

## Case Report

# Gallbladder perforation with biliary peritonitis treated laparoscopically: a case report

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## ABSTRACT

Gallbladder perforation (GBP) is a rare yet life-threatening complication associated with acute cholecystitis. This report details a case of GBP accompanied by biliary peritonitis in a 73-year-old male, successfully managed through laparoscopic cholecystectomy. Our case emphasises the critical role of early employment of advanced imaging modalities, such as CT scans, and prompt surgical intervention in these situations to pre-empt potential complications.

**Keywords:** Gallbladder, Cholecystitis, Perforation, Peritonitis, Laparoscopic cholecystectomy

## INTRODUCTION

Gallbladder perforation (GBP) is a critical complication of cholecystitis, carrying a high mortality rate if not promptly diagnosed and treated. While surgical confirmation is common, it's crucial for surgeons to maintain a high index of suspicion based on imaging and symptoms. GB perforation can stem from various factors, including cholelithiasis, cholecystitis, trauma, neoplasms, steroid use, or vascular compromise. Nevertheless, acute cholecystitis remains the primary cause (in 8-11% of cases).<sup>1</sup>

Symptoms of GBP often closely resemble acute cholecystitis, featuring sharp right upper quadrant pain, high fever, nausea, vomiting, a positive Murphy's sign, and rebound tenderness indicative of local peritonitis. Ultrasound (USG) is the initial diagnostic tool of choice, with computed tomography (CT) reserved for cases where USG proves inconclusive. Among available treatments, laparoscopic cholecystectomy stands as the gold standard for managing gallbladder symptoms. This report presents a case of GBP with biliary peritonitis successfully diagnosed and treated via laparoscopic surgery, devoid of complications.

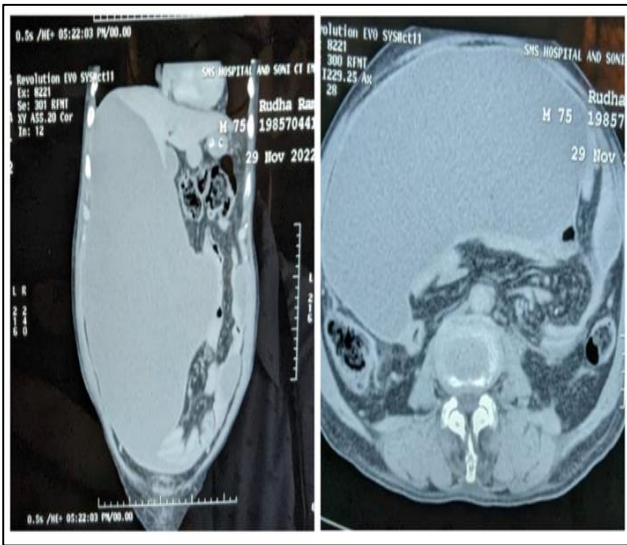
## CASE REPORT

A 73-year-old male, a chronic smoker with no known comorbidities, was admitted to the hospital due to severe generalised abdominal pain and progressive abdominal distention lasting for one day. He had previously received symptomatic treatment for cholecystitis, a condition diagnosed one month earlier. Abdominal examination revealed the presence of ascites, prompting further investigation.

