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Case Report

Acute Calculous Cholecystitis in A Gallbladder Packed with Myriad of Gallstones

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ABSTRACT

Background: Acute calculous cholecystitis usually occurs when one or a more gallstones are found in the gall bladder, symptoms occur when stones occlude the neck of the gall bladder or neck- cystic duct junction, in most of the cases one or just a few gall stones are observed. In rare instances Gall bladder becomes completely filled with stones. (1,16) Such a "stone packed" gallbladder can be difficult to manage laparoscopically and may act as a reservoir for choledocholithiasis, gallstone pancreatitis and stone spillage related complications during extraction. (2–3,6–8,13–16)

Case Presentation: A 36-year-old woman presented with one week of right upper quadrant pain and a history of a similar, conservatively managed episode of acute calculous cholecystitis two months earlier. She had right hypochondriac region tenderness and a positive Murphy's sign, but no fever or jaundice and normal liver function tests except elevated alkaline phosphatase levels. CT and MRCP showed a grossly distended gallbladder packed with innumerable 3–4 mm calculi, diffuse wall thickening and minimal pericholecystic fat stranding, with normal calibre bile ducts and no common bile duct (CBD) stone. She underwent laparoscopic adhesiolysis and cholecystectomy; intra operatively the gallbladder was tense, thick walled and filled with multiple small stones and sludge, but was removed laparoscopically using a retrieval bag without stone spillage. Her postoperative course was uneventful.

Discussion: This case shows that even in a young woman, the gallbladder can be literally brimful of tiny stones and still present as "standard" acute cholecystitis. The report discusses how extreme stone burden might increase the risk of CBD stones and gallstone pancreatitis, how to categorize patients for ERCP using current guidelines, and the duration and interval of cholecystectomy.(2–5,7–9) It also highlights practical points around specimen retrieval in a stone packed gallbladder—use of endobags, controlled port site dilation and meticulous management of any stone spillage—to reduce the risk of omental abscess, peritonitis and late re operations.(13–15)

Conclusion: Gallbladders packed with hundreds of tiny stones can still present like routine acute calculous cholecystitis, but carry a higher risk of CBD stone migration, gallstone pancreatitis and other stone related complications if not addressed.(2–4,7–9,13–16) In heavily stone loaded gallbladders, careful attention to cystic duct anatomy, gentle handling and secure, bagged specimen retrieval, combined with appropriate postoperative monitoring for obstructive jaundice or pancreatitis and timely use of ERCP when indicated, can significantly reduce the risk of retained or slipped stones and their consequences.(2–5,7–9,10–12,13–15).

Keywords*:* Acute calculous cholecystitis; stone packed gallbladder; microlithiasis; choledocholithiasis; obstructive jaundice; gallstone pancreatitis; retained CBD stone; ERCP; stone spillage; endobag; omental abscess.

INTRODUCTION

Acute calculous cholecystitis is usually triggered by a gallstone obstructing the cystic duct, causing gallbladder distension, mucosal ischemia and secondary bacterial inflammation.(1) Most patients have a limited number of stones, but some have a gallbladder literally filled with small calculi and sludge.(1,16) This extreme stone burden is more than just a radiological curiosity: it may be associated with recurrent biliary colic, acute cholecystitis, and migration of stones into the CBD with obstructive jaundice, cholangitis or pancreatitis.(2–4,7–9)

In symptomatic gallstone disease, concomitant CBD stones are reported in roughly 10–20% of patients.(3,4) Gallstones are also one of the leading causes of acute pancreatitis worldwide, responsible for around one-third to almost half of cases in many series.(7,8) Current guidelines recommend categorizing patients by their probability of choledocholithiasis based on liver function tests, clinical features (such as jaundice and cholangitis) and imaging, and then selecting MRCP, EUS or ERCP accordingly.(3,5)

