

Pyogenic Liver Abscess: An unusual resentation of biliary tract disease in older patients

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Abstract:

Liver abscesses are uncommon in the West. Most are pyogenic in etiology and due to intra-abdominal pathology. In this report we describe two patients who presented with pyrexia in whom abdominal imaging revealed pyogenic liver abscesses and concurrent biliary tract disease. We also review the literature and the evidence for management of liver abscesses with particular focus on liver abscesses caused by biliary tract disease.

Introduction

Liver abscesses are relatively uncommon. Although the worldwide incidence is not accurately known, the incidence in the developed world is estimated to be 1.1 per 100,000 population¹. Liver abscesses can be broadly classified as pyogenic, fungal or amoebic. Pyogenic abscesses are usually polymicrobial, caused by gram negative (often gut derived organisms), gram positive and anaerobic bacteria. Pyogenic liver abscesses (PLA) are the most common type of liver abscess seen in the United Kingdom and other developed countries.²

The most common etiology of pyogenic liver abscesses is biliary tract disease. Pyogenic abscess formation may also occur in pre-existing liver lesions, including hepatocellular carcinoma, following Endoscopic Retrograde Cholangiopancreatography (ERCP) or due to concurrent intra-abdominal disease such as diverticulitis or colonic malignancy.

We present two representative cases of a series of pyogenic liver abscesses where the underlying causative factor was biliary tract disease. A review of the literature and clinical practice guidelines for management of such liver abscesses is also provided in the discussion.

Clinical Cases

Case 1:

A 54-year old male with Type 2 diabetes mellitus, previous inferior myocardial infarction and moderate left ventricular systolic dysfunction presented with a three-week history of pyrexia, abdominal pain and weight loss. Blood tests revealed elevated inflammatory markers (CRP 302mg/L, WCC $14 \times 10^9/\text{ml}$) and abnormal liver function tests (Alkaline phosphatase 156 IU/L, Bilirubin 18 mmol/L and ALT 152 IU/L). Blood cultures did not grow any organism. A Chest X-ray revealed a raised right hemi-diaphragm. Biliary sepsis was suspected due to the abnormal liver function tests and he was started on intravenous co-amoxiclav. Abdominal ultrasound showed a large mass in the right lobe of liver measuring approximately 16cm in diameter, which was loculated with low-level internal echoes suggesting fluid. The gallbladder was contracted, thick walled and contained stones and debris. These appearances were suggestive of a large hepatic abscess with chronic cholecystitis and cholelithiasis.

The patient failed to show significant improvement with co-amoxiclav in 72 hours and following discussion with microbiologists, the patient was commenced on piperacillin with tazobactam, 4.5gm intravenously, 8 hourly. A CT scan was arranged to evaluate the abscess further and plan for catheter drainage if the patient did not improve with the change in antibiotics. The CT scan showed a huge multilocular abscess with evidence of cholecystitis, gallbladder stones and oedema in the adjacent liver parenchyma. (Figure 1)

In view of the size of the abscess and the poor response to antibiotics alone, a CT guided percutaneous drainage was performed with a 10Fr pigtail drain, which was left in situ for six

days. The patient started to improve following the drainage and a repeat CT scan one week later showed a reduction in the size of the abscess after which the drain was removed. The amount of drainage also decreased over this period of time. The abscess fluid grew *Streptococcus milleri* on culture, sensitive to penicillin, and on microbiological advice the patient was given oral co-amoxiclav for a total of six weeks after completing a week of intravenous piperacillin. The patient was well at discharge and went on to have a cholecystectomy as an elective procedure after eight weeks. The patient was doing well at clinic follow up.

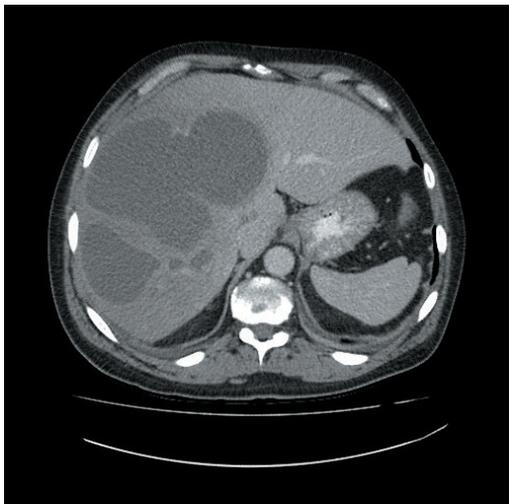


Fig. 1. CT scan of case 1 showing a huge multilocular abscess

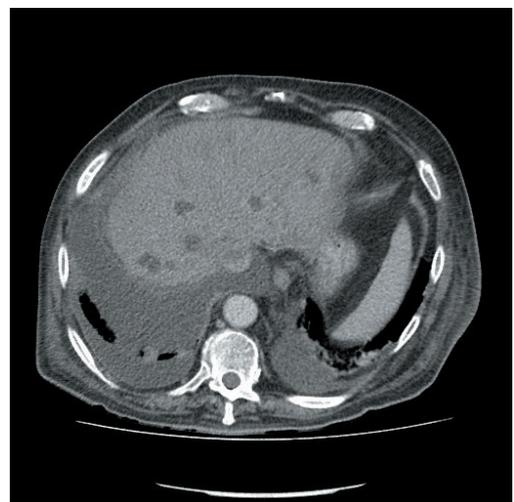
Case 2:

