

A Sealed-Off Gallbladder Perforation with Cholelithiasis and Underlying Adenocarcinoma: A Rare Case Report

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Abstract: Gallbladder perforation (GBP) is an uncommon but potentially life-threatening complication of acute cholecystitis. It typically occurs due to delayed diagnosis and is associated with high morbidity and mortality. In elderly patients, clinical presentation may be atypical, and in rare instances, GBP may unmask an underlying gallbladder carcinoma. We present the case of a 70-year-old hypertensive female who presented with right upper quadrant abdominal pain and low-grade fever. Imaging with contrast-enhanced computed tomography (CECT) revealed a sealed-off gallbladder perforation, a suspicious soft tissue mass in the gallbladder fundus, and multiple gallstones. She underwent a radical cholecystectomy with liver wedge resection and regional lymphadenectomy. Histopathological examination confirmed moderately differentiated gallbladder adenocarcinoma infiltrating the perimuscular connective tissue, with no serosal involvement and negative lymph nodes. The final staging was pT2aN0M0 (Stage II). This case highlights the need to maintain a high index of suspicion for malignancy in elderly patients presenting with complicated cholecystitis and underscores the importance of early surgical intervention in improving outcomes.

Keywords: Gallbladder Adenocarcinoma, Gallbladder Perforation, Cholelithiasis, Elderly, Radical Cholecystectomy

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I. INTRODUCTION

Gallbladder perforation is an uncommon complication of acute cholecystitis, with an incidence reported between 2–11%. It is more frequently seen in elderly individuals and is often associated with cholelithiasis, infection, and ischemia of the gallbladder wall. Rarely, GBP may occur in the setting of an underlying gallbladder carcinoma. Gallbladder adenocarcinoma is the most prevalent malignancy of the biliary tract and frequently presents at an advanced stage due to its insidious onset and nonspecific symptoms. A sealed-off perforation—where the leakage is contained by surrounding tissues—may obscure the underlying pathology or mimic an inflammatory mass. Early diagnosis is crucial, especially in elderly patients, as timely surgical management can significantly improve outcomes. We report a rare case of gallbladder adenocarcinoma presenting with sealed-off perforation and cholelithiasis in an elderly woman.

II. CASE PRESENTATION

A 70-year-old woman with a history of hypertension presented to our surgical unit with complaints of dull, gradually worsening pain in the right upper quadrant for five days. The pain was associated with low-grade fever and

reduced appetite. She denied any history of jaundice, vomiting, or significant weight loss. There was no prior history of biliary disease or malignancy.

On physical examination, the patient was afebrile with stable vital signs. Abdominal examination revealed tenderness and guarding in the right hypochondrium, along with a palpable, firm, and tender mass in the same region. Laboratory investigations revealed leukocytosis, with a white blood cell count of 13,500/mm³. Liver function tests were mildly deranged, with elevated alkaline phosphatase and gamma-glutamyl transferase levels, though serum bilirubin remained within normal limits. Tumor marker CA 19-9 was elevated at 9.1 U/mL.

An abdominal ultrasound revealed a distended gallbladder with thickened walls measuring approximately 9 mm and a pericholecystic fluid collection of around 80 ml. In view of these findings, a CECT abdomen and pelvis was performed. Imaging showed a distended gallbladder with a thickened wall and a heterogeneous soft tissue lesion in the fundus, suspicious for neoplasm. There was adjacent fat stranding and localized fluid collection suggestive of a sealed-off perforation. Multiple gallstones were identified,

the largest measuring 2.1 cm. There was no evidence of liver metastasis or regional lymphadenopathy.

Based on the clinical and radiological findings, a diagnosis of gallbladder carcinoma with sealed-off perforation and cholelithiasis was made. The patient underwent radical cholecystectomy with wedge resection of liver segments IVB and V, along with regional lymphadenectomy. Intraoperatively, dense adhesions were observed between the gallbladder, omentum, and adjacent bowel. A pericholecystic abscess cavity was identified, confirming the sealed perforation. A firm, irregular mass was palpated at the gallbladder fundus, and multiple large gallstones were retrieved. There were no signs of ascites, liver surface lesions, or enlarged lymph nodes.

Histopathological examination of the surgical specimen revealed moderately differentiated adenocarcinoma of the gallbladder. The tumor infiltrated through the muscularis propria into the perimuscular connective tissue on the peritoneal side, without serosal breach. There was no evidence of vascular or perineural invasion. All surgical margins were free of tumor, and none of the six retrieved lymph nodes showed metastatic involvement. The perforation site was found to be sealed off by inflammatory adhesions. The final pathological staging was pT2aN0M0, corresponding to Stage II disease as per the AJCC 8th edition.



Fig 1 Proliferative Growth Visualised at Fundus with Thickened Gallbladder Wall



Fig 2 Gallbladder Specimen with Thickened Wall and multiple Large Calculi

Postoperative recovery was uneventful, and the patient was discharged on postoperative day seven. Given the presence of tumor perforation, albeit sealed, and to mitigate the theoretical risk of peritoneal seeding, adjuvant chemotherapy was advised. At six-month follow-up, the patient remained asymptomatic, and surveillance imaging showed no evidence of recurrence or metastasis.

III. DISCUSSION

Gallbladder perforation is a serious and potentially fatal complication of acute cholecystitis, particularly in the elderly, where presentation is often subtle. Niemeier classified GBP into three types: Type I (acute, with generalized biliary peritonitis), Type II (subacute, with localized abscess), and Type III (chronic, with cholecystoenteric fistula). Our case falls under Type II, with a localized abscess cavity due to a sealed perforation.

The presence of gallstones and chronic inflammation are well-established risk factors for gallbladder carcinoma. However, the occurrence of perforation, in the presence of carcinoma and stones concurrently, is a rare phenomenon. Importantly, sealed perforation may mask the underlying malignancy, leading to delayed diagnosis. The role of imaging is paramount in such cases. While ultrasonography is the first-line modality for suspected biliary pathology, it may not provide definitive characterization in complex cases. Contrast-enhanced CT offers better delineation of wall thickening, mass lesions, and pericholecystic inflammation or collections, thereby aiding early surgical decision-making.

Radical cholecystectomy remains the treatment of choice for resectable gallbladder carcinoma. This includes removal of the gallbladder, wedge resection of segments IVB and V of the liver, and regional lymphadenectomy. For pT2 tumors, this approach offers significantly better survival outcomes compared to simple cholecystectomy. In our case, despite the presence of a sealed perforation, no serosal breach or lymph node metastasis was observed, placing the patient in Stage II. However, the theoretical risk of peritoneal dissemination due to perforation warrants consideration for adjuvant therapy, as was planned here.

This case reinforces the need for heightened suspicion of malignancy in elderly patients with atypical presentations of cholecystitis and emphasizes the importance of a multidisciplinary approach to ensure timely intervention and optimal outcomes.

IV. CONCLUSION

Gallbladder carcinoma should be considered in elderly patients presenting with atypical or complicated cholecystitis, particularly when imaging reveals gallbladder wall thickening, mass lesions, or pericholecystic collections. Sealed-off gallbladder perforation may obscure the diagnosis, delaying definitive treatment. Early surgical exploration and histopathological confirmation are critical for accurate staging and management. Radical cholecystectomy, followed by adjuvant therapy where indicated, offers the best chance for long-term survival in such patients.

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