

Enormous Gallstone Discovered in the Setting of Acute-on-chronic Cholecystitis

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Abstract

Biliary disease is a common surgical problem. A unique case of a 53-year-old male with an enormous gallstone precluding safe laparoscopic cholecystectomy is presented. The patient was a 53-year-old male who presented to the emergency department with a 1-day history of abdominal pain for which clinical findings were consistent with acute cholecystitis. A laparoscopic cholecystectomy was attempted, but could not be safely completed due to an enormous gallstone prohibiting attainment of the critical view of safety. The stone measured 12.2 cm x 5.2 cm x 5.2 cm. Although biliary disease is very common and its management well documented, it is rare to uncover stones larger than 5 centimeters in diameter. Clinicians should be aware that enormous gallstones require prompt surgical intervention if discovered in the elective setting to minimize future morbidity should cholecystitis develop; early elective cholecystectomy should be considered upon discovery of large gallstones to prevent encountering a gallbladder with decreased mobilization in the setting of inflamed tissues.

Keywords

Cholecystitis, enormous gallstone, critical view of safety

Introduction

Gallbladder disease, including cholelithiasis, is a problem frequently encountered by physicians and surgeons in the United States, including Hawai'i. It is paramount that physicians in Hawai'i be aware that many variations of gallbladder disease exist, including patients with enormous gallstones. A case study is presented that involves a patient from the Pacific Islands with an enormous gallstone that required a unique surgical approach. This patient encounter can be utilized to treat patients more effectively in Hawai'i and the United States that have similar pathology.

Case Description

The patient was a 53-year-old male with no significant past medical or surgical history who presented with 1-day duration of colicky right upper quadrant abdominal pain associated with nausea, vomiting, and anorexia. He was afebrile and hemodynamically stable. Abdominal examination revealed mild distension, moderate right upper quadrant tenderness, and a palpable gallbladder upon deep palpation. The patient displayed a positive Murphy's sign. Laboratory evaluation revealed leukocytosis (WBCs: 19000), as well as elevated AST (167), ALT (122), ALP (334); total bilirubin was within normal limits (1.1).

Notably, the patient had presented with acute abdominal pain to an outside hospital 1 week prior, at which time an abdominal CT scan demonstrated a large gallstone within the gallbladder without evidence of acute cholecystitis (Figure 1). At the time of initial presentation, outpatient follow-up was recommended.

A diagnosis of cholecystitis was discussed with the patient and he was consented for a laparoscopic cholecystectomy acknowledging an increased likelihood of converting to an open procedure due to the size of his gallstone. The procedure began laparoscopically, which allowed for lysis of dense adhesions and medial and lateral dissection of the gallbladder. After progressing to the hepatocystic triangle, the critical view of safety could not be achieved due to the severe inflammation as well as limited gallbladder mobility because of the enormous stone. As such, the procedure was converted to an open cholecystectomy. A subtotal fenestrating cholecystectomy was performed, with a small area of infundibulum cauterized and left in situ, as it was densely adherent to the common bile duct. Final pathology revealed a fibrotic gallbladder with thickened walls and evidence of acute cholecystitis, as well as a single, irregular, 185-gram gallstone measuring 12.2 cm x 5.2 cm x 5.2 cm (Figure 2).

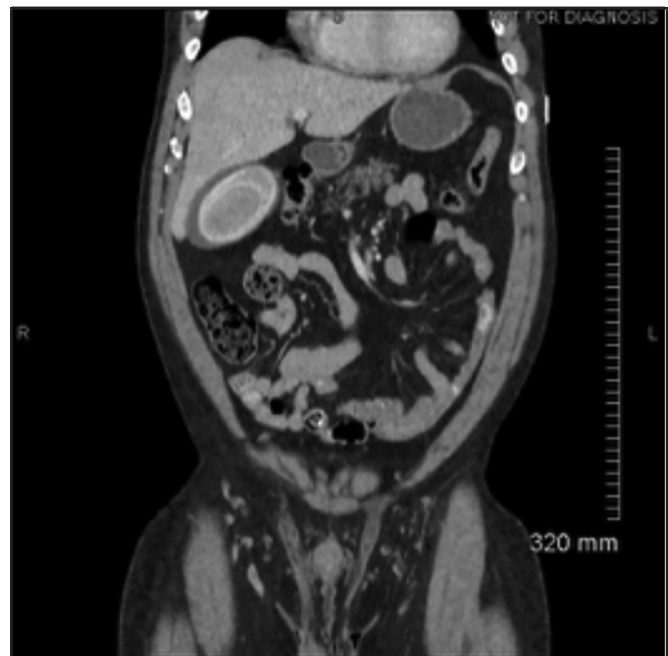


Figure 1. Abdominal CT Reveals an Enormous Gallstone



Figure 2. Single Enormous Gallstone

The patient had an uneventful post-operative course. There was no evidence of bile leak, and his right upper quadrant drain was removed on post-operative day 2. He was discharged on post-operative day 3.

