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Gas-forming Pyogenic Liver Abscess: Another Variant of Liver Abscess with High Mortality

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Authors' contributions

This work was carried out in collaboration among all authors. Author SH designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors HS and HA managed the analyses of the study. Author HA managed the literature searches. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Gas-forming pyogenic liver abscess (GFPLA) is uncommon and associated with high mortality if improperly treated. We experienced a case of GFPLA due to Klebsiella Pneumoniae in a 47-year-old man with newly diagnosed DM. Classical 'alveolar gas pattern' is easily identified via X-ray with similar finding on CT scan. Ultrasound-guided percutaneous drainage was performed to drain the abscess.

Keywords: Gas forming; pyogenic liver abscess; alveolar gas pattern; klebsiella pneumonia.

1. INTRODUCTION

Gas-forming pyogenic liver abscess (GFPLA) is defined as the presence of gas within the abscess. The case was first described by Smith in 1944 [1]. This case report presents the classical features of GFPLA in term of radiological finding, and organism involved.

2. CASE PRESENTATION

A 47-year-old Malay gentleman with no comorbid conditions, presented with right hypochondriac

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pain for two weeks, associated with fever for five days and reduced oral intake. The patient denied vomiting, jaundice, tea-coloured urine or pale coloured stool. The patient worked as a chef and lives alone and denied any soil or rodent contact. At presentation, the patient appeared lethargic, hemodynamically was stable with slight tachycardia. Clinically the abdomen was tender and guarding mainly at the right hypochondriac region. Blood investigations revealed leucocytosis (WCC 18.0 10^9/L) with deranged liver function. (ALP 1237 U/L, ALT 405 U/L and total bilirubin 23.5 umol/L) and high random blood sugar of 46 mmol/L. Renal profile was normal with compensated metabolic acidosis on blood gas. The patient was then resuscitated with crystalloid and empirically started with antibiotic of carbapenem given severe intraabdominal sepsis. Further imaging with initial abdominal x-ray revealed 'alveolar gas pattern' at the right upper quadrant [Fig. 1]. The patient was then proceeded with an ultrasound abdomen to find a large heterogeneous liver lesion suspicious of liver abscess with a gas-producing organism. Further imaging with CECT Abdomen was performed to assess the liver lesion. A large ill-defined heterogeneous thick-walled collection seen occupying the right lobe of the liver at segment V and VI measuring 13x11x16cm. No breaching of the capsule to suggest ruptured collection. The biliary system was normal. Other organs were unremarkable, and no bowel-related mass was noted [Figs. 2 and 3]. The patient then proceeded with ultrasound-guided percutaneous drainage with the aspiration of 500cc of thick pus. Blood aerobes and pus cultures and sensitivities showed Klebsiella Pneumoniae and Lactobacillus Fermentum on anaerobes. Thus, antibiotic was further de-escalated based on culture sensitivity and continued for two weeks through injection. Patient was then discharged well with drainage in place. Oral antibiotic was given to complete for one month. Patient was further followed up in clinic to review the size of collection via ultrasound before decided to remove the drain.

Fig. 1. Abdominal X-ray with alveolar gas pattern can be seen at right upper quadrant

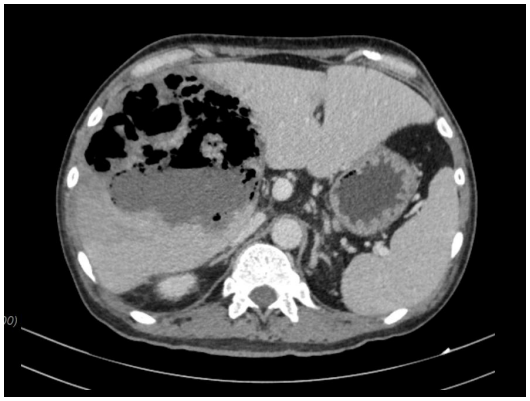

Fig. 2. Axial view of contrast enhanced CT scan of abdomen

Fig. 3. Coronal view of CT abdomen showing gas forming of liver abscess mainly confined at segment V and VI

3. DISCUSSION AND CONCLUSION

Gas forming pyogenic liver abscess (GFPLA) has up to 30% incidence among pyogenic liver abscess (PLA) cases [2,3]. One literature combining multiple case series and case reports consists of 313 patients with GFPLA [4]. From the studies, there is no significant difference can be seen among gender and age of patients. However, GFPLA cases are highly associated with diabetes mellitus (range, 74.2-95%) compared with non-GFPLA. The most common organism related to GFPLA is Klebsiella Pneumoniae which comprise 85.9% compared to non-GFPLA [2,5]. Study by Hsin-Ling et al revealed the GFPLA comprises nitrogen, oxygen, carbon dioxide and hydrogen which results from mixed acid fermentation of glucose as the mechanism of how gas-forming is developed [6].

'Alveolar gas pattern' is a common radiological finding for GFPLA and can be detected accurately using ultrasound or CT scan [7]. From Chou et al. with 424 patients, the reported ruptured rate is only 5.4% [8]. Thus, it is uncommon for pyogenic liver abscess to rupture. The mortality rate of GFPLA to be significantly higher with up to 30.4% compared with non-GFPLA patients which up to only 14.4% [4]. Most patients with GFPLA can be treated with parenteral antibiotic and percutaneous drainage of the abscess and the time of drainage does not significantly affect the mortality for GFPLA patients [7]. Retrospective study by Saleem et al revealed, percutaneous drainage of abscess is even sufficient in treating giant pyogenic liver abscess (size more than 10 cm) [9].

The patient was newly diagnosed with diabetes mellitus during the presentation. The classical features of 'alveolar gas pattern' with the same microorganism of Klebsiella Pneumoniae is apparent in this case report compared with previous literature.

CONSENT AND ETHICAL APPROVAL

As per international standard or university standard ethical approval has been collected, Patient consent has been obtained and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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