



Original article

## Acute cholecystitis – room for improvement?

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**Aims:** A recent survey of UK general surgeons showed that almost 90% prefer to manage patients with acute cholecystitis by initial conservative management and delayed cholecystectomy (DC). The aim of this study was to assess the effectiveness of this management policy in a large university hospital.

**Patients and Methods:** All patients admitted with acute cholecystitis between January 1997 and June 1999 who went on to have a cholecystectomy were identified. Patients were required to have right upper quadrant pain for > 12 h, a raised white cell count and findings consistent with acute cholecystitis on ultrasound to be included in the study.

**Results:** 109 patients were admitted with acute cholecystitis (76 female, 33 male) with a median age of 62 years (range, 22–88 years). Conservative management failed in 16 patients (14.7%) who underwent emergency cholecystectomy due to continuing symptoms (9), empyema (4) and peritonitis (3). Symptoms settled in 93 patients and delayed cholecystectomy was performed without further problems in 66 (60.6%). 27 patients were re-admitted with further symptoms before their elective surgery and, of these, 3 were admitted for a third time before surgical intervention. Ten of the 30 re-admission episodes (33%) occurred within 3 weeks of discharge but 15 (56%) occurred more than 2 months after discharge. Elective surgery was undertaken at a median of 10 weeks post-discharge with 67% of operations occurring within 3 months. Mean total hospital stay (days)  $\pm$  SEM, for the three groups were: emergency surgery group,  $10.21 \pm 0.85$ ; uncomplicated DC group,  $12.48 \pm 0.37$ ; re-admitted group,  $14.75 \pm 0.71$ .

**Conclusions:** The policy of conservative management and DC was successful in 60.6% of cases but 14.7% of patients required emergency surgery and 24.8% were re-admitted prior to elective surgery with a resultant increase in total hospital stay. Performing elective surgery within 2 months of discharge in all cases would have reduced the re-admission rate by 56% and this along with the increased use of early cholecystectomy during the first admission are areas where the treatment of acute cholecystitis could be significantly improved.

**Key words:** Cholecystitis – Conservative management – Delayed cholecystectomy – Survey

The two main treatment options for acute cholecystitis, in patients fit for surgery, are either initial conservative treatment followed by delayed cholecystectomy, most commonly 6–8 weeks after discharge, or planned

early cholecystectomy during the initial hospital admission. A recent survey of UK general surgeons revealed that only 12% routinely use early cholecystectomy in the management of acute cholecystitis, the remainder

preferring conservative management and delayed cholecystectomy.<sup>1</sup> The aim of this study was to evaluate the policy of delayed cholecystectomy in acute cholecystitis and identify areas where improvements could be made.

### Patients and Methods

The study was carried out at the Royal Hallamshire Hospital in Sheffield, UK where conservative treatment followed by delayed cholecystectomy is the standard management for acute cholecystitis. Between January 1997 and July 1999, 109 patients were admitted with acute cholecystitis, who went on to have a cholecystectomy. Of these, 76 patients were female and 33 male with a median age of 62 years (range, 22–88 years). Patients admitted with biliary colic and acute pancreatitis were excluded, as were patients admitted with acute cholecystitis who were medically unfit to undergo cholecystectomy. The diagnosis of acute cholecystitis was based on the following three criteria, all of which had to be met for patients to be included in the study group: (i) acute upper abdominal pain of at least 12 h duration with associated right upper quadrant tenderness; (ii) a leukocytosis of greater than  $10 \times 10^9 \text{ l}^{-1}$ ; and (iii) ultrasonographic evidence of acute inflammation (gallbladder tenderness, oedematous wall, pericholecystic fluid).

### Results

Conservative management failed in 16 patients (14.7%), all within the first 6 days after admission and emergency cholecystectomy was undertaken. The indications for emergency surgery were continuing symptoms of pain and right upper quadrant tenderness in 13 patients, of whom 4 had developed an empyema, and peritonitis due to gall bladder perforation in 3.

