

Hepatic abscesses in elderly patients mimicking metastatic disease

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Abstract

Background There is considerable overlap between the clinical presentation and radiological appearances of hepatic abscesses and hepatic metastases. The distinction is important given the treatable nature of hepatic abscesses compared with most forms of metastatic disease and the very high morbidity and mortality associated with untreated or missed pyogenic abscesses.

Aims The aim of this series of case reports is to illustrate this point by presenting the case histories of three elderly patients whose clinical and radiological findings suggested metastatic liver disease, but who were subsequently proven to have liver abscesses.

Methods A comprehensive review of the clinical and radiological records of three patients.

Results Ultrasonography and computer tomography (CT) imaging in all three cases was suggestive of metastatic liver disease. The liver lesions were subsequently proven to be abscesses either by autopsy, needle aspiration or inspection at open surgery.

Conclusions Liver abscesses can mimic metastatic deposits. Correlation with the white cell count (WCC) can be very helpful. Fine needle aspiration (FNA) of liver lesions should be undertaken, especially if the WCC is elevated.

Introduction

In the developed world, hepatic abscesses are normally caused by pyogenic organisms. Common aetiologies include biliary sepsis and peritoneal sepsis, especially diverticulitis, appendicitis and perforated colonic carcinoma. Overwhelming sepsis from any source, leading to septicaemia and septic emboli, will also cause hepatic abscess.¹ Patients sometimes present with a classical triad of fever, right upper quadrant tenderness and malaise, but all three features are present in less than one-third of cases.² Fever is the most common presenting symptom and occurs in over 90% of cases.³ Onset is often insidious in the elderly and immunocompromised.

This report presents short case histories of three elderly patients with multiple liver abscesses who presented with anorexia, malaise and right upper quadrant pain but no fever. The clinical presentation and initial imaging in these patients was suggestive of metastatic disease.

Patients and methods

The authors undertook a retrospective review of the medical records and radiological investigations of three consecutive patients, whose initial presentation and imaging findings were in keeping with metastatic disease to the liver, but who subsequently transpired to have liver abscesses.

Results

Case 1

A 67-year-old female was admitted for investigation of

weight loss and dysphagia of two months duration. Clinical examination revealed a cachectic, afebrile patient with an enlarged non-tender liver. Oesophageal carcinoma, metastatic to liver, was suspected clinically. A full blood count revealed a normochromic, normocytic anaemia with serum haemoglobin (Hb) of 7.5g/dl and elevation of white blood cell count (WCC) at $19.6 \times 10^9/l$, (neutrophils $15.6 \times 10^9/l$). Liver enzymes were elevated with a predominantly cholestatic picture.

Abdominal ultrasound showed multiple hypochoic liver lesions of varying size, without posterior acoustic enhancement. These were reported as being consistent with multiple metastatic deposits. The patient had an ultrasound-guided liver biopsy.

Histopathologic examination of the tru-cut liver biopsy showed no viable neoplastic cells and appearances were suggestive of a necrotic neoplasm or necrotic tissue in close proximity to a neoplasm. The following day she developed a pyrexia of $39.4^\circ C$, and became acutely unwell. Septic screen revealed no source of infection, and multiple blood cultures were negative over the following days.

Despite aggressive broad-spectrum antibiotic therapy the patient's condition deteriorated over the following week, and she died from overwhelming sepsis with disseminated malignancy.

A post-mortem examination revealed multiple liver abscesses and a right sub-phrenic collection with extensive peritonitis. *Staphylococcus aureus* and *Escherichia coli* were cultured from the sub-phrenic collection.

Case 2

A 71-year-old female presented with mild right upper quadrant pain radiating to her shoulder, which had developed gradually over the previous two weeks. Clinical examination revealed an afebrile cachectic patient with some right upper quadrant tenderness, but was otherwise non-contributory. Metastatic liver disease was again suspected clinically.