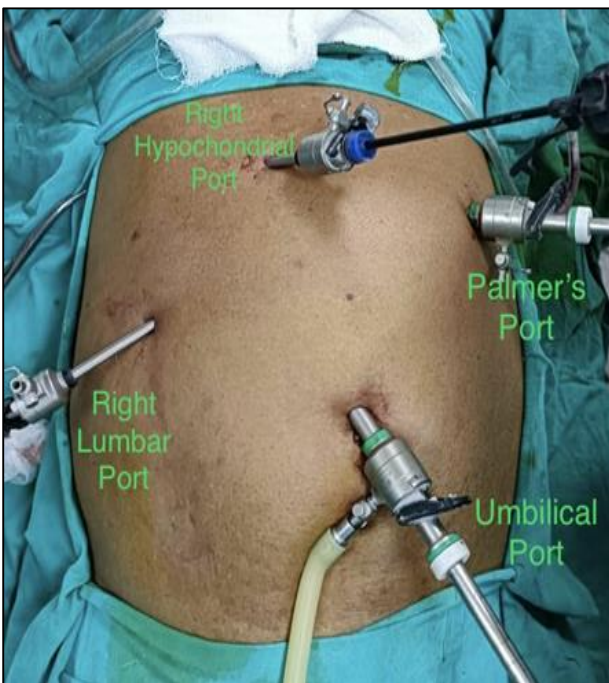
A CT scan (Figure 1) was conducted, revealing a well-defined localised collection measuring 26x11 cm, extending to the region of the antero-inferior surface of the liver, the greater sac, and the right iliac fossa, indicative of biliary peritonitis. Suspecting GBP, a diagnostic laparoscopy was performed to confirm the diagnosis.

The first port was inserted at the Left Palmer's point (Figure 2), revealing a collection of bilious fluid with thick septations in the peritoneal cavity. A second port was introduced into the abdominal cavity, allowing the suction of 4 litres of bilious fluid. Further dissection of the falciform ligament led to the identification of the

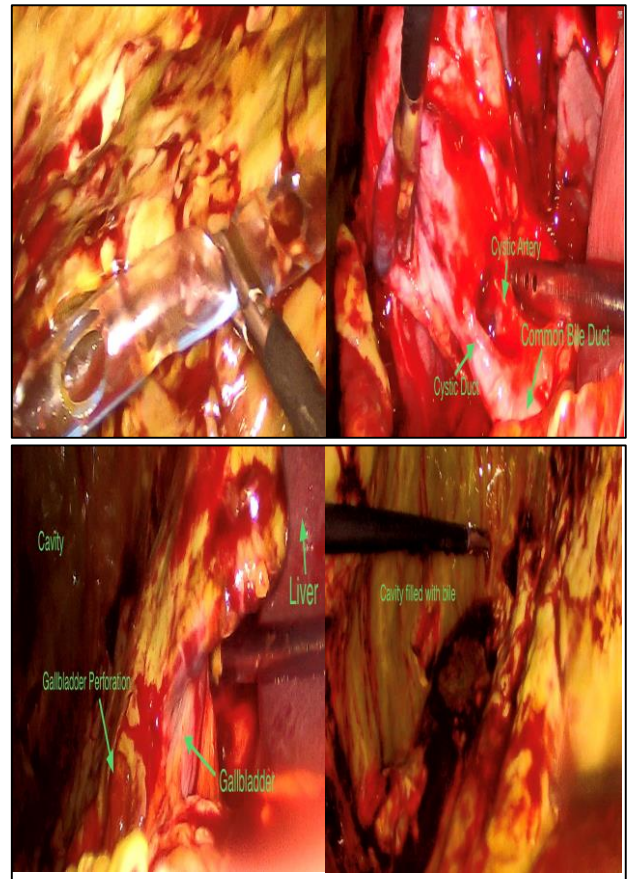
GBP site, with bile trickling. Subsequent ports were carefully placed under direct vision, and a meticulous dissection of Calot's triangle was performed. The cystic duct and cystic artery were ligated (Figure 3) and cut, and the gallbladder was dissected off the fossa and removed using an endo bag (Figure 4). The cavity was thoroughly irrigated and drained, with drains placed in Morrison's pouch and the pelvic cavity. The postoperative period was uneventful, and drains were removed on postoperative day 3. The patient was discharged without complications. Biopsy results indicated acute on chronic cholecystitis, and follow-up consultations reported no further issues.