Ninety-three patients were successfully treated conservatively during the initial admission with full resolution of symptoms. Of these patients, 66 (60.6%) underwent delayed interval cholecystectomy without further significant symptoms. However, 27 patients (24.7%) were re-admitted to hospital with further symptoms before their admission for elective surgery. Four patients underwent urgent surgery during their second hospital admission and 20 were re-admitted electively for surgery following a further period of conservative management. Three patients were re-admitted to hospital for a third time as an emergency before elective cholecystectomy could be undertaken.

The timing of the first re-admission episodes in relation to initial hospital discharge is shown in Figure 1. This demonstrates that one-third of re-admissions occurred within the first month followed by a steady rate over the following 6 months. Of the re-admissions, 15 (56%) occurred

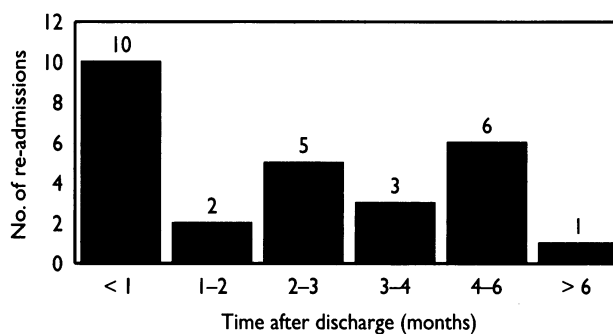


Figure 1 Timing of first re-admission after hospital discharge.

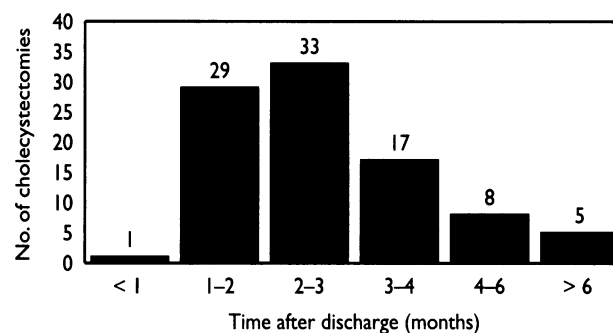


Figure 2 Timing of cholecystectomy after initial hospital discharge.

more than 2 months after discharge. One patient was re-admitted with acute pancreatitis and underwent cholecystectomy during the admission. The remaining patients complained of a further attack of right upper quadrant pain and right upper quadrant tenderness was present in 20 patients. Eighteen had a raised white cell count indicating continuing or recurrent inflammation/infection and 22 patients received a second course of antibiotic therapy.

Elective surgery was undertaken at a median time of 10 weeks following hospital discharge with 68% of operations being performed within 3 months. The timing of elective cholecystectomy following hospital discharge is summarized in Figure 2. Postoperative morbidity was 12.8% with 14 patients having a variety of complications which are shown in Table 1. One elderly male patient died in the peri-operative period from cardiac failure after suffering a myocardial infarction whilst undergoing surgery. He had been assessed in the surgical clinic following discharge and had on-going gallstone-related symptoms. He requested surgery which was undertaken as he had no previous history of cardiovascular or respiratory disease. Two patients required a second operation, one due to post-operative haemorrhage and one due to the development of a persistent bile leak.

Table 1 Morbidity after cholecystectomy

Complication	Number	Timing of surgery
Wound infection	4	2 emergency 2 delayed
Bile leakage	3	3 delayed
Chest infection	3	2 delayed 1 emergency
Urinary tract infection	2	2 delayed
Intraperitoneal haemorrhage	1	1 delayed
Myocardial infarction (died)	1	1 delayed

All emergency procedures were carried out by open surgery, with the remaining 93 patients undergoing laparoscopic cholecystectomy in 53 cases (conversion rate 8%) and small incision cholecystectomy in 40 cases, depending on consultant preference. The mean total hospital stay for those patients requiring an emergency operation during their first admission ( $10.21 \pm 0.85$  days) was significantly lower than the uncomplicated delayed cholecystectomy group ( $12.48 \pm 0.37$  days) and the group requiring re-admission before surgery ( $14.75 \pm 0.71$  days), using the Mann-Whitney test,  $P = 0.037$  and  $P = 0.008$ , respectively. Sub-analysis of the latter two groups according to whether the cholecystectomy was performed laparoscopically or open failed to show any significant difference in the mean total hospital stay.

