

Acute Calculous Cholecystitis in a Young Male Patient: An Atypical Presentation with Significant Inflammatory Findings

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ABSTRACT

Acute calculous cholecystitis is a common cause of acute abdominal pain; however, it predominantly affects older individuals and females, making its occurrence in young male patients without traditional risk factors relatively uncommon and clinically significant. We report the case of a 23-year-old male with no relevant medical history who presented with a 48-hour history of right upper quadrant abdominal pain associated with nausea, vomiting, and fever. Physical examination revealed a positive Murphy's sign without signs of peritoneal irritation. Laboratory studies demonstrated mild leukocytosis and markedly elevated C-reactive protein, with normal liver function tests and pancreatic enzymes. Abdominal ultrasound confirmed cholelithiasis and significant gallbladder wall thickening (12 mm), consistent with acute cholecystitis. According to Tokyo Guidelines 2018 criteria, the patient met diagnostic and severity parameters suggestive of moderate disease. The patient underwent urgent open cholecystectomy as the primary surgical approach due to intraoperative findings of a tense and distended gallbladder, with an uneventful postoperative course. Histopathological analysis confirmed chronic calculous cholecystitis. This case highlights the importance of recognizing acute cholecystitis in atypical populations such as young male patients, who may present with significant inflammatory changes and require prompt surgical management to prevent complications.

KEYWORDS: Acute calculous cholecystitis, atypical presentation, young male, gallbladder inflammation, case report.

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INTRODUCTION

Acute cholecystitis is a common cause of acute abdominal pain and represents a significant proportion of emergency surgical admissions worldwide. It is primarily caused by obstruction of the cystic duct secondary to gallstones, accounting for approximately 90–95% of cases (1). This obstruction leads to increased intraluminal pressure, gallbladder distension, ischemia, and subsequent inflammatory response, which may progress to severe complications such as perforation, abscess formation, or sepsis if not treated promptly (2).

Gallbladder disease affects millions of individuals globally, with acute cholecystitis diagnosed in approximately 200,000 patients annually in the United States alone (1). Despite its

high prevalence, the condition typically occurs in patients with well-established risk factors, including female sex, obesity, advanced age, and metabolic conditions (3). This classical epidemiological profile is often summarized in clinical practice, contributing to a diagnostic bias toward these populations.

However, the occurrence of acute cholecystitis in young male patients is relatively uncommon and may represent a diagnostic and therapeutic challenge. Interestingly, male sex has been associated with a more severe clinical course and higher risk of complications once acute cholecystitis develops (4). Additionally, atypical demographic presentations may delay diagnosis, increasing the risk of adverse outcomes.

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For this reason, reporting cases in non-classical populations, such as young males without significant comorbidities, is important to broaden clinical awareness and reinforce the need for early recognition and timely surgical management. This case highlights the presentation, diagnostic approach, and surgical management of acute calculous cholecystitis in a young adult male.

CASE PRESENTATION

A 23-year-old male with no significant past medical history presented to the emergency department with a 48-hour history of abdominal pain. The pain began gradually after the ingestion of a copious meal and was initially localized to the right upper quadrant. It progressively intensified and was associated with nausea, multiple episodes of vomiting, and subjective fever. The patient denied jaundice, acholic stools, or dark urine.

On physical examination, the patient was alert, well-hydrated, and hemodynamically stable. No scleral icterus or skin jaundice was observed. Abdominal examination revealed tenderness to palpation in the right upper quadrant, with a positive Murphy's sign. There were no signs of peritoneal irritation such as rebound tenderness or guarding.

Laboratory evaluation revealed mild leukocytosis ($10.9 \times 10^3/\mu\text{L}$) and a markedly elevated C-reactive protein level (94 mg/L), consistent with an acute inflammatory process. Liver function tests, including AST, ALT, alkaline phosphatase, and bilirubin levels, were within normal limits, suggesting the absence of biliary obstruction. Pancreatic enzymes (amylase and lipase) were also within normal range, effectively excluding pancreatitis. Coagulation parameters were normal (Table 1).

Table 1. Laboratory findings on admission.

