

Case Report

An unusual case of sepsis: liver abscess masquerading as pneumonia

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Abstract

A 63-year-old woman presented with fever, tachycardia and tachypnoea, with right sided chest and hypochondrial pain. Chest radiograph showed right basal consolidation and she was treated for community acquired pneumonia with intravenous antibiotics. Subsequent clinical deterioration in presence of a previous history of complicated diverticulitis, persistent right hypochondrial pain and deranged liver function tests prompted further investigations that confirmed presence of a large pyogenic liver abscess. Following appropriate antibiotic treatment and image guided drainage of the abscess, the patient made a complete recovery. This case illustrates the importance of considering a subdiaphragmatic source of sepsis even in the presence of chest radiographic abnormalities, when a patient fails to respond to initial treatment for pneumonia.

Keywords

Community acquired pneumonia, pyogenic liver abscess, sepsis, antibiotic therapy

Key points

- Severe sepsis due to community acquired pneumonia (CAP) is a common cause of admission to the acute medical unit with a high mortality if treatment is delayed
- Failure to respond to initial therapy for CAP should prompt escalation of care and consideration of an alternative source of sepsis
- A prior history of diverticulitis and right upper quadrant pain should raise the suspicion of liver abscess, even in the presence of clinical and radiographic signs of pneumonia
- Early imaging and drainage of liver abscess will enable the source of sepsis to be controlled and appropriate antibiotic therapy to be instituted

Case report

A 63-year-old woman presented to the emergency department with two days of intermittent fever, shortness of breath, right sided pleuritic chest pain and localised pain over the right upper quadrant of her abdomen. She reported episodes of night sweats and rigors for one week prior to the admission. She also had lethargy, reduced appetite, and nausea for about 4 weeks. Her past history included diverticulitis complicated by peritonitis requiring laparotomy and temporary colostomy in 2005 with reversal of colostomy, and hernia repair in 2008.

On initial assessment, her temperature was 38.3°C, with a heart rate of 140/minute, and a respiratory rate of 33/minute. The blood pressure was 145/85 mm of Hg. Coarse crackles were audible over her right lower chest. Abdominal and neurological examinations were unremarkable, with no palpable masses or organomegaly and no significant abdominal tenderness. With a presumptive diagnosis of severe sepsis of respiratory origin, she was commenced on intravenous Piperacillin/tazobactam. The “Sepsis Six” components were completed within one hour of presentation, including blood cultures and measurement of serum lactate.

Initial biochemical and haematological laboratory investigations are shown in Table 1.

Chest radiograph showed consolidation of right mid and lower zones of the lung suggestive of pneumonia (Figure 1). Abnormal liver function studies were initially attributed to sepsis and the antibiotic treatment for community acquired pneumonia (CAP), and fluid management for sepsis and the related acute kidney injury were continued.

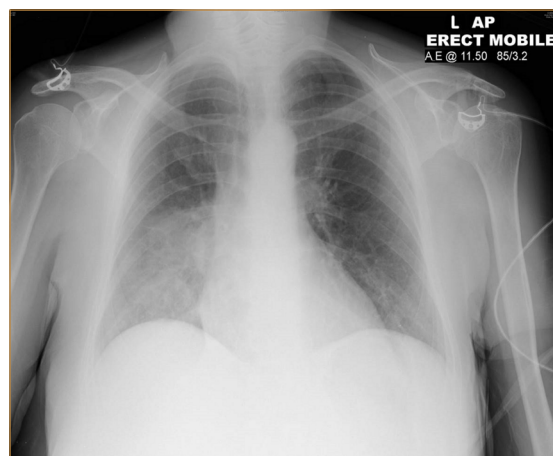


Figure 1. Chest radiograph showing right mid and lower zone consolidation

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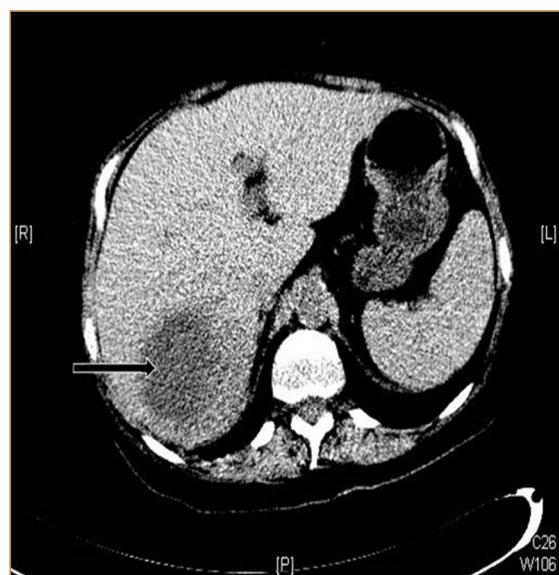
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Table 1. initial laboratory investigations

