

## Short research article

# Acute Cholecystitis in the Elderly: Current Update on Management

### Abstract

Acute cholecystitis in the elderly is a common condition and its management has been undergoing a change over the past decade. The management of this condition can be divided into conservative treatment and surgical treatment. Conservative treatment involves the use of antibiotics and percutaneous cholecystostomy. Surgical treatment involves open and laparoscopic cholecystectomy. The cholecystectomy can be performed as an early or interval laparoscopic cholecystectomy. As there is no consensus in the management of acute cholecystitis in the elderly, we have conducted this review article to look at the management of this condition, including the role of percutaneous cholecystostomy and laparoscopic cholecystectomy.

Keywords-Acute calculus cholecystitis in the elderly, acute cholecystitis in the elderly, laparoscopic cholecystectomy, percutaneous cholecystostomy and open cholecystectomy

### Introduction

Acute cholecystitis is a condition that is characterized by inflammation of the gallbladder that is due to obstruction of the cystic duct by gallstones. It is seen in about 20% of patients who present with symptoms of biliary colic. 95% of cases of acute cholecystitis are due to gallstones and this condition is predominantly seen in females. The management of acute cholecystitis can be divided into conservative treatment with intravenous antibiotics and surgical treatment which includes cholecystectomy(1).

The management of acute cholecystitis was based on its severity by the grading system of the Tokyo Guidelines (TG). Grade 1 was patients with mild acute cholecystitis with no organ dysfunction, Grade 2 is acute cholecystitis with associated positive murphy's sign, leukocytosis, duration of symptoms of more than 72hours and marked local inflammation. Grade 3 is acute cholecystitis with any of the following system dysfunction which includes cardiovascular, respiratory, neurological, hepatic or hematological. Patients with grade 1 are treated with elective cholecystectomy, patients with grade 2 are management with early cholecystectomy and patients with grade 3 are managed with percutaneous cholecystostomy followed by interval cholecystectomy(2-5)

The 2017 World Society of Emergency Surgeons (WSES) guidelines on the management of acute calculus cholecystitis in the elderly by Pisano et al, defined old age as a composite of multiple factors including chronological age, social factors, economic factors, cultural factors and functional status. Patients who were 65 years of age and above were defined as elderly patients and the definitive management of

acute cholecystitis in the elderly was laparoscopic cholecystectomy, with percutaneous cholecystostomy being reserved for high risk and unfit patients as a bridging procedure to stabilize them before performing an interval laparoscopic cholecystectomy(6)

The World Society of Emergency Surgeons guidelines of the diagnosis and management of acute calculus cholecystitis of 2020 have high risk patients like elderly patients who are not fit for laparoscopic cholecystectomy, may be offered percutaneous cholecystostomy followed by an interval cholecystectomy once the patient was fit. Laparoscopic cholecystectomy is still considered the definitive treatment of acute cholecystitis in the elderly (7)

As there is no current consensus in the management of acute cholecystitis in the elderly with regards to the role of laparoscopic cholecystectomy, the time of performing laparoscopic cholecystectomy and if it should be performed as an early or delayed procedure. The indication of percutaneous cholecystostomy in the management of acute cholecystitis in the elderly has not been defined, and the time of removal of the tube has also not been defined. We have conducted this review article looking for answers for all these factors in the management of acute cholecystitis in the elderly. We conducted a literature review using PUBMED, the Cochrane database of systemic reviews, Google scholar and semantic scholar looking for randomized control trials, non-randomized trials, observational and cohort studies, clinical reviews, systemic reviews, and meta-analysis from 1990 to 2024. The following keywords were used, "acute calculus cholecystitis in the elderly", "Acute cholecystitis in the elderly", "laparoscopic cholecystectomy", "percutaneous cholecystostomy "and "open cholecystectomy". All articles were in English, and all articles were assessed by manual cross referencing of the literature. Commentaries, case reports and editorials were excluded from this review. Adult male and female patients were included in this study and pediatric patients were excluded.