Parameter	Result	Reference Range
White Blood Cell Count ($\times 10^3/\mu\text{L}$)	10.9	4.5 – 10
Hemoglobin (g/dL)	14.8	13 – 17
Platelets ($\times 10^3/\mu\text{L}$)	321	150 – 400
Prothrombin Time (sec)	14.9	12.5 – 16.5
Partial Thromboplastin Time (sec)	25.8	24.8 – 34.4
INR	1.1	0.8 – 1.3
Glucose (mg/dL)	82	74 – 109
C-Reactive Protein (mg/L)	94	0 – 6
AST (U/L)	27	0 – 40
ALT (U/L)	30	0 – 41
Alkaline Phosphatase (U/L)	77.5	44 – 147
Total Bilirubin (mg/dL)	0.6	0.3 – 1.2
Direct Bilirubin (mg/dL)	0.34	0 – 0.3
Indirect Bilirubin (mg/dL)	0.26	0.2 – 0.8
Amylase (U/L)	47.1	30 – 110
Lipase (U/L)	19.9	0 – 160
Lactate Dehydrogenase (U/L)	220	120 – 300

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Abbreviations: INR: International Normalized Ratio; ALT: alanine aminotransferase; AST: aspartate aminotransferase; ALP: alkaline phosphatase.

Abdominal ultrasound of the hepatobiliary system demonstrated cholelithiasis, with multiple intraluminal

gallstones measuring approximately 5 mm, producing posterior acoustic shadowing (Figure 1). The gallbladder wall was significantly thickened (12 mm), with the presence of a “double wall” or “double rail” sign, consistent with acute cholecystitis (Figure 2).

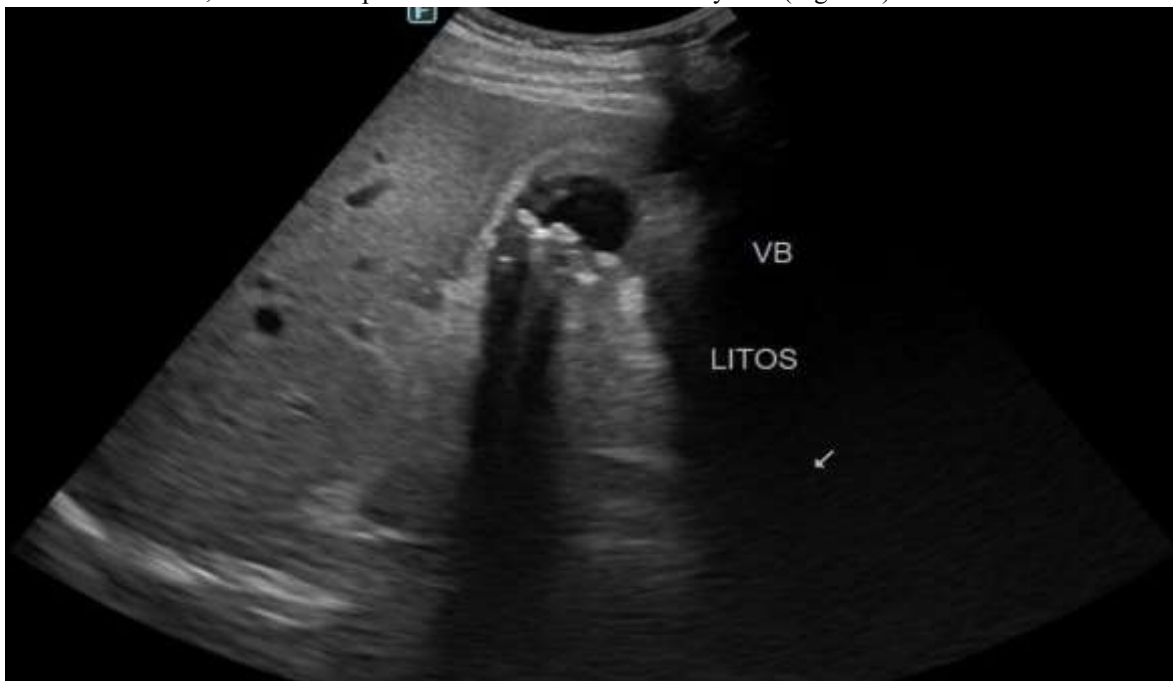


Figure 1. Ultrasound image demonstrating gallbladder wall thickening and the presence of gallstones, consistent with acute calculous cholecystitis.

