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Case Report

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Xanthogranulomatous Cholecystitis in a 27-Year-Old Man Without Cholelithiasis: A Radiologic-Pathologic Case Report

Dr. Rafia Shahzad*[1], Dr. Rehma Abdulhameed[2], Dr. Faisal Ehsan Cheema[1], Dr. Zeeshan Rashid Mirza[1], Dr. Arzoo Fatima Saleem[3]

*[1]Consultant, Department of Diagnostic Radiology, AECH INMOL, Lahore, Pakistan.
[2]Medical Officer, Department of Diagnostic Radiology, AECH INMOL, Lahore, Pakistan.
[3]Director, AECH INMOL, Lahore, Pakistan.

***Correspondence:**
Dr. Rafia Shahzad, Consultant Radiologist, Department of Diagnostic Radiology, Atomic Energy Cancer Hospital INMOL, Lahore, Pakistan.

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Abstract

Xanthogranulomatous cholecystitis (XGC) is an uncommon chronic inflammatory disease of the gallbladder that can closely mimic gallbladder carcinoma on clinical assessment and cross-sectional imaging. We report a 27-year-old man with one month of persistent upper abdominal pain, tenderness, intermittent fever and weight loss. Ultrasonography demonstrated marked circumferential gallbladder wall thickening, with intramural nodular/cystic foci and few ring-down artifacts. No gallstones or pericholecystic fluid were identified. Contrast-enhanced computed tomography showed a contracted gallbladder with diffuse wall thickening up to 21 mm, patchy mural enhancement and preserved mucosal enhancement. No radiopaque gallstones, significant pericholecystic fat stranding, biliary dilatation or overt invasive features were present. An inflammatory process was favored because of the patient's young age and the absence of aggressive imaging features. Open cholecystectomy was performed. Histopathology demonstrated transmural inflammation with bile lakes, macrophages, lymphocytes, plasma cells and extensive bile ductular proliferation without malignancy, confirming XGC. This case highlights that XGC should remain in the differential diagnosis of marked gallbladder wall thickening even in young adults without cholelithiasis. Recognition of intramural nodules and preserved mucosal enhancement can increase preoperative confidence for XGC, although histopathologic confirmation remains essential when malignancy cannot be excluded.

Keywords: Xanthogranulomatous Cholecystitis; Gallbladder Carcinoma; Computed Tomography; Ultrasonography; Gallbladder Wall Thickening.

Introduction

Xanthogranulomatous cholecystitis (XGC) is an uncommon destructive inflammatory disease of the gallbladder characterized by mural infiltration by lipid-laden macrophages, mixed inflammatory cells and fibrosis. The inflammatory reaction can extend beyond the gallbladder and produce dense adhesions or mass-like changes that resemble gallbladder carcinoma clinically, radiologically and intraoperatively.[1] The term xanthogranulomatous cholecystitis was introduced by McCoy and colleagues in 1976.[2] XGC is most often reported in middle-aged and older adults and is frequently associated with cholelithiasis, although age distribution and stone prevalence vary among series.[3,4]

For radiologists, the principal diagnostic problem is differentiating XGC from gallbladder carcinoma when marked focal or diffuse wall thickening is present. Intramural hypoechoic or hypoattenuating nodules, diffuse wall thickening and preservation of the enhancing mucosal line are among the imaging features that favor XGC.[5,6] More recent comparative studies show that a continuous mucosal line and intramural hypoattenuating nodules favor XGC, whereas biliary dilatation, destructive invasion of adjacent structures and

suspicious lymphadenopathy increase concern for malignancy.[7,8] Nevertheless, no single imaging finding reliably excludes carcinoma and XGC may coexist with gallbladder carcinoma.[1,4] We report histologically confirmed XGC in a 27-year-old man without demonstrable cholelithiasis, emphasizing radiologic-pathologic correlation and the diagnostic value and limitations of imaging in this unusually young adult.