Laboratory parameter	Case	Normal range
Haemoglobin	97 g/L	130-160 Gram/L
White cell count	23.9 x 10 ⁹	4 – 11 x 10 ⁹
Platelets	321 x 10 ⁹	150 – 300 x 10 ⁹
Blood urea	10.6 mmol/L	2.5 – 6.6 mmol/L
Serum creatinine	145 mmol/L	88 – 128 mmol/L
Bilirubin	16 mmol/L	3 – 20 mmol/L
Alkaline phosphatase	424 units/L	44 – 147 units/L
Alanine aminotransferase	32 units/L	7 – 40 units/L
Albumin	30 Gram/L	35 -50 Gram/L
pH	7.43	7.35 – 7.45
pO ₂ (while on 15 litres/ minute oxygen)	19.4 kPa	10.5 – 13.5 kPa
pCO ₂ (while on 15 litres/ minute oxygen)	2.1 kPa	5.1 – 5.6 kPa
Lactate	9.1mmol/L	< 2 mmol/L

**Figure 2.** Computed tomographic scan showing right lobe hepatic abscess (arrow)

On the following day, patient became hypotensive and she was transferred to the high dependency unit (HDU) for ongoing care. She continued to describe right hypochondrial pain, but abdominal examination remained unremarkable with no peritonism, hepatomegaly or palpable mass. In view of her previous history of diverticulitis and abnormal liver function tests, a computed tomographic scan of the abdomen was undertaken. This revealed a large thick-walled, loculated, hypoattenuating lesion of size 7.8 x 7 x 5.6 centimetres in the right lobe of liver (Figure 2) with evidence of right basal lung consolidation. The remainder of abdominal organs were normal. The appearances were suggestive of

right lobe hepatic abscess, and 200 ml of pus was drained under fluoroscopic guidance. Intravenous metronidazole was added to the treatment regimen, as advised by our local microbiologist. She did not require inotropic or renal/ ventilatory support in HDU, and with prompt improvement of her clinical condition, she was transferred back to acute ward on the following day. Bacterial blood cultures later grew diphtheroids and *propionibacterium* species with antimicrobial sensitivity to Piperacillin/ tazobactam. Pus culture studies from the drained liver abscess were later reported to grow mixed anaerobes including *Propionibacterium*, sensitive to metronidazole.

The intravenous antibiotics were discontinued on the 6th day of her admission and were substituted by oral co-amoxiclav and metronidazole for 9 more days as advised by the microbiologist. The renal and liver function tests improved with treatment and were back to normal in a week. A subsequent ultrasonography of abdomen after 2 weeks of initial admission revealed complete resolution of the liver abscess. The patient was discharged home with full recovery after two weeks.

Discussion

The initial presentation in this patient was highly suggestive of severe sepsis due to CAP which appeared to be confirmed by the chest radiograph. Pneumonia is most common cause of sepsis, accounting for 64% of cases from one of the largest series ever reported.¹ Initial antibiotic selection is a key element in early management of CAP;^{2,3} most UK hospitals have policies to guide clinicians based on local sensitivities, and efficacy. Regular patient review is essential to enable treatment to be revised,

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escalated or reduced, according to the patient's response.⁴

In this case, clinical deterioration despite broad spectrum antibiotic therapy led to escalation of her care to HDU and prompted for additional investigations. Persistent right hypochondrial pain and deranged liver function tests prompted us to consider an intra-abdominal source of sepsis although diaphragmatic pleurisy due to right lower lobe pneumonia can result in such a clinical picture. Pyogenic liver abscess (PLA) is a global public health problem with an overall incidence of 1.1 – 3.6 per 100,000 population, associated with high morbidity and mortality.⁵ The classic triad of fever, right upper quadrant pain and malaise may not be always present. Many patients present with nonspecific clinical features such as diarrhoea, jaundice, right pleural effusion, anorexia, nausea, and vomiting.^{6,7} Between 14 – 25% of patients describe respiratory symptoms such as cough, chest pain or dyspnoea and/or signs of pneumonia, as in our case.⁷ The index of suspicion in our case was also raised by the previous history of complicated diverticulitis and abdominal symptoms predating the onset of respiratory illness.

Diverticular disease increases the risk of PLA because of portal pyemia resulting from pus-forming organisms, released from the colon during acute or subacute inflammatory phase of the disease. The adjusted hazard ratio (aHR) of PLA was 2.11 (95% confidence interval [CI], 1.81-2.44) in patients with diverticular disease compared to controls, according to a multivariate Cox proportional hazards regression model in a large nation-wide

cohort study reported from Taiwan.⁸ The aHR was highest in patients younger than 50 years old (4.03; 95% CI, 2.77-5.85). The study data also revealed that diverticular disease increased PLA risk regardless of previous diverticulitis.

Diphtheroids and *Propionobacterium* species are common skin commensals, which may sometimes contaminate blood cultures. The finding of *Propionobacterium* in the pus aspirated from the liver abscess confirmed this as the likely pathogen (along with other anaerobes). Management of severe sepsis requires recognition and treatment of the source of infection.⁹ In the case of liver abscess, percutaneous aspiration is essential and in this case resulted in a rapid clinical improvement, which may have been life-saving. Administration of appropriate antibiotics with advice from the microbiologist also might have contributed to a quick recovery. Delays in the diagnosis, drainage and institution of appropriate antibiotic therapy are associated with high morbidity and mortality in PLA.¹⁰

Funding

No funding received for this work

Acknowledgments

We are thankful to Dr. Joseph M Pappachan, University of Lancaster for critically reviewing the manuscript and suggesting modifications that improved the quality of the paper substantially.

Conflicts of interest

None.

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