At the same time, a gallbladder that is tense, inflamed and full of stones is technically challenging during laparoscopic cholecystectomy. These gallbladders are more prone to perforation and stone spillage, which in turn may lead to omental abscesses, subphrenic collections, abdominal wall sinuses or even peritonitis if stones are left behind. (1,13,14)

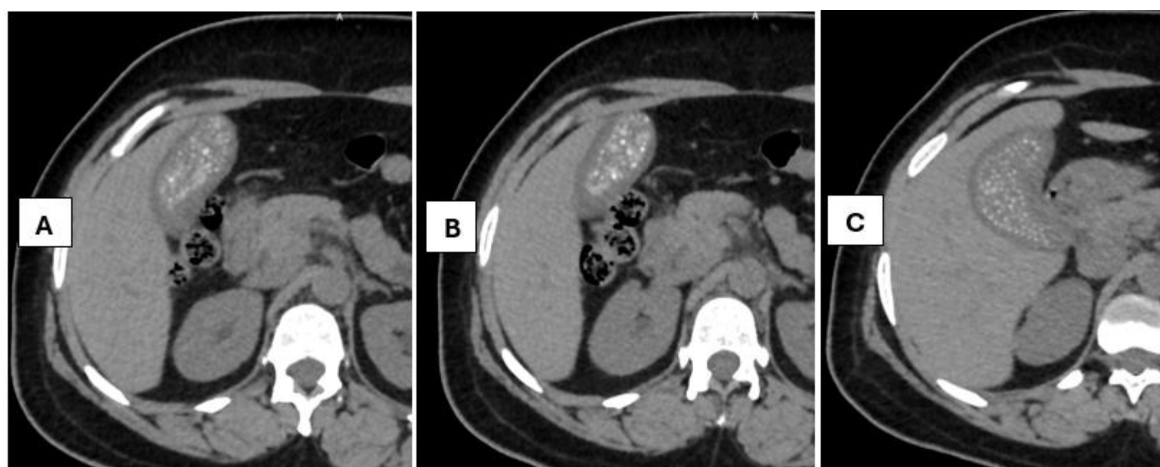
This case describes a young woman with acute severe calculous cholecystitis, in whom CT and MRCP showed a grossly distended gallbladder packed with 3–4 mm stones but no CBD stone. Using this case, the article looks at how such extreme stone burden relates to CBD stones and gallstone pancreatitis, and outlines simple, practical steps during laparoscopic cholecystectomy to reduce stone spillage and its complications.

CASE REPORT:

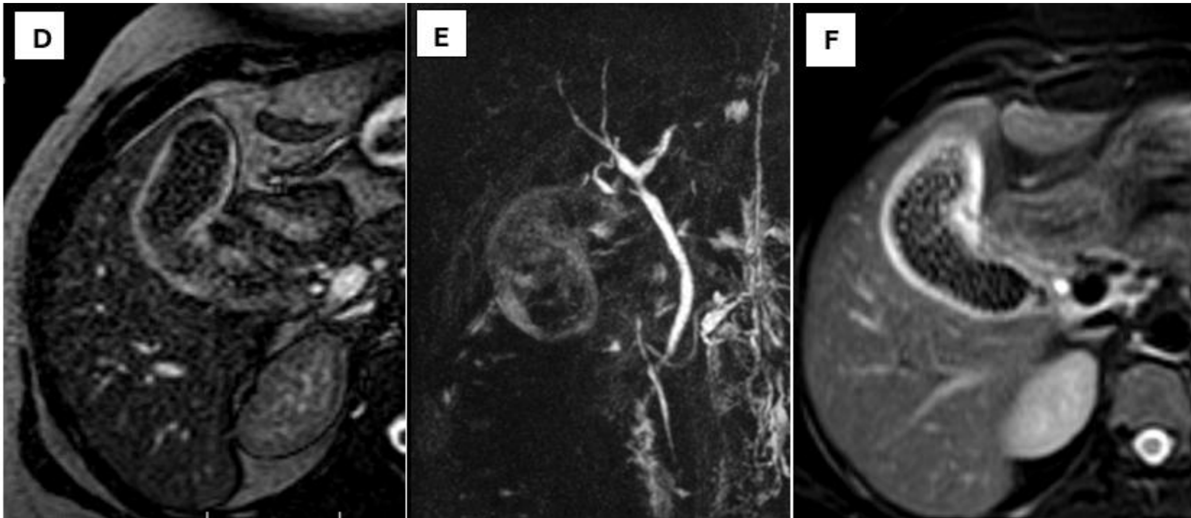
A 36-year-old woman presented with one week of upper abdominal pain, predominantly in the right hypochondrium. Two months earlier she had a similar episode, was diagnosed with acute calculous cholecystitis and managed conservatively. This time there was no history of fever, vomiting, loose stools, jaundice, pruritus or dark urine.