Complete blood count revealed a normal haemoglobin level and mild elevation of WCC at $13.2 \times 10^9/l$. Serum bilirubin and alkaline phosphatase were normal at $10 \mu\text{mol/l}$ and 250I.U./l respectively. Serum alanine transaminase was elevated at 347I.U./l ($<50 \text{I.U./l}$). Abdominal ultrasound showed gallstones and multiple hypoechoic lesions of varying sizes in the liver, and these were again reported as being consistent with multiple metastatic deposits. Dynamic CT confirmed the presence of multiple hypoattenuating lesions (Figure 1).

A search for a primary malignancy was unrewarding. Ultrasound-guided liver biopsy using an 18 G automated tru-cut needle was performed and this showed abundant polymorphonuclear leukocytes but no malignant cells. The pathology report suggested repeating the biopsy and also suggested the possibility of an abscess.

The day after the biopsy the patient developed a fever and her WCC rose to $42 \times 10^9/l$. The biopsy was repeated and on this occasion a 22 gauge needle was used to aspirate cells for cytopathologic interpretation. Aspiration yielded pus, which on culture grew *Streptococcus milleri*. The patient was immediately commenced on broad-spectrum antibiotics, and repeated therapeutic needle aspirations of the liver abscesses were performed. Her condition slowly improved over the next two weeks, with complete resolution of the liver abscesses on a follow-up CT examination three months later.

Case 3

A 76-year-old male presented with a one-week history of diarrhoea and vomiting. Clinical examination revealed an afebrile asthenic patient with mild right upper quadrant tenderness. Haematological investigations revealed mild anaemia with serum haemoglobin of 11.9g/dl (normal $12\text{--}16 \text{g/dl}$), and a markedly elevated WCC of $27.6 \times 10^9/l$ (neutrophils $24.2 \times 10^9/l$). Biochemical profile showed normal serum bilirubin and alkaline phosphatase, with mild elevation of alanine transaminase at 76I.U./l (normal $<50 \text{I.U./l}$).

Abdominal ultrasound revealed two hypoechoic lesions in the right lobe of the liver, the larger measuring $5 \times 4 \text{cm}$, and the smaller $3 \times 3 \text{cm}$. CT confirmed these findings, and in addition showed some focal thickening in the sigmoid colon, with perimesenteric inflammation and dilatation of small bowel adherent to the sigmoid mesocolon. The working diagnosis was one of locally advanced sigmoid colon carcinoma with liver metastases.

This patient underwent surgery, which revealed marked sigmoid diverticulitis, with small bowel loops adherent to the bladder. A Hartmann's procedure was performed. The lesions in the right lobe of the liver were abscesses, which were surgically drained at the time of operation. Post-operative recovery was uneventful, and the patient was discharged two weeks later, following a prolonged course of broad-spectrum antibiotics.

Discussion

Liver abscess is associated with significant morbidity and mortality. The classical clinical presentation with fever, right upper quadrant tenderness and malaise is rare, and the con-

dition may mimic a number of others, such as metastatic liver disease in particular.³

Liver abscesses are often found in the elderly, the immunocompromised and increasingly in recent years, drug addicts. Gram-negative organisms, particularly *E. coli* and gut anaerobes, such as *Clostridium* and *Bacteroides* spp, have traditionally been considered the most common causative organisms, although in long-standing cases there may be infection by multiple organisms, and normal oral flora, such as *Streptococcus sanguis*, *S. mitis* and *S. milleri* often feature, as in one of the patients.¹

Sonographic findings vary with the stage of abscess evolution. Initially, infected areas are hypoechoic, with irregular, stellate outlines, but later become cystic with a well-defined wall. Gas, seen as a collection of very bright echoes with characteristic bright 'comet's tail' distal artefact, is uncommon but diagnostic.⁴ The liver lesions seen in these patients were all hypoechoic but did not have gas or posterior acoustic enhancement to suggest the diagnosis of abscess.

CT has 97% sensitivity in detection of hepatic abscesses that typically appear as low-attenuation fluid collections ($10\text{--}30 \text{HU}$) peripherally defined by a narrow rim of oedematous and inflammatory hepatic parenchyma. The presence of a small amount of air in the abscess increases CT specificity. The rim of the abscess enhances in the arterial phase of an i.v. contrast-enhanced abdominal CT scan, and becomes hypodense in the portovenous phase when contrast material washes out of it. This pattern of enhancement is also seen in many metastatic liver lesions.⁵

This series is comprised of three elderly patients with non-specific clinical symptomatology, but who were clinically suspected to have neoplastic disease. Their imaging findings did nothing to allay this clinical suspicion. The authors think it salutary to observe that, while none of the patients were pyrexial on admission, they all had elevated WCC.

