CASE REPORT

A liver abscess presenting as bowel obstruction and perforation

Jan Rusman

Accident and Emergency
Department, Chelsea
Westminster Hospital, London,
UK

Correspondence to

Dr Jan Rusman,
jan_rusman@yahoo.com

SUMMARY

A 69-year-old cachexic man presented with tachycardia and hypotension on a background of 7 days of vomiting and constipation. He was not obviously in pain. He had a raised white cell count of $24.8 \times 10^9/l$, and a lactate of 2.2 mmol/l. A chest x-ray had the appearance of free air under the diaphragm and he was suspected of having a bowel obstruction with perforation. An abdominal CT scan showed instead a large fluid and gas-filled hepatic abscess, and a second smaller simple cyst. The abscess was percutaneously drained, and the purulent fluid drained grew *Streptococcus milleri*. The patient was discharged home 2 weeks later.

BACKGROUND

Liver abscesses are estimated to occur with an incidence of 2.3/100 000/year in the UK.¹ It is a treatable life-threatening disease.² With diagnosis and modern management, the death rate is now between 0% and 19%.^{3–5} Liver abscesses typically present with non-specific and vague symptoms of fever, weight loss, nausea and vomiting and anorexia⁶ and thus are an important differential diagnosis. In this case, the appearance of free air under the diaphragm coupled with the history suggested that the patient had a bowel perforation secondary to malignancy. CT of the abdomen as well as microscopy and culture of the drained fluid was instrumental in getting a diagnosis, which greatly affected the treatment, and prognosis for the patient.

CASE PRESENTATION

A 69-year-old man was referred to the accident and emergency department with a diagnosis of suspected atrial fibrillation with rapid ventricular response made by a general practitioner. Further questioning revealed a 2-month history of intermittent abdominal pain, anorexia, weight loss and malaise. He reported losing 10 kg over the last 2 months. He had collapsed three times and so had ceased his antihypertensives. He spent the last 7 days vomiting, with typically four episodes per day and constipation. He had been passing flatus. He also reported 4 days of worsening shortness of breath and light-headedness. His medical history included hypertension, paroxysmal atrial fibrillation, symptomatic first degree heart block for which he had a pacemaker in situ and benign prostatic hypertrophy. Medications included metoprolol, doxazosin, lisinopril, hydrochlorothiazide, digoxin and terazosin. He had never been a smoker, with minimal alcohol consumption and lived alone. He had been a space research scientist who had recently moved to London from California.

On examination he had a respiratory rate of 20 with shallow breaths. His lungs were clear to auscultation. He had a pulse rate of 140 bpm, blood pressure 110/80 mmHg and pitting oedema to his knees. He was afebrile, alert and orientated. His abdomen was distended, firm and with sparse bowel sounds. He was cachectic but not jaundiced.

A diagnosis of intra-abdominal malignancy and/or sepsis was suspected, and urgent bloods, a chest radiograph and abdominal CT scan arranged. He was initially treated with a fluid bolus, ceftriaxone, metronidazole, gentamicin and paracetamol. He had a white cell count of $24.8 \times 10^9/l$ and a lactate of 2.2 mmol/l. The chest radiograph had the appearance of free air under the diaphragm (figure 1).

The abdominal CT scan showed a large liver abscess, with a second smaller simple cyst not shown (figure 2).

INVESTIGATIONS

Chest radiograph with the appearance of free air under the diaphragm. Abdominal CT scan showing a large liver abscess $21 \times 17 \times 16$ cm with an air fluid level within the right lobe, with a second smaller 1.1 cm simple cyst in segment VI. There was no evidence of cholecystitis, diverticulitis or other intra-abdominal infection.

DIFFERENTIAL DIAGNOSIS

Pyogenic abscess, amoebic abscess, fungal abscess, hydatid cyst, metastatic and primary hepatic tumours, cholecystitis, and gastritis.

Figure 1 The chest radiograph with the appearance of free air under the diaphragm.

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Figure 2 The abdominal CT scan showed a large liver abscess, with a second smaller simple cyst not shown.

TREATMENT

Percutaneous drainage and antibiotics.

OUTCOME AND FOLLOW-UP

The surgical team, a gastroenterologist and interventional radiologist were contacted and the patient had a percutaneous drain inserted successfully, releasing purulent fluid which was sent to microscopy where it was identified as *Streptococcus milleri*, a species of the α -haemolytic *Streptococcus viridans* and a Gram-positive microaerophilic, which on blood agar often appears as small minute colonies. The patient completed a course of β -lactam antibiotics and made a good recovery. He was discharged home after 2 weeks, with further follow-up.

DISCUSSION

Liver abscesses are an acquired disease generally classified into amoebic abscesses caused by the parasite *Entamoeba histolytica*,⁷ and pyogenic abscesses.⁸ Pyogenic abscesses may be bacterial or fungal. They often can be attributed to bacterial infections of the biliary tree such as cholangitis,⁹ or more distally in the body such as diverticulitis or inflammatory bowel disease,¹⁰ where infection may migrate to the liver via the portal vein system. Bacterial endocarditis, dental infections, fungal infections, cirrhosis,¹¹ blunt trauma¹² and foreign bodies¹³ are other causes. No cause is found in up to 15% of cases. In one retrospective 10-year Australian study¹⁴ in order of frequency, the most common pathogens cultured from the abscess contents were *Streptococcus milleri* (25%), *Klebsiella pneumonia* (21%) and *Escherichia coli* (16%). Risk factors for their formation include intra-abdominal infections, liver biopsy, a blocked biliary stent, immunocompromisation, cirrhosis and existing cancer. While the disease often mimics cancer with symptoms such as fevers, night sweats¹⁵ and anorexia,¹⁶ CT and ultrasound provide the diagnosis with a high sensitivity and specificity.^{17–20} A chest radiograph is useful if there are any chest symptoms or signs of diaphragmatic irritation. Our patients' abscess was at the right hemidiaphragm which is the most common side for abscess formation.²¹ The gas-filled abscess gave the appearance of free air on chest radiograph, and sufficiently irritated the diaphragm to cause tachypnoea, and an alkalotic picture on venous blood gas analysis (pH 7.53, pCO₂ 2.2). Important other basic laboratory studies included full blood count, serum albumin, bilirubin, alkaline phosphatase levels, PT and aPTT. These studies^{22–23} are often abnormal and were in this case. Blood

cultures are crucial to guide antibiotic therapy. While the clotting studies are disordered, aspiration and drainage are relatively contraindicated. Aspiration and radiologically guided drainage, with an appropriate course of antibiotics and antifungals if a fungal abscess is suspected, guided by microscopy, culture and sensitivity studies resolves most liver abscesses; however, a small percentage require further surgical intervention such as laparotomy.²⁴ Several studies point to either a co-committant cancer,²⁵ or an increased risk of colorectal cancer after a liver abscess diagnosis²⁶ with one study²⁷ reporting an adjusted HR of colorectal cancer of 2.7 times for patients diagnosed with a *K pneumonia* liver abscess compared to the normal population, and suggest that further studies should be undertaken for the detection of occult cancers in these patients. A liver abscess may herald malignancy.

Learning points

- ▶ Liver abscesses may mimic malignancy and therefore are an important differential to consider when presented with the clinical signs of pain, fevers and weight loss.
- ▶ The appearance of free air under a diaphragm on chest radiograph is not always bowel perforation.
- ▶ Liver abscesses are often successfully treated with radiological percutaneous drainage and antibiotics.

Competing interests None.

Patient consent Obtained.

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