

## Liver Abscess Secondary to Acute Perforated Cholecystitis: Case Report and Literature Review

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### ABSTRACT

Pyogenic liver abscess is a rare clinical entity, having a reported incidence of 1.1/100,000 to 3.6/100,000 people in western countries, and with a reported mortality between 5.6-10%, however, this mortality can increase up to 22% if there are multiple abscesses. The prevalence of acute cholecystitis is reported at 0.8-3.8%; Only 2% of all patients with cholelithiasis will present a gallbladder perforation, and the reported mortality in these cases has been reported between 12 to 16%. The most common site of perforation is the gallbladder fundus because it is the most distal portion, which leads to having less blood flow. Its clinical presentation is not specific, and the ultrasound is usually the first imaging tool for diagnosis. Treatment will depend on the clinical condition of each patient. Here we present an 88-year-old female case successfully treated with laparoscopic cholecystectomy and liver abscess drainage despite hemodynamic instability.

**KEYWORDS:** pyogenic liver abscess, cholecystitis, cholecystectomy.

### ARTICLE DETAILS

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### INTRODUCTION

Pyogenic liver abscess is a rare clinical entity, having a reported incidence of 1.1/100,000 to 3.6/100,000 people in western countries, and with a reported mortality between 5.6-10%, however, this mortality can increase up to 22% if there are multiple abscesses.<sup>3,4</sup> Formation of pyogenic liver abscess associated to cholecystitis has been reported in 15 to 22% of patients.<sup>4</sup> Management will depend on the severity of the cholecystitis, and may result only in cholecystectomy or associated with percutaneous drainage of the abscess.<sup>1</sup>

### CASE PRESENTATION

An 88-year-old female patient, with a 6-year history of senile dementia with schizophrenia under management with alprazolam, a surgical history of bilateral tubal occlusion 40 years ago and umbilical hernia repair 30 years ago and denied drug addiction.

Her condition began on August 27, 2023 with the presence of evacuations with loss of consistency on two occasions, adding 1 day later abdominal pain in the epigastrium, intensity 10/10 on EVA, burning type, without irradiation, accompanied by nausea without reaching to vomiting, she started treatment with proton pump inhibitor, nifuroxazide and racecadotril without improvement in symptoms, reason why she decided to go to this medical unit.

In the emergency department, paraclinical tests were requested on August 30, which reported glucose 159 mg/dl, BUN 34 mg/dl, urea 73 mg/dl, creatinine 0.9 mg/dl, total bilirubin 1.6 mg/dl, direct bilirubin 0.9 mg/dl, indirect bilirubin 0.7 mg/dl, sodium 129 mg/dl, potassium 3.3 mg/dl, magnesium 1.8 mg/dl, phosphorus 1.5 mg/dl, calcium 7.7 mg/dl, cholesterol 127 mg/dl mg/dl, triglycerides 113 mg/dl, leukocytes  $15.5 \times 10^3$ , neutrophils  $13.9 \times 10^3$ , hemoglobin 15.2 g/dl, hematocrit 45.3%, mean corpuscular volume 95.1 fl, mean corpuscular hemoglobin 31.9 pg, platelets  $177,000 \times 10^3$ .

A general urine test was requested, which reports cloudy urine with pH 6.0, density 1.015, leukocytes 125 ca/ul, hemoglobin 80 mg/dl, proteins 100 mg/dl, abundant sediment, cells 4-6.

An abdominal ultrasound was performed and revealed a gallbladder measuring 80x38 mm, wall 5 mm, little biliary sludge, little lamellar perivesicular fluid, common bile duct 6 mm, colic framework with intestinal loops with abundant gas, intestinal thickness of 3 mm and diameter of 4 mm with some thin loops at the level of the ileum, concluding chronic non-lithiatic cholecystitis, with the possibility of exacerbation with little biliary sludge and probable intestinal ileus.

