

ACS COT Residents Trauma Papers Competition Title Page

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Frail Geriatric Patients with Acute Calculous Cholecystitis: Operative vs. Nonoperative Management?

Introduction

Acute calculous cholecystitis [ACC] is a common cause of acute abdomen in emergency care units in the United States, representing a lifetime prevalence between 1-4%. Cholecystectomy has been the gold standard treatment for cholecystitis for over a century, with a major advance made in the 1990s, with the advent of the minimally invasive laparoscopic approach instead of the more conventional open one.

Although generally well tolerated, cholecystectomy remains a major surgical procedure that is associated with postoperative morbidity. The treatment of cholecystitis with an antibiotics-first strategy was historically reserved for patients who cannot undergo surgery or those who were many days into an inflammatory process, presenting with complicated forms of cholecystitis. In cases of ACC, the routine use of antibiotics is controversial.

Frailty is a clinical syndrome of increased vulnerability resulting from the age-associated accumulation of physiologic deficits. Multiple studies have suggested the superiority of frailty as opposed to a patient's chronological age in predicting worse outcomes in surgery. The increased risk compared to the younger and non-frail population has made the decision to proceed with operative intervention a more challenging one, with increased interest in treating patients nonoperatively.

However, the high recurrence of cholecystitis in its uncomplicated or complicated forms following nonoperative management poses the risk of a second, perhaps stronger hit necessitating operation to an even more vulnerable patient. The aim of our study was to examine outcomes of frail geriatric patients with ACC treated with cholecystectomy compared to initial nonoperative management. We hypothesized that nonoperative management is associated with worse outcomes.

Methods

We conducted a 1-year (2017) cohort analysis of the Healthcare Cost and Utilization Project's Nationwide Readmissions Database [NRD]. We included all geriatric (age ≥ 65 years) frail patients admitted with a principal diagnosis of acute calculous cholecystitis. Frailty was assessed using the 5-factor modified frailty index [mFI]. The mFI is based on a score where one point is given for each of the following comorbid diagnoses present: hypertension requiring treatment, diabetes mellitus, chronic obstructive pulmonary disease, congestive heart failure, and non-independent functional status. The mFI is then obtained by dividing the calculated score by five. Frail status was defined as any patient with an mFI ≥ 0.4 . We excluded patients

admitted on an elective basis. Patients who expired during their index admission without evidence of operative intervention were also excluded. Frail geriatric patients admitted with a principal diagnosis of ACC were stratified based on the management approach during their index admission: patients undergoing cholecystectomy defined as operative intervention [OP] vs. patients without evidence of operative intervention [NOP]. The primary outcome measures were procedure-related complications in the OP group and 6-month failure of NOP (readmission with cholecystitis). The secondary outcomes were mortality and overall hospital length of stay (LOS). To ascertain the effect of NOP on mortality, we performed a multivariate regression analysis while accounting for the following variables: demographics, comorbidities, weekend admission, severity of illness, healthcare coverage, median household income quartile, hospital bed size, and hospital teaching status.

Results

We identified a total of 53,412 geriatric patients with a principal diagnosis of ACC, 27,263 (51.0%) of which were considered frail. Patients were stratified according to the management approach at the index admission: 16,791 (61.6%) underwent operative intervention (cholecystectomy) during the index admission (OP), and 10,472 (38.4%) were managed nonoperatively (NOP). **Figure 1** No significant differences in patient age (76 ± 7 vs. 77 ± 8 years; $p=0.082$) and mFI (0.47 vs. 0.48 ; $p=0.132$) were noted.

Rate of procedure-related complications in the OP group was 9.3%, while rate of 6-month failure of NOP was 18.9%. Median time to failure of NOP management was 36[12-78] days. Mortality was significantly higher in the frail NOP group (5.2% vs. 3.2%; $p<0.001$). Patients in the NOP group had a significantly greater number of hospitalized days (8[4-15] vs. 5[3-10]; $p<0.001$). NOP was independently associated with increased mortality (OR 1.7[1.4-2.0]; $p<0.001$).

Conclusion

Operative management of frail geriatric patients presenting with ACC may offer better outcomes than NOP. One in five patients failed NOP and subsequently had complicated hospital stays. Early cholecystectomy offers the evident advantage of complete and long-term resolution of ACC and related symptoms in this vulnerable population.