### **Conservative treatment and percutaneous cholecystostomy in acute cholecystitis in the elderly**

Conservative treatment involves the use of intravenous antibiotics, analgesics and intravenous fluids and once their symptoms improve, they are then assessed if they are fit for a cholecystectomy. For patients who did not undergo a cholecystectomy, the recurrence rate may be as high as 40% in the elderly patients(8,9)A retrospective study was conducted by McGillicuddy et al on the non-operative management of acute cholecystitis in the elderly. In this study 185 out of 290 patients with acute cholecystitis underwent conservative treatment and the recurrence rate after 2 years was 4% but there were limitations to this study due to the low patient numbers and the retrospective nature of the study(10)

Percutaneous cholecystostomy is an interventional radiological procedure that is done under ultrasound guided control where a catheter is inserted into the gallbladder to drain the bile. It can be performed either by a transhepatic or a transperitoneal approach. This procedure is used as a bridge to surgical treatment by converting a septic to a non-septic patient. The transhepatic route is the most common route that is used, and the tube is kept for 4 weeks(11,12)For patients who fail to undergo a cholecystectomy due to the presence of co-morbidities or who are unfit for surgery, the recurrence rate of acute cholecystitis after percutaneous cholecystostomy is about 39%(13)

The efficacy of percutaneous cholecystostomy was assessed by Ni et al in the management of acute cholecystitis in high-risk elderly patients and this study concluded that though the recurrence rate was high, percutaneous cholecystostomy was safe, effective and able to alleviate the symptoms of high-risk elderly patients who were not fit for surgery(14,15) Among the factors that favor the use of percutaneous cholecystostomy in the elderly high risk patients include, age, a high American Society of Anesthesia score and past medical history of cerebrovascular accident(16)

Percutaneous cholecystostomy has been proposed to be a definitive form of treatment for elderly high-risk patients who are not fit to undergo a cholecystectomy. The procedure was fast and easy to do. It was associated with reduced morbidity and mortality. The procedure related morbidity and mortality was also reduced(17,18). Some have considered it as a definitive form of therapy for acute cholecystitis in the elderly as it is able to control local symptoms and inflammatory response(19)

A systemic review and meta-analysis by Cirocchi et al compared percutaneous cholecystostomy as a definitive form of therapy versus emergency cholecystectomy in the management of acute cholecystitis in the high-risk patients. 17 studies that included 783,672 patients were included in the study, of which 32,634 underwent percutaneous cholecystostomy and 751,038 underwent cholecystectomy. The mortality in the percutaneous cholecystostomy group was 13.78% and emergency cholecystectomy was 2.37%. The length of hospital stays, and risk of recurrence was lower in the group that underwent emergency cholecystectomy. This study showed that emergency cholecystectomy was associated with better outcomes when compared to percutaneous cholecystostomy in the management of acute cholecystitis in the high-risk patients(20)

A retrospective study by Schlottmann et al compared percutaneous cholecystostomy with cholecystectomy in the management of acute cholecystitis in the elderly. 200,915 patients were included in this study, 7516 underwent percutaneous cholecystostomy and 193,399 underwent cholecystectomy. The morbidity and mortality were higher in the percutaneous cholecystostomy group. The recurrence rate was also higher in the percutaneous cholecystostomy group. This study concluded that cholecystectomy is associated with better outcomes than percutaneous cholecystostomy in the management of acute cholecystitis in the elderly(21)

Another systemic review and meta-analysis by Markopoulos et al looked at the outcomes of percutaneous cholecystostomy in elderly patients. 20 studies that included 689,874 patients were included, of which 28,241 underwent percutaneous cholecystostomy, 661,633 underwent cholecystectomy and 694 conservative treatment. The mortality rate and readmission rate were higher in the percutaneous cholecystostomy group. The patients who underwent a cholecystectomy were associated with better outcomes in the management of acute cholecystitis in the elderly(22).

### **Laparoscopic cholecystectomy in the management of acute cholecystitis in the elderly**

Laparoscopic cholecystectomy is considered the gold standard in the management of acute cholecystitis, but its safety was initially questioned in the elderly patients. The presence of co-morbidities like diabetes mellitus, hypertension and the limited functional capacity of these patients was initially thought to increase the surgical morbidity and mortality. Several studies have shown that laparoscopic cholecystectomy can be safely performed in elderly patients, and it is associated with reduced morbidity, mortality and length of hospital stay(23) It should be kept in mind that the recovery is often slower in

these patients and the presence of co-morbidities and respiratory complication may make the follow-up period complicated(24–29).

