

Case Report

Pyogenic liver abscess following endoscopic retrograde cholangiopancreatography procedure for choledocholithiasis

Juin Yeen Ooi*, Ramamoorthy Velayutham

Department of General Surgery, Hospital Raja Permaisuri Bainun, Ipoh, Perak, Malaysia

Received: 23 December 2022

Accepted: 12 January 2023

***Correspondence:**

Dr. Juin Yeen Ooi,

E-mail: benjamin1193@hotmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Pyogenic liver abscess (PLA) is a condition in which there is pus accumulation in the liver. It usually develops in the context of portal pyemia, through hematogenous seeding as well as via biliary disease. PLA is a rare, but important complication following biliary instrumentation such as endoscopic retrograde cholangiopancreatography (ERCP). We report a case of a 44-year-old man who initially presented with clinical features of ascending cholangitis. Laboratory investigations revealed leukocytosis as well as hyperbilirubinemia. Diagnosis of choledocholithiasis was then confirmed with an ultrasound examination, showing a 1×1 cm stone in the common bile duct. ERCP was performed and achieved stone clearance. However, the patient returned 1 month later with similar symptoms of right upper quadrant pain, fever and jaundice. Suspecting recurrent choledocholithiasis, an emergency ERCP was performed and showed pooling of radio-opaque contrast in the extra-biliary space. There were also multiple CBD stones seen. An urgent CT Abdomen was done and revealed multiple liver abscesses in bilateral liver lobes, with the largest measuring 4.5x5.9x2.1cm. The patient was treated conservatively with Augmentin and repeat ultrasound at 4 weeks interval showed no residual liver abscess.

Keywords: Pyogenic, Liver, Abscess, ERCP, Choledocholithiasis

INTRODUCTION

Pyogenic liver abscess (PLA) is one of the most important causes of visceral abscesses.¹ The incidence rate of PLA is estimated to be 1.43 per 100,000 person-years in Southeast Asia and has been showing a rising trend over the past 20 years.² PLA is a rare, but important complication following biliary instrumentation such as ERCP. In this case report, we present a case of PLA that resulted following an ERCP procedure in a patient with choledocholithiasis.

CASE REPORT

A 44-year-old man came to the emergency complaining of fever, right upper quadrant discomfort and jaundice. Physical examination reveals a tender right upper quadrant with positive Murphy's sign. Initial laboratory

investigations revealed significant leukocytosis of 26.9 ($\times 10^9/L$) with raised bilirubin (total bilirubin 103.2 $\mu\text{mol/L}$ with direct predominance) and transaminitis (ALT 1162 U/L, AST 570 U/L, ALP 276 U/L). An urgent ultrasound hepatobiliary system was performed and demonstrated a common bile duct (CBD) stone measuring 1x1cm with CBD wall thickening suggestive of cholangitis.

The patient was started on empirical antibiotics of ceftriaxone and metronidazole which was later changed to Augmentin as cultures returned positive for *Klebsiella* spp. ERCP procedure was performed 2 days later after controlling his sepsis. During the ERCP, we noted a dilated CBD of about 2cm with multiple filling defects seen in the CBD largest measuring 1.1 cm. Endoscopic sphincterotomy was done to facilitate stone removal. The ERCP procedure was successful and the patient was

discharged home while being planned for interval laparoscopic cholecystectomy.

However, the patient presented 1 month later with similar symptoms of fever, right upper quadrant discomfort and jaundice. Clinical suspicion of recurrent choledocholithiasis was made. A repeat ERCP was performed and we noticed pooling of radio-opaque contrast in the extra-biliary space. There were also multiple CBD stones seen. A CT scan abdomen was done and revealed multiple liver abscesses in bilateral liver lobes, with the largest measuring 4.5×5.9×2.1 cm in segment II.

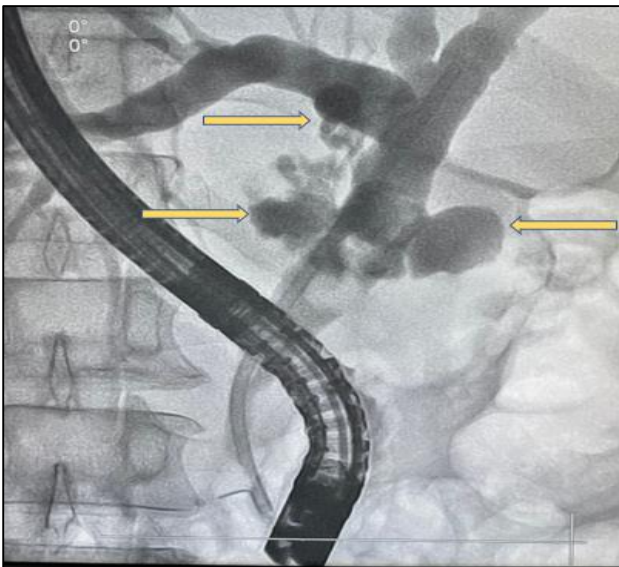


Figure 1: Arrows showing extra-biliary contrast suggestive of hepatic abscesses. Biliary stent is seen in-situ with presence of two common bile duct stones.