On examination, she was afebrile and haemodynamically stable. Abdominal examination revealed right hypochondrial tenderness, rebound tenderness and a positive Murphy’s sign, with no palpable mass and no clinical icterus. Laboratory tests showed leukocytosis (total count 12,320 cells/mcL) with otherwise normal biochemistry and liver function tests except elevated alkaline phosphatase levels.

CT abdomen revealed a distended gallbladder containing numerous tiny calculi, the largest measuring around 3 mm, with wall thickening of about 6 mm and subtle pericholecystic fat stranding; the intra- and extrahepatic bile ducts were not dilated. MRCP confirmed a grossly distended gallbladder packed with multiple 3–4 mm stones, diffuse wall thickening up to ~7 mm and minimal pericholecystic changes. The cystic duct, common hepatic duct and CBD were normal in calibre, with no intraductal calculus, stricture or mass, and there was no evidence of choledocholithiasis.



Images (A-C)-Showing distended, thick walled Gall baldder with numerous tiny calculi



Images (D-F)- MRCP showing grossly distended Gall bladder filled with tiny calculi. No evidence of IHBR/CBD dilatation. No Intraductal calculus

The patient underwent laparoscopic adhesiolysis and cholecystectomy the following day. The gallbladder appeared tense, thick-walled and porcelain-like, with multiple small stones and sludge within the lumen.

The specimen was placed in a retrieval bag and brought out through the epigastric port; the port site was slightly dilated to allow removal without tearing the bag. The calculi were meticulously removed with adequate precautions around the port site and intra-abdominally under vision to monitor any spillage and prompt retrieval of any spilled calculus. The specimen was cut open and a myriad of calculi completely packed inside the gallbladder was present. Histopathology showed acute on chronic calculus cholecystitis.

Image –G- Showing Inflamed gall bladder with multiple tiny pigment stones

The patient recovered well. Repeat liver function tests remained within normal limits and there were no features to suggest CBD obstruction or pancreatitis. She was discharged on postoperative day two with advice on wound care and a scheduled follow-up visit.

DISCUSSION:

In this case reported above, the patient's gallbladder was not just "multiple calculi"; it was entirely filled with tiny 3–4 mm calculi, to the point that the lumen was almost completely occupied on CT and MRCP. Case reports have described similarly extreme stone burdens, including a report where 425 gallstones were removed at laparoscopic cholecystectomy.(16) These heavily stone-loaded gallbladders are likely the end result of long-standing lithogenic bile and recurrent low-grade inflammation, even when the patient is young and apparently fit.(1,16)

Clinically, however, the presentation was that of "classical" acute calculous cholecystitis—right upper quadrant pain, Murphy's sign and leukocytosis, without jaundice or cholangitis.(1) It should be remembered that even extreme cases can

present in the familiar way of simple cholecystitis. This also creates an opportunity to ask what additional risks such a stone reservoir carries, particularly in terms of CBD stones and pancreatitis.