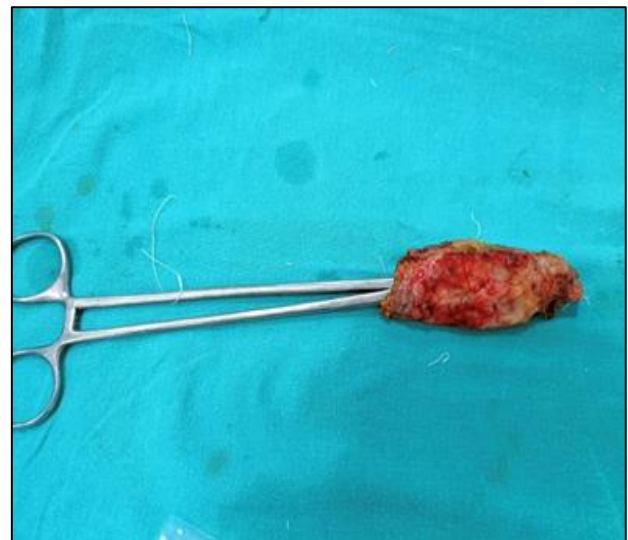
**Figure 1: CECT abdomen images showing perforated GB with large cavity of bile collection.**



**Figure 2: Port positions.**



**Figure 3: Intra-operative images.**



**Figure 4: Gallbladder Specimen.**

## DISCUSSION

Gallbladder diseases are frequently encountered in surgical practice, and they can lead to various complications. However, GBP is a relatively rare but serious complication associated with acute cholecystitis, whether or not it is accompanied by cholelithiasis. This condition arises as inflammation of the gallbladder

progresses, ultimately resulting in ischemia and necrosis of the gallbladder wall, culminating in perforation. The reported incidence of GBP following acute cholecystitis varies, ranging from 0.8% to 11%.<sup>1</sup>

In approximately 60% of cases, the site of perforation occurs at the fundus of the gallbladder.<sup>1</sup> This location is significant because the fundus lacks omental coverage, allowing bilious fluid to freely leak into the peritoneal cavity, leading to biliary peritonitis.

GBP is most commonly observed in older individuals, those with compromised immune systems, diabetes mellitus, atherosclerosis, malignancies, or organ failures, and it tends to affect males more frequently. In 1934, Niemeier classified GBP into three categories: Type 1, characterised by acute perforation with generalised peritonitis; type 2, presenting as subacute with a pericholecystic abscess or localised peritoneal involvement; and type 3, presenting as a chronic condition with a cholecystoenteric fistula.<sup>2</sup> Subsequently, Andersen et al introduced a fourth category associated with cholecystobiliary fistula in 1987.<sup>3</sup>

Patients with GBP commonly present with symptoms such as abdominal pain, a decline in general health, high fever, nausea, vomiting, and signs of peritoneal irritation, including pronounced abdominal tenderness, guarding, and rebound tenderness, particularly in cases of generalised peritonitis. Ultrasonography (USG) findings in both acute cholecystitis and GBP may include gallbladder wall thickening, distension of the gallbladder, the presence of pericholecystic free fluid, and a positive sonographic Murphy sign. Notably, the "sonographic hole sign," which visualises a defect in the gallbladder wall, is considered the sole reliable indicator of GBP; however, it may not be visible in all patients.<sup>4</sup>

Abdominal CT scan has emerged as a more definitive and superior diagnostic tool for detecting GBP.<sup>5</sup> It can clearly illustrate the gallbladder wall defect resulting from perforation, among other relevant features. Surgeons should maintain a high level of suspicion, especially when symptoms are nonspecific or have resolved. Given that ultrasonography may not consistently identify the pathology, opting for a CT scan is advisable in such cases.<sup>6</sup> Laparoscopic exploration in cases of diagnostic uncertainty, followed by cholecystectomy upon confirmation, represents the primary treatment approach for GBP.

## CONCLUSION

Gallbladder perforation, while infrequent as a complication of cholecystitis, frequently eludes early diagnosis due to the absence of specific pathognomonic features. Cases of gallbladder perforation are associated with substantial morbidity and mortality. Therefore, it is imperative for surgeons to maintain a high index of suspicion for this condition. Timely diagnosis, facilitated by a CT abdomen, and prompt surgical exploration are of paramount importance to mitigate postoperative complications. In this context, the laparoscopic technique stands out as a safer approach to reduce morbidity in such cases.

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