Figure 2: Arrow showing hepatic abscess in segment IV.

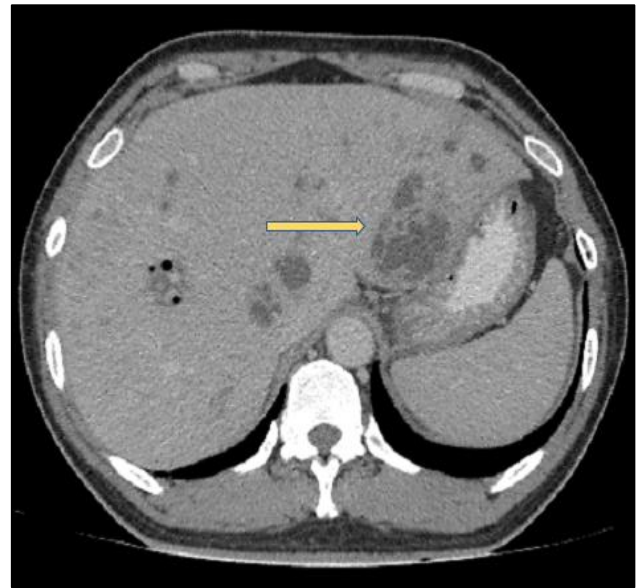


Figure 3: Arrow showing the largest hepatic abscess at segment II with smaller abscess in bilateral liver lobes.

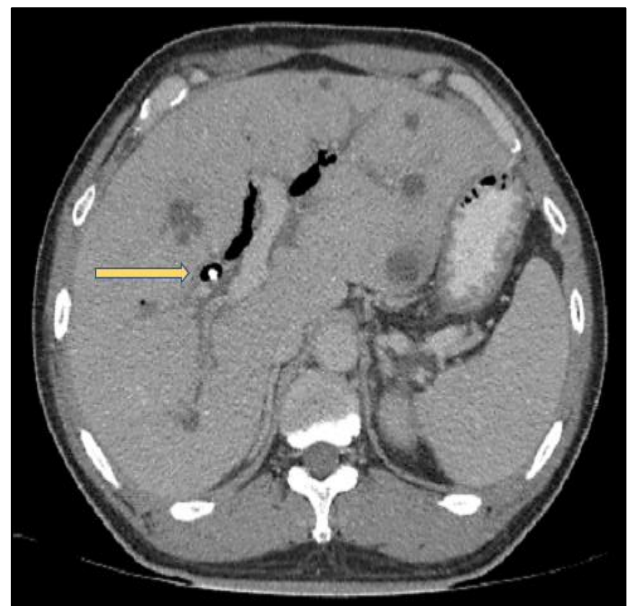


Figure 4: Arrow showing biliary stent in common bile duct with presence of pneumobilia.

The patient refused percutaneous drainage and was treated conservatively with Augmentin as repeated blood cultures grew *Klebsiella* spp. The patient improved in ward and was discharged home to complete a total of 4 weeks of Augmentin. The liver abscess resolved after antibiotic therapy as evidenced by reassessment ultrasound, which showed no residual liver abscess.

DISCUSSION

In this case report, we describe a patient with a rare complication after a therapeutic ERCP. Upon literature

review, we have found one other case report that presented a similar clinical scenario. Merei et al reported 69-year-old man with ascending cholangitis who underwent ERCP and developed PLA. Unfortunately, the patient's condition was further complicated with a right psoas abscess that extended to form an epidural abscess at the L4-L5 level requiring multiple surgeries for abscess drainage and decompressive laminectomy. Post-surgery, the patient improved on antibiotics and follow up imaging showed almost complete regression of the liver and psoas abscess.

PLA is an increasingly common clinical condition worldwide.²⁻² Causes of PLA are mainly cryptogenic (44.7%) and biliary in origin (38.3%).^{2,3} Commonest bacteria associated with PLA is *Klebsiella* spp., which is the case in our patient. Abscesses smaller than 5cm are recommended to be managed conservatively, however, for abscesses larger than 5 cm, drainage (either percutaneously or surgical) is generally recommended.^{4,5}

In the context of our patient, it is important to note that PLA is a rare but important clinical complication of ERCP. PLA has been recognized as a potential complication of ERCP as early as the 1990s. In a study done in Hong Kong, Lam et al found a correlation between liver abscess and ERCP. He reported that 21 out of 63 patients (33%) with liver abscess had a history of biliary surgery or ERCP. This included 2 patients who had done prior endoscopic sphincterotomy (ES).⁶ This correlation was later proven significant by Peng et al who found that patients who received ES during ERCP are at a significantly higher risk of PLA. This recent excellent study included two groups of 8174 patients, one group with ES and another without. The two groups were compared for the incidence of PLA and found that the group who received ES had a significantly higher incidence of PLA (4.2 vs 0.94 per 1000 person-years).⁷