The absence of a pyrexia on admission made the diagnosis of hepatic abscess elusive in all of these patients. The natural tendency is to assume that multiple liver lesions on imaging studies in elderly patients represent liver metastases rather than other pathology, but to miss an abscess is probably to miss the most readily curable condition compatible with the ultrasound/CT picture described in the case histories. The clue in these patients that neoplastic disease was not the diagnosis was the elevated WCC. This laboratory information is now widely available through hospital information systems and may help to suggest the diagnosis of hepatic abscess if elevated. Additionally, the diagnosis was missed in two of the patients because tru-cut biopsies were performed without fine-needle aspiration (FNA). As a cytopathologist was not in attendance during FNA, core biopsy of liver lesions is usually performed using automated tru-cut type biopsy devices. The use of a fine gauge needle for aspiration may have yielded the diagnosis earlier in two of the patients. Certainly, in elderly patients, it is worthwhile to check the WCC routinely and, if elevated, FNA of the lesion should be performed in addition to a tru-cut biopsy.

In summary, case histories of three elderly patients are presented in whom the diagnosis of hepatic abscess was missed or delayed both clinically and radiologically, because of the lack of characteristic clinical signs and symptoms and because of the fact that hepatic abscesses mimic liver metastases radiologically. Elevation of WCC should alert one to the possibility of hepatic abscess in elderly patients with multiple liver lesions.

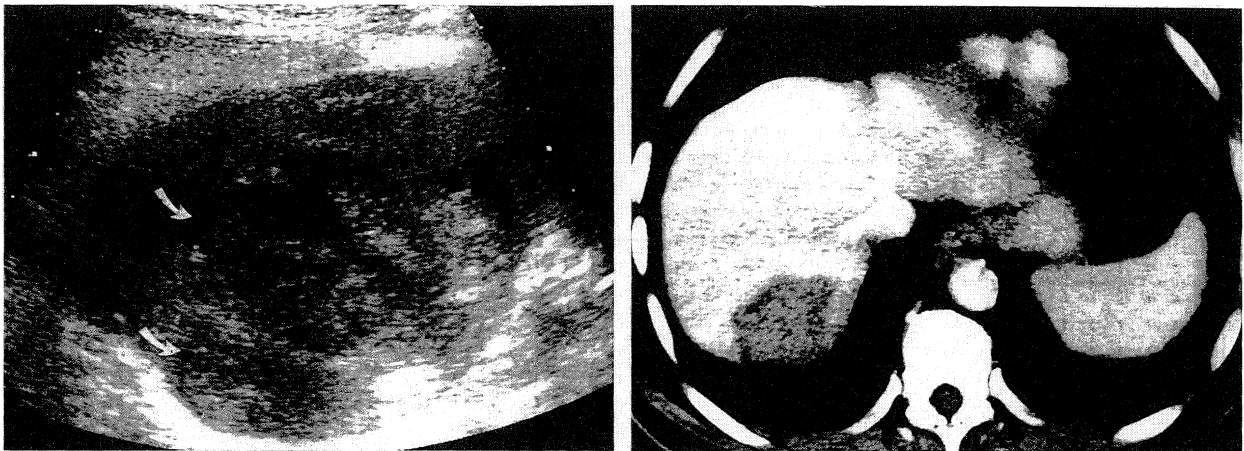


Figure 1. Patient who presented with multiple liver lesions, weight loss and anorexia. (a) An ultrasound shows multiple lesions (arrow) in the liver. The lesions are of mixed echogenicity and consistent with metastases. (b) Axial CT image through one of the lesions confirms the presence of low attenuation lesion without any features to suggest the presence of an abscess. A tru-cut biopsy was obtained from one of the liver lesions that showed inflammatory cells that suggested the presence of an abscess. A repeat needle aspiration confirmed the presence of pus.

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