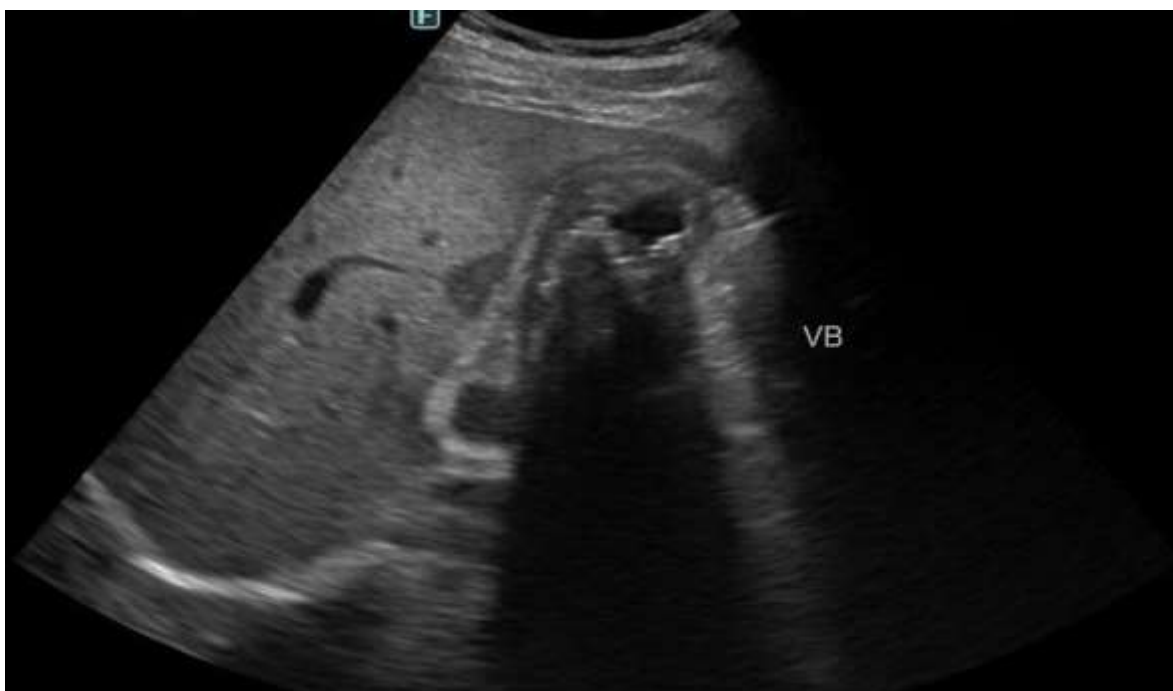


Figure 2. Ultrasound image demonstrating marked gallbladder wall thickening measuring approximately 12 mm, with the characteristic “double wall” (double rail) sign, findings consistent with acute inflammation.

Given the clinical, laboratory, and imaging findings, a diagnosis of acute calculous cholecystitis was established, and the patient was scheduled for urgent surgical intervention.

An open cholecystectomy was performed as the primary surgical approach via a right subcostal (Kocher) incision due to the anticipated severity of inflammation. Intraoperatively,

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a tense and distended gallbladder was identified (Figure 3). Needle decompression was attempted; however, no bile was obtained, suggesting possible obstruction or thickened contents. Careful dissection allowed identification of the cystic duct and cystic artery, which were ligated and divided

in a standard fashion. The gallbladder was subsequently removed without complications (Figure 4).



Figure 3. Intraoperative view of an open cholecystectomy performed through a right subcostal (Kocher) incision, demonstrating a tense and inflamed gallbladder.



Figure 4. Resected gallbladder specimen following cholecystectomy, demonstrating marked wall thickening (11 mm) and the presence of multiple small gallstones.

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The postoperative course was uneventful. The patient received antibiotic therapy and analgesia, with adequate pain control. He tolerated oral intake, passed flatus and stools, and remained afebrile. A surgical drain was placed, with a serous output of approximately 30 mL over 24 hours. The patient was discharged in stable condition due to favorable clinical evolution.

At outpatient follow-up, the patient remained asymptomatic, denying abdominal pain, nausea, vomiting, or fever. He reported normal bowel movements and adequate oral intake. Histopathological examination confirmed chronic calculous cholecystitis, with a gallbladder wall thickness of 11 mm. Surgical sutures were removed without complications.

DISCUSSION

Acute calculous cholecystitis is a well-established clinical entity resulting from cystic duct obstruction, most commonly due to gallstones, leading to gallbladder distension, ischemia, and inflammation. The diagnosis is typically based on a combination of clinical presentation, laboratory findings, and imaging studies, as outlined in the Tokyo Guidelines 2018 (TG18), which remain the cornerstone for diagnosis and severity grading (5). According to TG18 severity grading, the presence of marked gallbladder wall thickening and elevated inflammatory markers in this patient may be suggestive of at least moderate (Grade II) acute cholecystitis, which supports the need for early surgical intervention.