Discussion

The incidence of gallstones is estimated to be 1 in 200 people each year, with 1%-4% annually progressing to various biliary pathologies including biliary colic, cholecystitis, or choledocholithiasis.^{1,2} As the population continues to age and rates of obesity rise, the incidence is anticipated to increase.³ Allowing a period of “cooling off” for the gallbladder was once a tenant of gallbladder surgery. Although there is still variation in presentation and a significant role for surgeon decision-making, recent studies have shown improved outcomes for early intervention. A 2011 paper by Banz et al demonstrated that delayed laparoscopic cholecystectomy (occurring after 48 hours from hospital admission) resulted in significantly increased postoperative complications, longer postoperative hospital stay, and higher conversion/re-operation rates.⁴

Laparoscopic cholecystectomy was first performed by Dr. Mühe in 1985 and is now one of the most commonly performed procedures in the United States, with approximately 300 000 cholecystectomies performed annually.^{5,6} A laparoscopic approach to gallbladder disease is associated with less post-operative morbidity (including lower pneumonia and wound infection rates), lower mortality, and shorter hospital stays.² Interestingly, a meta-analysis of open and laparoscopic cholecystectomy did not show a significant difference between the 2 types of procedures in rates of bile leakage, intraoperative blood loss, or operative times.² Laparoscopy is considered standard of care and should be attempted when safe. However, obtaining the critical view of safety is a mandatory component of the procedure and is aimed at preventing serious injury.^{7,8} This requires clearing

the hepatocystic triangle of fat and fibrous tissue, exposing the cystic plate, and identifying 2, and only 2, structures that enter the gallbladder.⁹ Failure to obtain a critical view of safety prompts serious consideration for an alternative operative approach, such as subtotal cholecystectomy or conversion to open cholecystectomy.⁸

The rate of conversion from laparoscopic cholecystectomy to open cholecystectomy is estimated to be between 3% and 30%, with most studies estimating rates of 2%-5%. The rate of conversion is believed to be higher when performed for acute cholecystitis.^{2,10-12} The most common reason for conversion is difficult dissection of Calot’s triangle.¹³ Multiple studies have identified risk factors for conversion to an open cholecystectomy. Patient factors associated with higher rates of conversion to open cholecystectomy include: elevated BMI, hypertension, diabetes, prior abdominal surgery, duration of symptoms greater than 72 hours, gallbladder wall thickness greater than 4 mm, presence of choledocholithiasis, and impacted stone at the gallbladder neck.¹³⁻¹⁶ Large gallstones may lead to inflammation and wall thickening, which not only makes it difficult for the surgeon to grasp the gallbladder and provide necessary anatomic exposure,¹⁷ but also obscures visualization and makes dissection planes more difficult to identify.

Gallstones exceeding 5 cm are rare occurrences.¹⁰ Two case reports have described gallstones between 6 and 9.5 cm.^{10,17} Although Xu et al¹⁰ reported that a laparoscopic approach was possible with a 9.5 centimeter gallstone, the size of the current patient’s gallstone and the severe inflammation made completion of the operation laparoscopically a dangerous endeavor. Although the size of the gallstone itself may not prohibit completion of cholecystectomy laparoscopically, when performed in the setting of inflammation, obtaining the critical view becomes even more difficult. Patients discovered to have large gallstones should be referred for early elective surgical intervention to prevent future complications and difficulties. Intervention in the elective setting was emphasized in a case report by Freeman et al¹ that involved an incidentally discovered 4.5-cm gallstone that resulted in gallstone ileus 9 months after discovery. Additionally, large gallstones have been shown to increase the risk of developing gallbladder cancer.¹⁸ Rates of adenocarcinoma among patients with gallstones larger than 3 cm have been estimated to be as high as 4% at 20 years after discovery, which translates to a relative risk of adenocarcinoma development of 10.1.¹⁹ Therefore, it is recommended to perform elective surgery for appropriate patients who have gallstones larger than 3 cm.

This case not only describes one of the largest gallstones in medical literature, but also serves to endorse early cholecystectomy when enormous gallstones are discovered. If identified in the acute setting, consideration for an alternative approach is necessary.

Conclusion

A case of acute cholecystitis in a 53-year-old male found to have a single 185-gram gallstone measuring 12.2 cm x 5.2 cm x 5.2 cm requiring treatment with a laparoscopic converted to open subtotal cholecystectomy is presented. Clinicians must be aware that enormous gallstones exist and require prompt and sometimes alternative interventions for remediation of disease.

Lessons to Be Learned

Obtaining the “critical view of safety” is a mandatory component of laparoscopic cholecystectomy. Should this not be achieved due to inflammation, anatomy, or an enormous gallstone, an alternative approach should be utilized. To prevent morbidity, early elective cholecystectomy should be recommended when enormous gallstones are identified.

Conflict of Interest

None of the authors identify a conflict of interest.

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