Case Presentation

A 27-year-old man presented with persistent upper abdominal pain for one month, associated with, intermittent fever and weight loss. Clinical examination revealed mild right upper abdominal tenderness. Rests of the physical examination was unremarkable. Transabdominal ultrasonography demonstrated marked circumferential diffuse thickening of the gallbladder wall, measuring up to 21 mm along the anterior wall. Intramural nodular/cystic foci were seen within the thickened wall with few ring-down artifacts (Figure 1). No gallstones or pericholecystic fluid were identified. Because of the marked mural thickening, further evaluation with computed tomography was recommended to exclude gallbladder carcinoma.

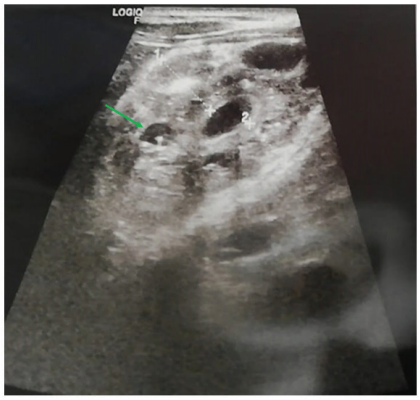

FIGURE 1: Grayscale ultrasound image of the gallbladder demonstrating marked diffuse wall thickening with intramural nodular/cystic foci and ring-down artifacts (Green Arrow). No intraluminal calculi or pericholecystic fluid was identified.

Contrast-enhanced computed tomography of the abdomen demonstrated a contracted gallbladder with diffuse wall thickening, hypoattenuating mural nodules and patchy mural enhancement. The maximal wall thickness was 21 mm along the anterior wall and at the fundus. The mucosal lining remained persistently enhanced (Figure 2). No radiopaque gallstones were present and there was no significant pericholecystic fat stranding. The common bile duct was normal in caliber without a visible radiopaque calculus. No intrahepatic biliary abnormality or focal hepatic parenchymal abnormality was identified. The remaining abdominal organs and visualized vessels were reported as radiologically unremarkable. Given the patient's young age and the absence of overt invasive imaging features, an inflammatory process was favored over gallbladder malignancy.

The patient subsequently underwent open cholecystectomy. Histopathologic examination showed transmural inflammation with bile lakes, macrophages, lymphocytes and plasma cells. Extensive bile ductular proliferation was present. No malignancy was identified. The final diagnosis was xanthogranulomatous cholecystitis.

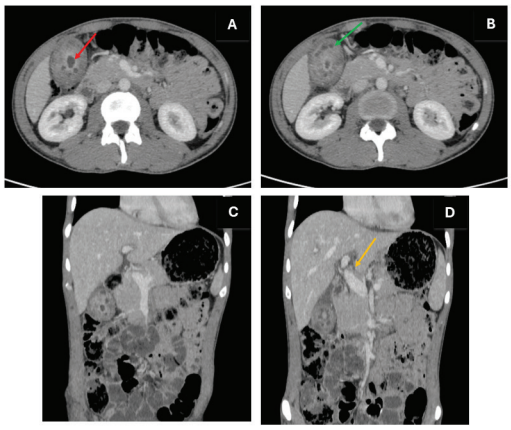

FIGURE 2: Contrast Enhanced Computed Tomography of the abdomen: Axial (A and B) and Coronal (C and D) slices revealed: Contracted gallbladder with diffuse wall thickening, hypoattenuating mural nodules and patchy mural enhancement (Green Arrow).
The mucosal lining remained persistently enhanced (Red Arrow). No radiopaque gallstones and no significant pericholecystic fat stranding appreciated. The common bile duct was normal in caliber (Yellow Arrow) without a visible radiopaque calculus.

Discussion

The present case is unusual mainly because of the patient's age and the absence of demonstrable cholelithiasis. XGC is predominantly described in adults in the fifth to seventh decades of life and gallstones are common, although neither older age nor cholelithiasis is required for the diagnosis.[3,4] Contemporary reports confirm that XGC can occur in much younger patients, including adolescents.[10] Accordingly, age should modify the pretest probability of gallbladder carcinoma but should not exclude XGC when the imaging pattern is otherwise compatible.