## Discussion

Following the development and popularisation of laparoscopic surgery, several authors expressed concern about the safety of laparoscopic cholecystectomy in the presence of acute cholecystitis,<sup>2,3</sup> especially with regard to biliary complications. The timing of surgery in early cholecystectomy also appears to be an important factor, with some authors stating that it should be within 72–96 h of symptom onset,<sup>4,5</sup> whilst others have demonstrated good results up to 1 week after symptom onset or within 72 h of hospital admission.<sup>6</sup> Many authors, however, have now reported that early laparoscopic cholecystectomy is a safe procedure in experienced hands.<sup>7–10</sup>

Randomised, controlled trials have shown that early cholecystectomy has significant benefits over delayed surgery in acute cholecystitis, whether this is performed by open surgery<sup>11,12</sup> or by laparoscopic techniques.<sup>6,13</sup> These studies have demonstrated that early cholecystectomy is more cost-effective, with patients having a shorter total hospital stay and recuperation time compared to delayed surgery. In addition, there were no significant differences in the complication rate between

the early and delayed cholecystectomy groups, or the conversion rate in the laparoscopic trials. A randomised, controlled trial comparing open and laparoscopic early cholecystectomy for acute cholecystitis recently reported an advantage for early laparoscopic cholecystectomy in terms of reduced total hospital stay and time off work.<sup>14</sup>

Early cholecystectomy must, therefore, be regarded as the treatment of choice for acute cholecystitis in patients fit for surgery, and this may be safely undertaken by the laparoscopic method by suitably competent surgeons. This practice is not widespread in the UK at present, however, with only 12% of general surgeons routinely opting for early cholecystectomy. The most commonly encountered problems with this practice seem to be logistical, with the limited availability of suitably experienced surgeons, due to other commitments, and theatre time being highlighted recently.<sup>1</sup>

This study follows a cohort of 109 patients admitted with acute cholecystitis who subsequently went on to have a cholecystectomy. In all cases, the initial intention was to treat the patients conservatively with delayed cholecystectomy occurring at a later date. Overall delayed cholecystectomy proceeded without further problems in only 60% of cases, the remaining patients either undergoing an emergency operation during the first hospital admission (15%) or being re-admitted to hospital with further symptoms before elective cholecystectomy (25%). Delayed cholecystectomy is notoriously difficult within the first month after acute cholecystitis, therefore making the early group of patient re-admissions largely unavoidable with this management strategy. Performing elective surgery in all patients 6–8 weeks after discharge would have reduced the re-admission rate by 56% in this series. This is assuming, however, that delayed cholecystectomy can be performed at this time, which is becoming increasingly difficult due the variable availability of beds for elective surgical patients especially during the winter months, a fact that further strengthens the argument for early cholecystectomy.

There appear to be several ways in which the management of acute cholecystitis could be improved. We suggest a practical policy workable within the National Health Service in the UK at present would be to encourage, whenever possible, early cholecystectomy in fit patients in whom the diagnosis is clear, and in whom surgery can be performed within 72 h of admission or 1 week from the onset of symptoms. Patients not meeting these criteria and those in whom the diagnosis is initially equivocal, could be managed conservatively and delayed cholecystectomy performed (bed availability permitting) 6–8 weeks later. Patients unfit for surgery should be managed conservatively with percutaneous gall bladder drainage being undertaken when necessary.

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