

# An Unconventional Approach to Treating Atypical Acute Gangrenous Cholecystitis

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## ABSTRACT

Acute calculus gangrenous cholecystitis is always treated with Laparoscopic Cholecystectomy (LC) following magnetic resonance cholangiopancreatography (MRCP) or limited LC after percutaneous cholecystostomy tube. In rare cases, MRCP cannot be performed preoperatively due to metal hemostatic clips in the patient's stomach. The authors report a case of a 32-year woman with acute gangrenous cholecystitis and a high risk of choledocholithiasis. Due to contraindications for MRCP, an unconventional approach was taken, which involved emergency laparoscopic ultrasound (LUS) and emergency LC. Simultaneously, performing the emergency LC, we inserted an LUS probe through the 10 mm trocar to check the patient's common bile duct (CBD) and intra-hepatic bile ducts. Following the exclusion of choledocholithiasis, we performed a simple LC. The use of LUS is a secure and efficient method, which should be considered in the atypical cases of acute gangrenous cholecystitis in emergencies.

**Key Words:** Cholecystitis, Laparoscopic cholecystectomy, Endosonography.

**How to cite this article:** He B, Gao S. An Unconventional Approach to Treating Atypical Acute Gangrenous Cholecystitis. *JCPSP Case Rep* 2024; 2 : 90-92.

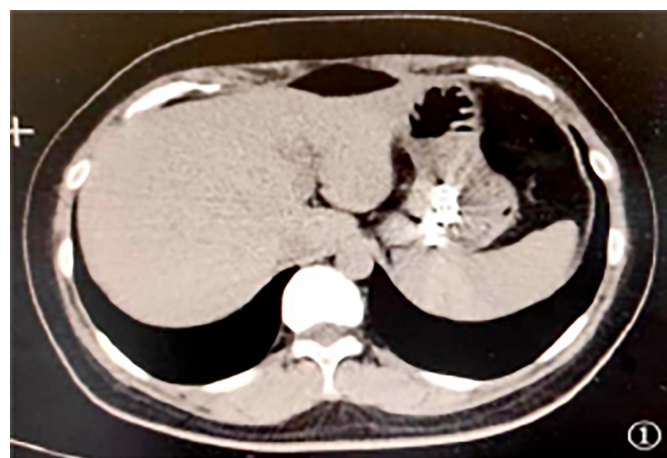
## INTRODUCTION

Acute calculous gangrenous cholecystitis is one of the most common presentations of acute abdomen. Emergency Laparoscopic Cholecystectomy (LC) is an effective treatment.<sup>1,2</sup> In patients with high bilirubin, it is important to confirm whether the common bile duct (CBD) has stones before the surgery. Computed tomography, ultrasonography, and magnetic resonance cholangiopancreatography (MRCP) are conventional non-invasive imaging techniques to confirm this. If these tests are negative for CBD stones and MRCP is forbidden, the unconventional approach of emergency Laparoscopic Ultrasound (LUS) during LC is another option. Few cases of this approach to treat atypical patients with risk factors for choledocholithiasis have been reported in the literature.

Herein, a case is reported of a 32-year woman with acute gangrenous cholecystitis in whom MRCP was contraindicated due to the presence of metal titanium clips in her stomach. An unconventional approach was taken in an emergency setting.

## CASE REPORT

A 32-year woman with a history of cholelithiasis and diabetes presented with complaints of pain in the right upper abdomen for two days. One month ago, she underwent endoscopic submucosal dissection (ESD) for a gastric polyp. Her general physical and abdominal examination revealed a fever of 37.8°C, tenderness in the upper right abdomen, and a positive Murphy's sign. Routine laboratory investigations showed her total bilirubin of 30.6  $\mu\text{mol/L}$ , with a direct bilirubin level of 18.7  $\mu\text{mol/L}$ . Further work-up proceeded with the CT scan, which showed that the gallbladder was distended, with thickening of the wall, and many titanium metal clips present in her stomach cavity (Figure 1).