In symptomatic gallstone disease, concomitant CBD stones are seen in roughly 10–20% of patients, with higher prevalence in older patients and in those with jaundice, abnormal liver tests or a dilated CBD on imaging. (3,4) Choledocholithiasis can cause obstructive jaundice, cholangitis and pancreatitis, and its timely recognition is crucial.(2,3,7–9)

Current ASGE-style algorithms classify patients into low, intermediate or high probability of CBD stones based on bilirubin, ductal dilatation, visible stones on imaging, and clinical cholangitis.(3,5) High-risk patients go straight to therapeutic ERCP, whereas intermediate-risk patients typically undergo MRCP or EUS first and low-risk patients proceed directly to laparoscopic cholecystectomy.(3,5) ERCP is a powerful tool but carries a 6–15% complication rate, mainly due to pancreatitis, bleeding and perforation, so avoiding unnecessary procedures is important.(5)

In this case, the absence of jaundice, normal liver function tests and non-dilated ducts placed the patient firmly in a low-risk group. (2,3) MRCP then provided additional reassurance by demonstrating a normal CBD and no intraductal stones. This allowed a single-stage strategy—laparoscopic cholecystectomy.

Gallstones are one of the most common causes of acute pancreatitis worldwide, accounting for about 35–40% of cases in many series.(7,8) The usual mechanism is a small stone or sludge migrating from the gallbladder into the distal CBD and becoming transiently impacted at, or just above, the ampulla of Vater.(8) This short-lived obstruction is enough to raise pancreatic duct pressure and trigger premature activation of pancreatic enzymes within the gland, leading to autodigestion and the inflammatory cascade of acute pancreatitis.(7,8)

In the case described above, with a gallbladder densely packed with tiny stones, the potential for such migration is obvious: each small calculus is the right size to slip into the CBD and reach the ampulla. The fact that the patient did not present with gallstone pancreatitis may simply reflect chance and timing rather than low risk. Studies of acute biliary pancreatitis consistently show that early cholecystectomy, either during the initial admission or soon after recovery, reduces the risk of recurrent attacks. (7,9) Delaying cholecystectomy after a first episode of gallstone pancreatitis is associated with higher recurrence rates, and some patients experience recurrent pancreatitis even years after the initial event if the gallbladder is left in situ. (9)

Even when preoperative imaging is normal, unexpected retained CBD stones can still appear after cholecystectomy, although this is relatively uncommon. Reported rates of clinically significant retained stones are in the range of 0.5–2% of cholecystectomies, depending on how aggressively patients are screened. These patients usually present weeks to years later with recurrent biliary colic, jaundice, cholangitis or pancreatitis. (10–12)

ERCP with sphincterotomy and stone extraction is the standard treatment for retained stones and is highly effective when performed in experienced hands.(3,8,12) From a practical standpoint, in a patient where the gallbladder is completely packed with stones, it is worth documenting that any postoperative development of jaundice, cholangitis or pancreatitis should prompt imaging (ultrasound and/or MRCP) and consideration of ERCP, even though initial imaging was negative.(2,3,7–9,12)

Tense, inflamed gallbladder filled with stones are more prone to perforation during dissection and extraction. Gallbladder perforation and stone spillage are reported in 8–30% of laparoscopic cholecystectomies, although most spilled stones remain clinically silent. (13) Still, a significant body of literature describes serious complications from retained stones, including omental and perihepatic abscesses, subphrenic collections, abdominal wall sinuses and, less commonly, early postoperative peritonitis.(13,14)

Routine use of a retrieval bag (endo-bag, glove or improvised sterile bag) during specimen extraction helps contain bile and stones and reduces contamination of the port tract.(15) Comparative studies suggest that bagged retrieval is associated with fewer port-site infections and fewer port-site stone implants, at the cost of only a small increase in operative time.(15) In a stone-packed gallbladder, practical modifications include double-bagging when the gallbladder wall is friable, controlled dilation or a small extension of the epigastric port rather than forceful pulling on the bag, and, where feasible, partial decompression of the gallbladder before extraction.(13,15)