Ultrasound is the preferred first-line imaging modality of choice to detect liver abscess. However, unique to this case report, we opted for an urgent CT scan because the cholangiogram revealed extra-hepatic contrast pooling. Based on this finding, our clinical suspicions included a disrupted biliary tree (perforated CBD) or a choledochocolonic fistula. Both of these complications are rare. Perforated CBD were only reported in 30 out of 6620 ERCP procedures (0.45%) in the United States.⁸ On the other hand, to the best of the author's knowledge, there was only one case report describing choledochocolonic fistula as a complication of choledocholithiasis. This condition was treated conservatively by Parikh and colleagues with ERCP and stenting as the patient had cardiac comorbidity.⁹

Drainage and antibiotic therapy are the mainstay components for treatment of PLA. Traditionally, PLA was managed with open drainage. With the advances of antimicrobial therapy and the availability of interventional radiology, PLA has rarely required

operative management. Conventionally, abscesses smaller than 5cm may be treated with antibiotic therapy alone, but additional imaging-guided percutaneous drainage (aspiration or catheter placement) is required for lesions larger than 5 cm.⁴ Open or laparoscopic drainage is only considered in the event percutaneous drainage has failed or is not feasible. For "difficult-to-access" abscesses such as the caudate lobe and the left lobe of liver, endoscopic ultrasound-guided drainage has been described to be successful, with similar rates of resolution, relapse and complication when compared to percutaneous drainage.^{4,10}

To our knowledge, there are no RCTs or meta-analyses that investigated the role of antibiotic prophylaxis prior to ERCP for the prevention of PLA. However, a systematic review that included 1573 patients in 9 RCTs concluded that prophylactic antibiotics resulted in less bacteremia, septicemia and cholangitis.¹¹ The study, however, lacked data on the choice of antibiotic recommended as prophylaxis. In the context of our clinical setting and patient, we routinely administer a third-generation cephalosporin prior to procedure.

CONCLUSION

PLA is increasingly common in clinical practice. Our case underlines the importance of recognizing PLA as a potential complication of ERCP, particularly in patients who received endoscopic sphincterotomy.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Altemeier WA, Culbertson WR, Fullen WD, Shook CD. Intra-abdominal abscesses. *Am J Surg.* 1973;125:70.
2. Fatinathan C, Nawawi K, Periyasamy P, Zakaria S, Wong Z, Yaacob N et al. Pyogenic liver abscess: A 14-year retrospective analysis of the incidence trend and clinical outcomes at a Malaysian tertiary referral centre. *Int J Infect Dis.* 2020;101:138.
3. Rahimian J, Wilson T, Oram V, Holzman RS. Pyogenic liver abscess: recent trends in etiology and mortality. *Clin Infect Dis.* 2004;39(11):1654.
4. Chin YK, Asokkumar R. Endoscopic ultrasound-guided drainage of difficult-to-access liver abscesses. *SAGE Open Med.* 2020;8:2050312120921273.
5. Tan YM, Chung AY, Chow PK. An appraisal of surgical and percutaneous drainage for pyogenic liver abscesses larger than 5 cm. *Ann Surg.* 2005;241:485.
6. Lam YH, Wong SK, Lee DW, Lau JY, Chan AC, Yiu RY et al. ERCP and pyogenic liver abscess. *Gastrointest Endosc.* 1999;9.

8. Peng Y, Lin C, Sung F. Risk of pyogenic liver abscess and endoscopic sphincterotomy: a population-based cohort study. *BMJ Open.* 2018;10..
9. Wu HM, Dixon E, May GR, Sutherland FR. Management of perforation after endoscopic retrograde cholangiopancreatography (ERCP): a population-based review. *HPB (Oxford).* 2006;8(5):393-9.
10. Parikh JV, Dalal PR, Patel AM, Desai ID. Choledcho-Colonic Fistula: A Rare Presentation of Choledocholithiasis "A Rare Biliary-Enteric Fistula Associated Choledocholithiasis. *Ind J Surg.* 2021;83:790-2.
11. Carbajo AY, Brunie Vegas FJ, García-Alonso FJ, Cimavilla M, Torres Yuste R, Gil-Simón P et al. Retrospective cohort study comparing endoscopic ultrasound-guided and percutaneous drainage of upper abdominal abscesses. *Dig Endosc.* 2019;31(4):431-8.
12. Brand M, Bizo D, O'Farrell P Jr. Antibiotic prophylaxis for patients undergoing elective endoscopic retrograde cholangiopancreatography. *Cochrane Database Syst Rev.* 2010;1.

Cite this article as: Ooi JY, Velayutham R. Pyogenic liver abscess following endoscopic retrograde cholangiopancreatography procedure for choledocholithiasis. *Int Surg J* 2023;10:285-8.