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Open Cholecystostomy Under Local Anesthesia: A Case Report.

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Abstract:
Background: *More than 6% of elderly patients will develop severe acute cholecystitis.*
Case presentation: *We report a 91-year old male who appeared in the emergency department with diffuse abdominal pain associated with fever and vomiting. Clinical examination, laboratory tests, and imaging modalities confirmed the diagnosis of grade III acute cholecystitis. A percutaneous cholecystostomy under ultrasound guidance was performed. However, after seven days, the patient's condition aggravated, and soon he became septic. Due to the patient's poor general condition and comorbidity, an open cholecystostomy under local anesthesia was carried out.*
Conclusion: *In elderly patients with acute cholecystitis, the treatment options are based on the severity of the disease and the patient's physical condition. Cholecystostomy can be achieved percutaneously (first option), endoscopically (more demanding alternative), or surgically. If need be, cholecystostomy under local anesthesia is feasible and lifesaving, but further investigation is needed.*
Keywords: *Severe acute cholecystitis; Grade III acute cholecystitis; Percutaneous cholecystostomy; Endoscopic cholecystostomy; Open cholecystostomy.*

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I. Introduction

According to the World Health Organization, life expectancy in Greece is 81.5 years. Given the increased incidence of cholelithiasis with age, acute cholecystitis is one of the most common emergency surgical diseases. Older people are at higher risk of developing an episode of acute cholecystitis, and more than 6% of these cases will develop severe acute cholecystitis [1].

In elderly patients with grade II-III acute cholecystitis, there are two therapeutic options. The first one is early laparoscopic cholecystectomy if the patient is a suitable candidate for surgical operation: Charlson Comorbidity Index (CCI) ≤5, American Society of Anesthesiologists Physical Status classification (ASA-PS) ≤2, and lack of jaundice, neurological dysfunction, and respiratory dysfunction. Otherwise, early/urgent biliary drainage followed by delayed laparoscopic cholecystectomy is a safe alternative [2]. Cholecystostomy can be performed percutaneously, endoscopically, or surgically [3, 4].

II. Case Report

A 91-year-old male visited the emergency department with a history of abdominal pain localized in the right hypochondrium the previous three days. The pain was described as acute and constant, and it was associated with fever and vomiting. According to his past medical history, the patient suffered from diabetes, hypertension, chronic obstructive pulmonary disease, and benign prostatic hyperplasia, all under treatment. A pacemaker was also installed ten years ago.

Abdominal examination disclosed rebound tenderness in the right hypochondrium and a positive Murphy sign. His vital signs were as follow: Θ = 38.7 °C, beats 81 / minute, breaths 18 / minute, blood pressure 100/60 mmHg. Oxygen saturation was 91% with nasal oxygen delivery at 4 lt / min, while the PaO2 / FiO2 ratio was 270.

Laboratory studies revealed elevated inflammation markers (WBC 17000/μl, NEUT 85.2%, and CRP 458 mg/L), urea (118 mg/dl), creatinine (2.2 mg/dl) as well as hyponatremia (Na 118 meq / l). Abdominal ultrasound showed a hydropic gallbladder 11 x 5.7 cm with stratification of the thickened wall (6mm), sedimentary contents, pericholecystic fluid, and a slight increase in the vascularity of the wall.

The patient was admitted to the surgical department for hydration and antibiotics, particularly meropenem and metronidazole. The next day an urgent computed tomography of the abdomen was obtained as the patient's condition deteriorated. Radiological findings confirmed acute cholecystitis grade III diagnosis, and a percutaneous cholecystostomy was performed under ultrasound guidance. In the following days, symptoms were alleviated, and the patient recovered.

However, his health degenerated quickly on the 7th day of hospitalization, and the patient became septic. Computed tomography of the abdomen revealed pleural effusions, hydropic and swollen gallbladder, and free fluid in the right paracolic gutter, between bowel loops, and Douglas's pouch. The percutaneous cholecystostomy tube was no more inside the gallbladder, but it was folded along its wall. A cholecystectomy was carried out under local anaesthesia due to the patient's poor general condition and comorbidity. The decision was taken after close consultation with interventional radiologists and anesthesiologists.

Although the patient recuperated well from his operation, he experienced a sharp drop in the level of consciousness six days later. In a short time, he responded only to the application of painful stimuli. Computed tomography of the brain disclosed marked atrophy and scattered micro ischemic lesions. Even though neurologists recommended intubation, his relatives refused, and the patient died the following day.

