

# Emphysematous Hepatitis: A Comprehensive Clinical, Radiological, and Therapeutic Analysis

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## Abstract

## Case Report

Emphysematous hepatitis, or gas-forming hepatic abscess, is a rare but life-threatening infectious emergency. It is defined by the presence of gas within the hepatic parenchyma, typically in the context of uncontrolled diabetes mellitus. This report details the clinical and radiological case of a 45-year-old patient, highlighting the critical role of cross-sectional imaging (CT scan) in early diagnosis, the specific semiological characterization of gas-containing collections, and the necessity for aggressive, multidisciplinary management.

**Keywords:** Emphysematous hepatitis, Gas-forming liver abscess, *Klebsiella pneumoniae*, Computed tomography (CT), Diabetes mellitus, Percutaneous drainage.

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## INTRODUCTION

Emphysematous hepatitis is a distinct clinical and radiological entity, differing from classic pyogenic liver abscesses. It is characterized by the production of gas within the liver by pathogenic microorganisms, most commonly gas-producing Enterobacteriaceae such as *Klebsiella pneumoniae*. Chronic hyperglycemia, prevalent in diabetic patients, impairs immune response and fosters an environment conducive to bacterial fermentation and extensive tissue necrosis. Without prompt radiological identification and therapeutic intervention, the mortality rate associated with this condition remains significant.

## CLINICAL OBSERVATION

A 45-year-old male patient with a known history of diabetes mellitus, managed with oral antidiabetic drugs (OAD), was admitted to our service presenting with acute right hypochondrium pain that had been evolving for 7 days. The clinical presentation was further marked by persistent vomiting and high fever (up to 39°C). Physical examination revealed localized abdominal guarding in the right hypochondrium.

Laboratory investigations confirmed a major inflammatory syndrome, characterized by marked

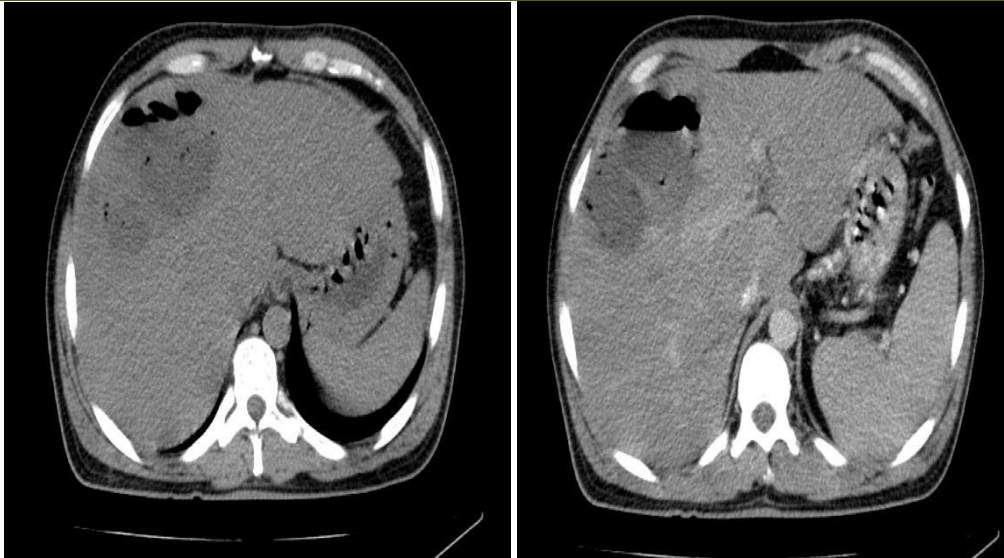
leukocytosis with neutrophil predominance and significantly elevated C-reactive protein (CRP) levels. Initial hepatic ultrasound showed well-defined collections within the right liver, which were non-vascularized on color Doppler and displayed hyper-echogenic artifacts with 'comet-tail' signs, highly suggestive of intralesional gas.

## Imaging and Radiological Diagnosis

Abdominal CT scan with intravenous contrast enhancement is the gold-standard diagnostic tool. In this patient, the imaging findings revealed:

- Multiple segmental hepatic collections localized in the right liver.
- Intralesional air appearing as discrete bubbles or distinct hydro-aeric levels.
- A notable absence of peripheral wall enhancement after contrast administration, which is pathognomonic for extensive septic necrosis and loss of viability of the adjacent liver tissue.

The correlation of these clinical and radiological findings allowed for the exclusion of pneumobilia, where air is primarily localized within the biliary tree without associated abscess formation.



## DISCUSSION

The pathophysiology of emphysematous hepatitis is rooted in the synergistic interaction between diabetes-induced immunocompromise and the rapid proliferative capacity of specific anaerobic or facultative anaerobic bacteria, notably *Klebsiella pneumoniae*. Chronic hyperglycemic states impair phagocytic function and chemotaxis, creating an intratissular environment that favors glucose fermentation, leading to the rapid accumulation of gas within the hepatic parenchyma.

The radiological appearance of necrosis lacking peripheral enhancement is a critical marker of disease severity. Unlike standard pyogenic abscesses, which exhibit a clear inflammatory rim that enhances post-contrast, the absence of enhancement in emphysematous hepatitis indicates a total infarction of the affected hepatic lobules, driven by intense local inflammatory pressure and the rapid onset of ischemic necrosis. This diagnostic hallmark is essential for distinguishing it from other gas-related pathologies, such as pneumobilia or communicating biliary-enteric fistulas.

The management strategy is complex and necessitates a multidisciplinary approach focused on the 'triptych' of care: 1) Intensive broad-spectrum intravenous antibiotic therapy, specifically targeting anaerobic flora to halt further gas production; 2) Urgent image-guided percutaneous drainage (PCD) to

decompress the liver and prevent further necrotic extension or rupture; 3) Strict metabolic stabilization, particularly glycemic control, as high blood glucose is the primary driver for bacterial metabolic activity and fermentation. While surgical intervention was once the primary management, contemporary practice prioritizes PCD as an effective, less invasive alternative. Surgery should be preserved for cases involving abscess rupture, evidence of biliary peritonitis, or instances where percutaneous strategies fail to achieve clinical stability.

## CONCLUSION

Emphysematous hepatitis is a high-stakes clinical condition requiring rapid diagnostic reaction. For any febrile diabetic patient, abdominal CT imaging should be systematic. The radiological recognition of non-enhancing, gas-containing hepatic collections is the definitive step toward life-saving intervention and surgical or interventional management.

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