If the gallbladder does perforate and stones and bile are spilled, the safest approach is to pause, suction bile, irrigate with normal saline generously and retrieve all the spilled stones before proceeding with surgery.(13,14) The operative note should document the occurrence and management of spillage so that any later occurrence of abscess or atypical collection is interpreted in that context.(13,14)

Most lost stones will never cause trouble, but the cases that do can be dramatic. Reports describe omental or perihepatic abscesses, subphrenic collections, abdominal wall and port-site abscesses, and fistulae related to a single retained stone

acting as a focus.(13,14) Some patients present early with postoperative peritonitis due to infected spilled stones, requiring relaparotomy, extensive lavage, stone removal and sometimes partial omentectomy.(14) Others present months or years later with atypical collections or even pseudo-tumours mimicking malignancy on imaging.(13)

Such re-operations are not routine. They are associated with longer hospital stay and a higher risk of systemic complications, including respiratory issues like atelectasis and basal consolidation after major laparotomy, which may require mechanical ventilation if the patient has comorbidities and pre-existing conditions that increase the risk for complications, prolonged morbidity and even mortality in extreme cases.(13,14) Prevention of these complications through careful use of retrieval bags, gentle extraction and thorough management of any spillage is preferable to dealing with complications of retained stones later.(13–15)

LEARNING POINTS:

A gallbladder can be completely packed with hundreds of tiny stones and still present as routine acute calculous cholecystitis, and clinically a mass may not be palpable.(1,16) Extreme intra-gallbladder stone burden increases the theoretical risk of choledocholithiasis and gallstone pancreatitis, making timely cholecystectomy particularly important.(2–4,7–9) Risk stratification and the selective use of MRCP/EUS allow ERCP to be reserved for patients with a high probability of CBD stones or positive imaging, limiting exposure to ERCP-related complications.(3–5) In a stone-packed gallbladder, disciplined use of endobags, controlled port-site dilation and meticulous management of any stone spillage are key to avoiding omental abscess, peritonitis and late re-operation.(13–15)

CONCLUSION:

This gallbladder-packed case of acute severe calculous cholecystitis brings several practical messages together. Even when the gallbladder is filled with hundreds of tiny stones, the patient may still walk in with what looks like routine acute cholecystitis, yet the underlying anatomy carries a higher chance of CBD stone migration, gallstone pancreatitis and other stone-related problems if left untreated.(1–4,7–9,13–16) In such patients, it is worth paying close attention to the course and angulation of the cystic duct as it joins the common hepatic duct and CBD, because a wide or sharply angulated cystic duct can make it easier for small stones to slip into the CBD either spontaneously or during manipulation at surgery.(2–4,10) Gentle handling of the infundibulum, avoidance of excessive "milking" towards the duct, and a low threshold for further imaging when suspicion for CBD stones is high can all help reduce the risk of a retained or newly slipped stone.(2–5,10–12)

In this patient, normal liver tests, non-dilated ducts and a clear MRCP allowed a straightforward laparoscopic cholecystectomy without ERCP, and use of a retrieval bag helped avoid visible stone spillage. (2–5,13–15). Any new postoperative jaundice, dark urine, pale stools, biliary colic, cholangitis or pancreatitis should trigger early liver function tests and ultrasound or MRCP, with ERCP considered if a retained or slipped CBD stone is found. (2–5,7–9,10–12)

For surgeons, the key takeaway is to think one step ahead in heavily stone-loaded gallbladders: assess the risk of choledocholithiasis and pancreatitis, use guideline-based risk stratification when deciding on ERCP, and treat both the cystic duct and specimen retrieval as moments where extra care is required.(2–5,7–9,10–12,13–15) For patients, timely cholecystectomy, meticulous operative technique and careful postoperative monitoring can prevent a stone-packed gallbladder from progressing to much more serious problems such as obstructive jaundice, gallstone pancreatitis or peritonitis from retained stones.(2–4,7–9,10–12,13–16)

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