The patient was admitted to the internal medicine service with the diagnoses of metabolic ileus, hydroelectrolyte imbalance secondary to mild hypokalemia, hypophosphatemia, chronic

## Liver Abscess Secondary to Acute Perforated Cholecystitis: Case Report and Literature Review

moderate symptomatic hyponatremia and mild hypocalcemia, sepsis of probable urinary origin and exacerbated chronic acalculous cholecystitis.

On August 31, an evaluation was requested by our service, finding the patient with generalized abdominal pain, negative Murphy sign, with no signs of peritoneal irritation, hemodynamically unstable with a requirement for aminergic support based on norepinephrine at 7 ml/hr and antibiotic management with ciprofloxacin, with control laboratories on August 31 reporting glucose 172 mg/dl, BUN 39 mg/dl, creatinine 1.6 mg/dl, total bilirubin 4.2 mg/dl, direct bilirubin 3.6 mg/dl, indirect 0.6 mg/dl, TGO 73 U/l, TGP 46 U/l, DHL 355 U/l, amylase 224 U/l, lipase 166 U/l, alkaline phosphatase 176 U/l, calcium 7.1 mg/dl, magnesium 1.6 mg/dl, sodium 137 mg/dl, potassium 3.5 mg/dl, chloride 100 mg/dl, leukocytes  $33.9 \times 10^3$ , neutrophils  $31.8 \times 10^3$ , hemoglobin 13 g/dl, hematocrit 39.4%, platelets  $107 \times 10^3$ . Likewise, she has had an abdominal tomography that concludes images suggestive of hydrocholecyst with probable contiguous liver abscess (figures 1 and 2).

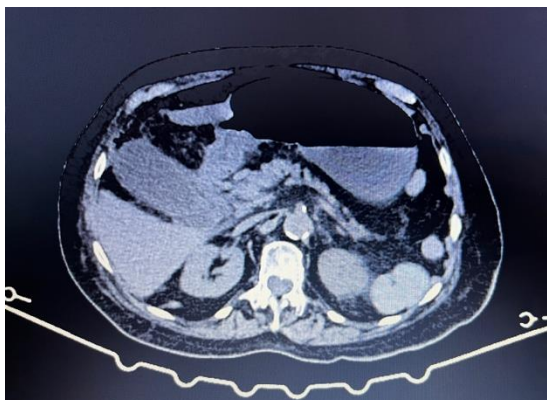


Figure 1. Axial view of computed tomography.

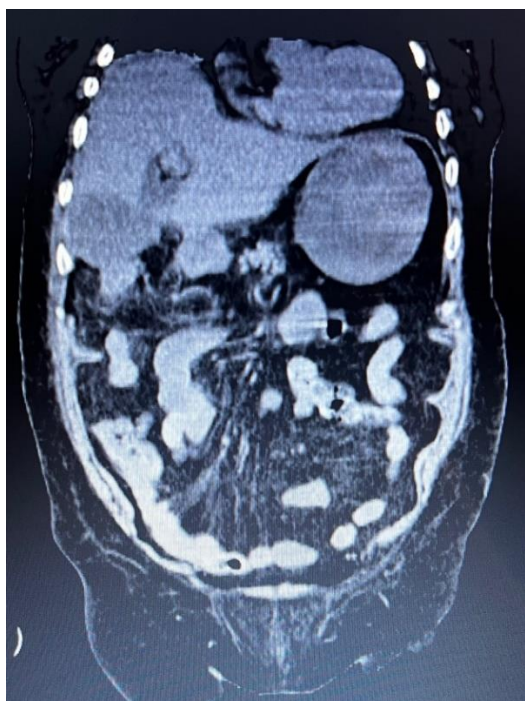


Figure 2. Coronal view of computed tomography.

Surgical time was performed with a laparoscopic approach on August 31, 2023, having the following surgical findings:

- Gallbladder measuring 12x8cm, necrotic in the middle third of the anterior surface and perforated in the posterior surface of the fundus, Niemeier II, pyocholecyst of 50 cc, cystic duct of 8 mm, anterior cystic artery of 3 mm, firm adhesions gallbladder-omentum, gallbladder-duodenum, gallbladder-colon, Parkland 5, common bile duct of 1 cm, liver abscess in segments IV and V of approximately 50 cc (figures 3 and 4).