The most useful radiologic clue in XGC is the combination of gallbladder wall thickening with intramural nodules. Histologic-radiologic correlation studies have shown that these nodules may represent xanthogranulomas, intramural abscesses or a mixture of both.[5] Preserved luminal surface or mucosal enhancement reflects relative preservation of the epithelial lining.[6] These features are important because gallbladder carcinoma more often disrupts the mucosa and may be associated with biliary obstruction, direct invasion or suspicious lymphadenopathy.[7,8] In the current case, diffuse mural thickening, intramural foci and persistent mucosal enhancement were present, while no intrahepatic biliary dilatation or overt macroscopic hepatic invasion was described.

Recent comparative studies support this pattern. Huang and colleagues found that patients with XGC were younger than patients with gallbladder adenocarcinoma and that an intraluminal mass and lymphadenopathy favored malignancy.[7] In a 2024 CT study, diffuse wall thickening, a continuous mucosal line and intramural hypoattenuating nodules were significantly more frequent in XGC, whereas intrahepatic bile duct dilatation, invasion of adjacent structures and larger lymph nodes favored gallbladder cancer.[8] Earlier multimodality work also showed that imaging can improve diagnostic confidence but cannot reliably exclude carcinoma in every patient.[9] Therefore, the appropriate radiologic conclusion is to raise XGC as a leading differential diagnosis when characteristic features coexist, rather than to declare malignancy excluded.

The ultrasound finding of ring-down artifact in this case deserves cautious interpretation. Comet-tail or ring-down artifact from the gallbladder wall is classically associated with intramural Rokitansky-Aschoff sinuses in adenomyomatosis and is not a defining feature of XGC.[11] In a pathologically confirmed series of 150 patients with comet-tail artifacts, adenomyomatosis and chronic cholecystitis accounted for most cases, while XGC was uncommon.[12] Thus, the description of the intramural foci as cholesterol-filled cysts should not be used as direct evidence of XGC unless supported by pathology. In this patient, the more persuasive XGC features were the marked diffuse wall thickening, intramural nodular change and preserved mucosal enhancement. Histopathology is also the gold standard because XGC can closely resemble gallbladder carcinoma and the two conditions can be present simultaneously.[1,4] Histologic findings in this case, including transmural inflammation, bile lakes, macrophages, lymphocytes, plasma cells and bile ductular proliferation without overt malignancy, are compatible with the inflammatory range of XGC. Because the resected specimen was negative for cancer, this case was diagnosed as XGC.

The definitive treatment of symptomatic XGC is cholecystectomy. Modern reports do not uniformly advocate open cholecystectomy; patients with XGC may be candidates for laparoscopic cholecystectomy if there is minimal inflammation, no dense adhesions or distortion of anatomy and if there is not high suspicion for cancer.[13,14] The high rates of conversion in cases with significant inflammation and distorted anatomy may lead surgeons to opt for an open procedure.[3,13,14] Comprehensive operative planning, tailored for individualized care with advanced disease, is important.[15] The open approach was utilized in this case for surgical resection and histopathologic definitive diagnosis. Pre- and intraoperative diagnosis of XGC may help guide operative planning to avoid more aggressive, unnecessary oncologic resection of the organ, particularly in younger patients when invasive, destructive cancer is excluded by histopathology.[3,13,14]

Conclusion

Consideration of XGC in the differential diagnosis of significant gallbladder wall thickening is indicated in patients of all ages, even younger patients and those without cholelithiasis. Diffuse wall thickening, hypoechoic or hypoattenuating intramural nodules and the presence of an intact enhancing mucosal lining tend to suggest XGC more strongly than gallbladder cancer in patients without an invasive/destructive component or obstruction of the biliary system. Preoperative imaging may strongly suggest differential diagnosis and help plan surgical management, but histopathologic analysis remains essential when malignancy cannot be confidently excluded.

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