**Figure 1:** CT scan showing multiple titanium metal clips in the stomach cavity.

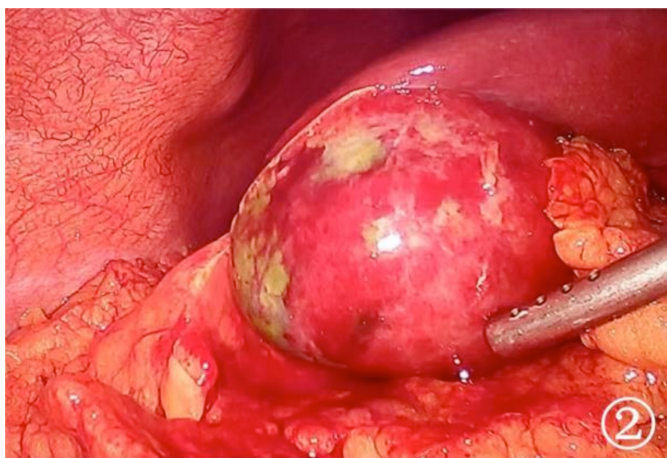
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Received: November 10, 2023; Revised: January 31, 2024;

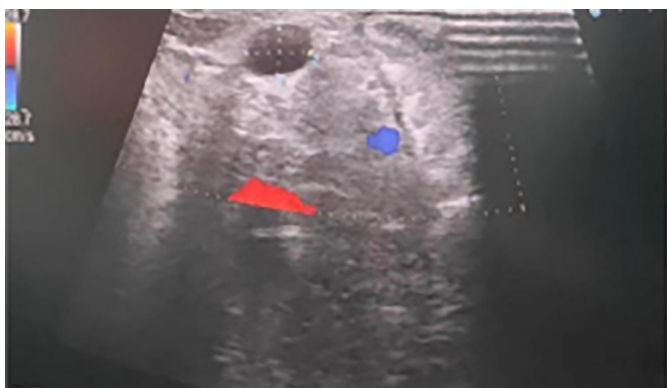
Accepted: March 03, 2024

DOI: <https://doi.org/10.29271/jcpspcr.2024.90>

A diagnosis was made of acute calculous cholecystitis with circumscribed peritonitis. After one day of expectant management, she deteriorated and an emergency LUS and LC were performed the next day. Perioperatively, an edematous and necrotic gallbladder was identified with perihepatic bile (Figure 2). It was removed after obtaining the critical view of safety for anatomical identification. Subsequently, LUS imaging was performed using a multi-frequency 10 mm flexible tip probe with a curvilinear side-viewing transducer, exploring the whole CBD. There were no CBD stones and the diameter was 0.63 cm (Figure 3). The patient eventually underwent LC. The histological study of her gallbladder revealed acute gangrenous cholecystitis in combination with calculi. She had no complaints on the follow-up for one month.



**Figure 2: Preoperative findings showing an edematous and necrotic gallbladder.**



**Figure 3: The common bile duct diameter was 0.63 cm.**

## DISCUSSION

Acute cholecystitis is an acute inflammatory disease of the gallbladder caused by gallstone obstruction. When a patient is diagnosed with acute cholecystitis, especially if it is classified as Grade II or Grade III, laparoscopic surgery should be performed within 72 hours.<sup>1</sup> The prevalence of cholelithiasis in the Chinese population is approximately 6 to 12%, and about 3 to 16% of patients with cholelithiasis also have CBD stones.<sup>2</sup> It is important to identify CBD stones before surgery. In this case, the patient had high bilirubin levels, negative CT and ultrasound results, and was unable to undergo MRCP due to the presence

of the titanium metal clips in her stomach. However, peritonitis is an emergency surgery indication. Therefore, we adopted the unconventional approach involving emergency LC and LUS to address the issue. LUS is a non-radioactive, safe, accurate, cost-effective, and non-invasive method for diagnosing choledocholithiasis, including muddy stones and bile pigment calculi, with a high sensitivity of 90-99%.<sup>3,4</sup> However, one of the main limitations of LUS is the learning curve, and the time needed for LUS can range between 5 and 10 minutes with practice. Additionally, emergency LC can decrease overall medical costs and patient discomfort when compared to percutaneous cholecystostomy tube. There are few reports of rare cases of emergency LC to cure cholecystitis patients with contraindications of MRCP,<sup>5,6</sup> but the cases of emergency LC and LUS to treat atypical patients with titanium metal clips in patient's stomach are rare.

In conclusion, the unconventional approach to emergency LC and LUS may be considered a viable treatment option for acute and complicated cholecystitis with a high risk of choledocholithiasis, especially in atypical patients.

## PATIENT'S CONSENT:

An informed consent was obtained from the patient to publish this case.

## COMPETING INTEREST:

The authors declared no competing interest.

## AUTHORS' CONTRIBUTION:

BH: Summarised the relevant literature and prepared the manuscript.

SG: Drafted and revised the manuscript.

All authors approved the final version of the manuscript to be published.

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