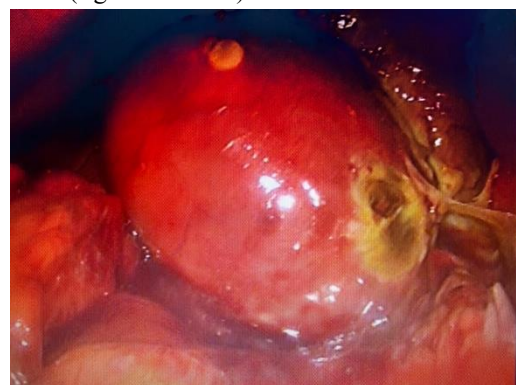


Figure 3. Anterior surface of necrotic gallbladder.



Figure 4. Perforation of the posterior surface of the gallbladder and liver abscess.

The patient progressed favorably during the immediate post-surgical period, progressively withdrawing vasoactive amines, maintaining vital signs within normal limits, antibiotic management was adjusted according to sensitivity in the literature, remaining under observation and deciding to discharge her home without complications, with subsequent follow-up in the outpatient consultation without complications, so discharge was decided by the surgery service.

### DISCUSSION

The prevalence of acute cholecystitis is reported at 0.8-3.8%; Only 2% of all patients with cholelithiasis will present a gallbladder perforation, and the reported mortality in these cases has been reported between 12 to 16%.<sup>2,4</sup>

Gallbladder perforation was described in 1934 by Niemeier, based on the direction of the perforation and the acuity of the

## Liver Abscess Secondary to Acute Perforated Cholecystitis: Case Report and Literature Review

inflammatory process, and was modified in 1951 by Fletcher and Radvein. Briefly, type I perforation presents as an acute disease with perforation in the free abdominal cavity, while type II perforation is characterized as a subacute stage with development of a pericholecystic abscess, which can affect the liver parenchyma through direct spread of infection and form a pyogenic liver abscess. Finally, type III perforation arises in chronic cholecystitis with the development of bilioenteric fistulas.<sup>3,4</sup>

The most common site of perforation is the gallbladder fundus because it is the most distal portion, which leads to having less blood flow.<sup>4,5</sup>

Some risk factors associated with pyogenic liver abscess secondary to acute cholecystitis are cirrhosis, diabetes mellitus, history of liver transplant and carcinoma.<sup>3,4</sup>

Its clinical presentation is not specific, however, it has been reported that the most distinctive characteristic is the duration of the pain, which is reported between 3 to 15 days prior to hospital admission, as well as a sudden improvement in pain secondary to the perforation.<sup>2,4</sup>

Ultrasound is usually the first imaging tool for diagnosis, being the “hole sign” the most relevant, which translates gallbladder perforation (sensitivity of 55-70%). The usefulness of tomography lies in cases where there is a discrepancy between the clinical picture and an inconclusive ultrasound. Likewise, it has been proposed to perform a CT scan on all patients with acute cholecystitis who also meet any of the following criteria: >55 years, >38 °C, leukocytes >12,000/ml, AST >50 IU/L, ALT >75 IU. /L; This is to early identify those who present with liver abscess.<sup>4,5</sup>

Current recommendations suggest performing cholecystectomy early upon diagnosis because it reduces hospital stay and conversion rate. Contraindications to performing a laparoscopic approach include those patients with uncorrected coagulopathy, high anesthetic or surgical risk, and gallbladder carcinoma. A high Charlson comorbidity index associated with high total bilirubin values may favor the choice of open surgery or high risk of conversion.<sup>1,3,4</sup>

### CONCLUSION

Liver abscess secondary to gallbladder perforation is a rare clinical entity. Its diagnosis is based on clinical suspicion and confirmation by imaging, and its therapeutic approach will depend on the clinical condition of each patient and the experience of the surgeon.

### CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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### INFORMED CONSENT STATEMENT

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A written copy is available upon request.

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