Laparoscopic cholecystectomy can be performed as an elective or emergency procedure when treating elderly patients with acute cholecystitis. It can be safely done, and it can be done as early as possible, even during the index admission(30)It should be offered to elderly patients with acute cholecystitis to prevent recurrence and to treat the underlying pathology(31)

With better surgical techniques and perioperative care, early laparoscopic cholecystectomy has been suggested for the treatment of acute cholecystitis in the elderly by a retrospective study by Loozen et al. This study showed that early laparoscopic cholecystectomy for mild to moderate acute cholecystitis was associated with a perioperative morbidity of 17% and mortality of 3% and this study concluded that early laparoscopic cholecystectomy is suitable for elderly patients with acute cholecystitis(32)

A systemic review and meta-analysis for acute cholecystitis in the elderly population was conducted by Loozen et al. 8 studies with 592 patients were included in the study, 316 underwent early laparoscopic cholecystectomy and 276 underwent open cholecystectomy. The perioperative morbidity was 24% and the mortality was 3.5%. This study concluded that early laparoscopic cholecystectomy was feasible in the treatment of acute cholecystitis in the elderly(33)

A multicenter randomized clinical trial comparing laparoscopic cholecystectomy versus percutaneous catheter drainage for acute cholecystitis in high-risk patients (CHOCOLATE) was conducted by Loozen et al. 142 high risk patients were included in this study; 66 underwent laparoscopic cholecystectomy and 68 underwent percutaneous drainage. There was no difference with regards to the mortality rate between the groups, but the major complication rate was 65% in the percutaneous cholecystostomy group and 12% in the laparoscopic cholecystectomy group. The recurrence rate was 55% in the percutaneous cholecystostomy group and 5% in the laparoscopic cholecystectomy group. This study concluded that laparoscopic cholecystectomy was associated with better outcomes than percutaneous cholecystostomy in the management of acute cholecystitis in the high-risk groups(34)

Laparoscopic cholecystectomy can also be safely performed in the extreme elderly patients. These are patients who are above the age of 80 years. Several studies have compared laparoscopic cholecystectomy for acute cholecystitis in these patients and found that the morbidity and mortality were similar with those patients who were below 70 years of age, although age above 80 years is an independent risk factor for morbidity. These patients were however at risk due to their underlying co-morbidities which may contribute to the morbidity and mortality. Several precautions that need to be taken include the intraabdominal pressure and position of the patient as this may affect the cardiac output in these patients (35–39).

Delayed laparoscopic cholecystectomy has been used in the management of severe acute cholecystitis in elderly patients. This procedure is performed after treatment with percutaneous cholecystostomy and intravenous antibiotics. Several studies investigated delayed laparoscopic cholecystectomy and noted that the conversion rate was high ranging from 5% to 30% (40).

**Table I** Outcome of the randomized control trial

Study	Year	Study type	N=numbers	Major complications for laparoscopic cholecystectomy	Major Complications for percutaneous cholecystostomy
Loozen et al	2018	Multicenter randomized control trial	142- 66-laparoscopic cholecystectomy 68- percutaneous cholecystostomy	12%	65%

Table showing the outcome of the randomized control trial by Loosen et al comparing laparoscopic cholecystectomy versus percutaneous cholecystostomy in acute cholecystitis in the high-risk patients.

### Conclusion

The management of acute cholecystitis in the elderly usually begins with conservative treatment followed by an interval cholecystectomy. Laparoscopic cholecystectomy is considered the gold standard in the management of acute cholecystitis in the elderly. For high-risk elderly patients percutaneous cholecystostomy is used as a bridging procedure to stabilize them for an interval cholecystectomy. Early cholecystectomy is now being proposed for the management of acute cholecystitis in the elderly, but its uptake is still low in many countries.

Common problems include the experience of the surgeon in performing a laparoscopic cholecystectomy in the elderly, the anesthetic problems that can be encountered and the high rate of conversion to an open cholecystectomy. In some elderly patients percutaneous cholecystostomy becomes a definitive form of treatment as these patients are not fit for surgery. The management of acute cholecystitis in the elderly is important as we have a growing number of elderly patients and definitive management of this condition is important to prevent recurrence. The reluctance of elderly patients to undergo surgery is another factor that contributes to the recurrence of acute cholecystitis.

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