the treatment of acute cholecystitis in the critically ill and elderly. *Hong Kong Med J*. 2004;10:389-93.
12. Hammarström L, Ranstam J. Factors predictive of bile duct stones in patients with acute calculous cholecystitis. *Dig Surg*. 1998;15:323-7.
13. Nardi M, Perri SG, Pietrangeli F, Amendolara M, Dalla Torre A, Gabbrielli F, et al. Sequential treatment: is it the best alternative in cholecysto-choledochal lithiasis? *Chir Ital*. 2002;54:785-98.
14. Franceschi D, Brandt C, Margolin D, Szopa B, Ponsky J, Priebe P, et al. The management of common bile duct stones in patients undergoing laparoscopic cholecystectomy. *Am Surg*. 1993;59:525-32.
15. Yoshida T, Kitano S, Matsumoto T, Bandoh T, Baatar D, Ninomiya K, et al. Laparoscopic cholecystectomy in patients undergoing anticoagulant therapy. *Surg Today*. 1998;28: 308-12.