According to TG18, the diagnosis of acute cholecystitis requires local signs of inflammation, systemic signs of inflammation, and imaging findings characteristic of the disease (5). In the present case, the patient fulfilled all diagnostic criteria, including right upper quadrant pain with a positive Murphy's sign, elevated inflammatory markers such as C-reactive protein, and ultrasonographic findings of gallbladder wall thickening and cholelithiasis. Notably, the absence of abnormal liver function tests suggested that there was no associated biliary obstruction, which is consistent with uncomplicated acute cholecystitis (6). According to the Tokyo Guidelines 2018 (TG18) severity grading, the presence of significant gallbladder wall thickening (12 mm) and markedly elevated inflammatory markers in this patient is suggestive of at least moderate (Grade II) acute cholecystitis. This classification is clinically relevant, as it supports the need for early surgical intervention and may predict increased operative difficulty. In this context, the decision to proceed with an open cholecystectomy as the primary approach appears justified, given the intraoperative findings of a tense and distended gallbladder and the potential risk of complications associated with laparoscopic dissection in advanced inflammatory states.

Although acute cholecystitis is more frequently observed in older adults and females, its occurrence in young male patients is relatively uncommon and clinically significant (7).

This atypical demographic presentation may lead to delayed diagnosis due to lower clinical suspicion, especially in patients without traditional risk factors such as obesity, metabolic syndrome, or female sex (8). In this context, the present case highlights the importance of maintaining a high index of suspicion even in non-classical populations.

Interestingly, male sex has been associated with a more severe inflammatory response and worse clinical outcomes in acute cholecystitis (9). Several studies have demonstrated that male patients are more likely to develop complicated cholecystitis, including gangrenous changes, perforation, and increased need for conversion to open surgery (10). This may be attributed to delayed presentation, differences in inflammatory response, or hormonal factors influencing disease progression.

Ultrasound remains the first-line imaging modality for the diagnosis of acute cholecystitis due to its high sensitivity and specificity, as well as its wide availability. Key sonographic findings include gallstones with posterior acoustic shadowing, gallbladder wall thickening greater than 3 mm, pericholecystic fluid, and the sonographic Murphy's sign (11). In this case, the marked wall thickening (12 mm) is particularly notable, as it suggests a more advanced inflammatory process and has been associated with increased surgical difficulty and risk of complications (12).

Early surgical intervention is the gold standard for the management of acute cholecystitis, with laparoscopic cholecystectomy being the preferred approach in most cases (13). However, open cholecystectomy remains an important option in selected scenarios, including severe inflammation, unclear anatomy, or intraoperative difficulty (14). In the present case, an open approach was chosen, likely due to the degree of inflammation and gallbladder distension, which may increase the risk of complications during laparoscopic dissection.

The intraoperative finding of a tense, distended gallbladder without bile drainage upon puncture is consistent with increased intraluminal pressure and possible cystic duct obstruction, further supporting the diagnosis (15). This finding also correlates with the marked wall thickening observed on imaging, reinforcing the presence of advanced inflammation.

Postoperative outcomes in this patient were favorable, with no complications and adequate recovery, which is consistent with evidence suggesting that early surgical management improves clinical outcomes and reduces hospital stay (16). Histopathological findings of chronic calculous cholecystitis further suggest that the patient likely had a subclinical or previously undiagnosed chronic condition that acutely exacerbated.

Overall, this case underscores the importance of recognizing acute cholecystitis in atypical populations, particularly young male patients. Despite being less common, this demographic

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may be associated with more severe disease and requires prompt diagnosis and management to prevent complications. Reporting such cases contributes to increased clinical awareness and may help reduce diagnostic delays in similar scenarios.

CONCLUSION

Acute calculous cholecystitis in young male patients without traditional risk factors represents an atypical but clinically significant presentation that may be associated with substantial inflammatory severity. This case emphasizes the importance of maintaining a high index of suspicion in non-classical populations to avoid diagnostic delays and potential complications. The marked gallbladder wall thickening and elevated inflammatory markers observed highlight the potential for advanced disease even in otherwise healthy individuals. Early diagnosis supported by clinical, laboratory, and imaging findings, combined with timely and individualized surgical management, remains essential for optimal outcomes. Reporting such cases contributes to improved clinical awareness and may support more accurate and timely decision-making in similar scenarios.

“All images are original and were obtained with appropriate patient informed consent.”

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