A 78 year old man was admitted following a fall and fracture of the neck of femur. He had a past medical history of hypertension and previous laparoscopic cholecystectomy. Whilst in hospital he became unwell with pyrexia and raised inflammatory markers (CRP 200 mg/L, WCC $12 \times 10^9/\text{ml}$) with abnormal liver function tests (Alkaline phosphatase 500 IU/L, Bilirubin 40 $\mu\text{mol/L}$ and ALT 14 IU/L). A Chest X-ray showed a right-sided pleural effusion and he was initially treated as having a hospital acquired

pneumonia. An abdominal ultrasound showed numerous hepatic cystic lesions, suggestive of multiple abscesses. A CT scan of thorax, abdomen and pelvis was carried out to confirm the nature of the liver lesions. This showed similar lesions in the liver, and also recommended aspiration or biopsy of the lesions as it was difficult to distinguish between metastases and liver abscesses, although no primary malignancy was identified. It was also noted that the common bile duct was prominent and mildly dilated. An MRI scan could not be performed due to the recent dynamic hip screw insertion.

The patient was started on antibiotics (ciprofloxacin, doxycycline and metronidazole – chosen due to penicillin allergy) and a repeat CT was carried out two weeks later. This showed multiple hepatic abscesses (Fig.2.) as well as large calculi in the bile ducts. There was gas within the biliary tree, suggestive of biliary tract infection.

Fig. 2. CT scan of case 2 showing multiple small



hepatic abscesses.

An ERCP with biliary stenting was therefore carried out to drain the bile duct. Liver function tests improved and inflammatory markers settled down to normal over the next 4 weeks.

Discussion

Pyogenic liver abscesses (PLAs) due to gall bladder and biliary tract disease have been reported in the literature, but there has been a change in the clinical presentation of this condition, from an uncommon presentation in younger patients to a more common presentation in older patients^{3,4}. As patients live longer and the age-related prevalence of gallstones increases, the incidence of PLA is likely to increase as well. The mode of spread of bacteria from the gallbladder to liver is unknown but a number of theories exist, the two commonest being direct spread from the gallbladder or the biliary tract into the liver parenchyma, and spread via the portal vein⁵. Following acute cholecystitis, the average time interval for presentation with a liver abscess can vary from weeks to months.

Patients typically present with a constellation of symptoms which includes abdominal pain, fever and anorexia⁶. Investigations usually show abnormal liver function tests and raised inflammatory markers⁷. An Ultrasound scan of the abdomen should be the first investigation to confirm the diagnosis and a CT scan of the abdomen is recommended to determine the primary cause of the abscess.

PLAs are usually polymicrobial in etiology and hence antibiotics for treatment should target gram negative, gram positive and anaerobic organisms. The most common causative bacteria are of bowel origin such as E-Coli and Klebsiella⁸. In immunocompromised patients, it is important to consider empirical therapy for Candida species. In the majority of cases definitive treatment with drainage of the abscess is necessary – either by aspiration, percutaneous drainage or surgical intervention. Current evidence suggests that small abscesses (less than 3cm)⁹ can be managed by antibiotics alone, although every effort should be made to obtain a sample of the pus for culture and sensitivity. Abscesses larger than this should be aspirated or have a percutaneous drain inserted

under CT or ultrasound guidance¹⁰.

There are conflicting views on the value of multiple aspirations as a treatment for liver abscesses with it being comparable to percutaneous drainage in some reports¹¹. Other papers have shown higher failure rates for needle aspiration compared with percutaneous drainage, particularly for larger abscesses¹².

Despite the current trend towards percutaneous drainage there remains a role for surgical intervention. Heneghan et al suggest the following indications for surgery.¹³

- No clinical response after 4-7 days of drainage via a catheter placed in the abscess cavity.
- Multiple, large, or loculated abscess
- Thick walled abscess with viscous pus
- Concurrent intra-abdominal surgical pathology.

Patients with underlying biliary disease are at increased risk of recurrence and failure of initial drainage of the abscess. ERCP plus stenting, sphincterotomy, dilation or insertion of nasobiliary catheter has been shown to be effective in this category of patients.¹⁴ As with any patient who has symptomatic biliary tract disease cholecystectomy should be considered in due course.

Antibiotic therapy is often necessary for four to six weeks. The antibiotics should only be stopped if the patient has clinically improved and inflammatory markers have normalised¹⁵. A repeat abdominal ultrasound is often undertaken to ensure abscess resolution.

Conclusion

Pyogenic liver abscesses are relatively uncommon in the UK but need to be considered in the differential diagnosis of elderly patients presenting with pyrexia and abdominal symptoms. Patients often present with non specific symptoms and

an ultrasound scan of the abdomen should be the first step towards establishing a diagnosis. There are many possible underlying causes of a liver abscess but biliary tract disease is emerging as the most common causative factor. Although prompt and appropriate antibiotics are important, drainage is often required in abscesses over 3cm.

Percutaneous drainage is usually the first line option although surgical drainage still has a role in certain circumstances. Patients with underlying biliary tract disease have a higher failure rate after initial drainage and ERCP should be considered in this group of patients.

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