III. Discussion

Cholelithiasis is the presence of gallstones in the gallbladder. It is estimated that 10-20% of adults in the United States of America have gallstones, while the prevalence of cholelithiasis in Europe is similar, but it seems to be lower in Asia and Africa [5, 6]. Less than half of patients with gallstones will become symptomatic eventually with an annual incidence of 1-3% [7].

Acute cholecystitis could be the first manifestation of the disease in about 10-15% of cases. It is mainly caused by the obstruction of the cystic duct from gallstones. Calculous cholecystitis accounts for 90% of all cases, while 10% represent acalculous cholecystitis [6]. Older people are at higher risk of developing an episode of acute cholecystitis, and more than 6% of these cases develop severe acute cholecystitis [1].

The severity of acute cholecystitis is classified as Grade I (mild), Grade II (moderate), and Grade III (severe) according to Tokyo Guidelines 2018. Patients should also be evaluated for existing comorbidity and physical condition. CCI and ASA-PS scores are used to assess whether a patient can undergo a surgical operation or not [10]. For grade I-II acute cholecystitis, if the patients meet the criteria of CCI≤5 and ASA-PS≤2, early laparoscopic cholecystectomy is recommended. For grade III acute cholecystitis, if the patients meet the criteria of CCI≤5 and ASA-PS≤2 and lack negative predictive factors (jaundice, neurological dysfunction, respiratory dysfunction), early laparoscopic cholecystectomy is indicated. Otherwise, early/urgent biliary drainage followed by delayed laparoscopic cholecystectomy once the patients' condition has improved is considered a safe alternative. It is worth noting that early laparoscopic cholecystectomy in grade II-III acute cholecystitis should be performed by experienced surgeons [2].

In elderly patients with Grade II or III acute cholecystitis who are not eligible for surgical treatment, cholecystostomy is the first step towards stabilizing patients to reduce morbidity and mortality [2, 9, 10]. The next step is the administration of intravenous fluids and broad-spectrum antibiotics. The question that arises is when it is the ideal time for laparoscopic cholecystectomy. It seems that early cholecystectomy at the same admission reduces readmission rates in elderly patients and is associated with lower overall healthcare costs [2, 11, 12].

There are three ways to perform gallbladder drainage: percutaneous ultrasound-guided transhepatic, endoscopic ultrasound-guided transmural, and open cholecystostomy [3, 4]. Percutaneous ultrasound-guided transhepatic cholecystostomy should be the first alternative in patients at high surgical risk as it is simple to perform, less invasive, and with lower complications than open cholecystostomy [3, 13]. Endoscopic ultrasound-guided transmural cholecystostomy is equal to percutaneous as regards success rate and adverse events. However, it is a technically challenging procedure that can be performed only by skilled pancreaticobiliary endoscopists from high-volume centres [4, 14]. Even though cholecystostomy is a life-saving intervention, it can increase morbidity during the recovery period. The most common complications are choledocholithiasis at 44%, tube displacement at 27%, and abscess formation at 23% [15]. In our case, the initial

percutaneous cholecystostomy probably moved out of place, and there was no possibility of a new attempt. Therefore, an open cholecystostomy under local anesthesia was considered inevitable.

IV. Conclusion

In elderly patients with acute cholecystitis, the treatment options are based on the severity of the disease and the patient's physical condition. In the case of grade I-II acute cholecystitis, if patients are at low operative risk (CCI≤5 and ASA-PS≤2), early laparoscopic cholecystectomy can be carried out safely. In the event of grade III cholecystitis, if patients are eligible for surgery (CCI≤5 and ASA-PS≤2) without negative predictive factors (jaundice, neurological dysfunction, respiratory dysfunction), early laparoscopic cholecystectomy is indicated. For high-risk patients (CCI≥5, ASA-PS≥2, jaundice, neurological dysfunction, and respiratory dysfunction) with grade II-III acute cholecystitis, early/urgent gallbladder drainage is recommended. Percutaneous ultrasound-guided transhepatic cholecystostomy is the first alternative for high-risk patients because it is simple and safe, whereas endoscopic ultrasound-guided transmural cholecystostomy is demanding. If need be, cholecystostomy under local anesthesia is feasible and life-saving, but further investigation is needed.

Abbreviation:
ASA-PS:American Society of Anesthesiologists Physical Status classification
CCI: Charlson Comorbidity Index

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1. Tepelenis N: Study conception and design, drafting of manuscript.
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3. Stefanou SK: Literature search and acquisition of data.
4. Stefanou CK: Literature search and acquisition of data.
5. Kefala MA: Analysis and interpretation of data.
6. Paxinos AK: Analysis and interpretation of data.
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