IMAGES IN THORAX

Bilious pleuritis following transpulmonary radiofrequency ablation of liver metastases

Asli Kalin,[1] Maged Hassan,[2] Mark Anderson,[3] Najib Rahman[2]

[1]Department of Respiratory Medicine, John Radcliffe Hospital, Oxford, UK
[2]Oxford Respiratory Trials Unit, Oxford Centre for Respiratory Medicine, University of Oxford, Churchill Hospital, Oxford, UK
[3]Department of Radiology, University of Oxford, Churchill Hospital, Oxford, UK

Correspondence to
Dr Maged Hassan, Oxford Centre for Respiratory Medicine, Oxford Respiratory Trials Unit, University of Oxford, Churchill Hospital, Roosevelt Drive, Oxford OX3 7LE, UK;
maged.fayed@ouh.nhs.uk, magedhmf@gmail.com

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A 55-year-old man with pancreatic cancer metastatic to the liver underwent percutaneous radiofrequency ablation (RFA) of the liver deposits. The liver harboured four metastatic foci, the largest of which was located at the posterior part of the right lobe just below the diaphragm (figure 1A). Due to the difficult anatomic location, transpulmonary approach was chosen for RFA and CT guidance was needed rather than ultrasound.

Under CT guidance an Accu 2i probe (Acculis Microwave Tissue Ablation System, AngioDynamics, Latham, New York, USA) was advanced into the four liver metastases. Ablation was performed at 140W at multiple sites for a total of 50 min. Small subcapsular haematoma was identified at the end of procedure but no pneumothorax. A biliary metal stent was inserted at the time of the procedure and the patient was discharged home on prophylactic antibiotics.

Six days later, the patient presented with right upper quadrant and right-sided pleuritic chest pain. Physical examination and chest radiograph were consistent with a right-sided pleural effusion. Pleural aspirate under ultrasound guidance confirmed an acidic effusion (pH 6.5) and fluid culture grew gastrointestinal tract bacteria (*Enterococcus faecum*, *Escherichia coli*). The pleural infection was treated with intercostal drainage that demonstrated green fluid (figure 1B,C), and the pleural fluid bilirubin level was 185 µmol/L. The patient was treated with 6 weeks of intravenous antibiotics.

The presence of bilious fluid and gastrointestinal organisms in the pleural space suggests a communication between the liver and the pleural space. This was confirmed on CT imaging where a communication was identifiable at the location where ablation had been performed (figure 2A,B). In addition, radiological images supported the diagnosis of pleural infection.

DISCUSSION

The pleural space is vulnerable to disruption (injury) as consequence of trauma to or manipulation of various gastro-intestinal organs, including the pancreas, oesophagus and liver. In most cases, such effusions are sympathetic to contiguous inflammation. Less commonly they occur due to spillage of internal contents into the pleural space after a breach of integrity of these organs. Pleural effusion secondary to percutaneous RFA of liver lesions is not commonly encountered when the transhepatic approach is used. The procedure has been reported to be complicated by pleural effusion in less than 0.5% of cases, but these effusions tend to be refractory.[1] The transpulmonary approach for RFA, however, can be complicated by pleural disease in about one-third of cases, and in particular by pneumothorax.[2]

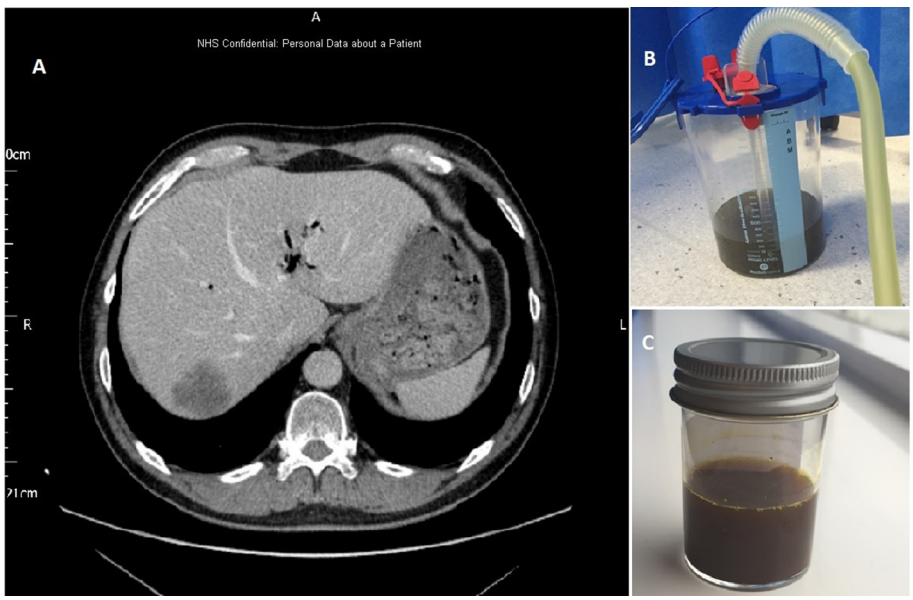

Figure 1 (A) The main metastatic deposit at the posterior portion of the right liver lobe. (B,C) Bile-stained pleural fluid drained.

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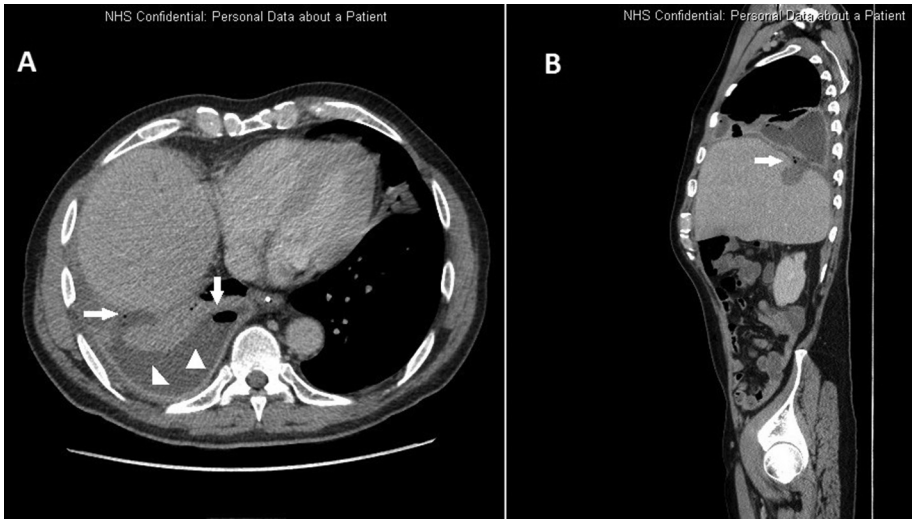

Figure 2 Postcontrast chest CT. (A) Axial cut in the lower chest reveals right pleural effusion with evidence of air bubbles (arrows) strongly suggesting infection. Also, note the pleural enhancement (arrowheads) denoting intense inflammation. (B) Para-sagittal reconstruction clearly delineates transdiaphragmatic communication (arrow) between fluid collection inside the liver substance and the supradiaphragmatic space.

Bilio-pleural fistula formation and resulting bilious pleuritis is a recognised complication following percutaneous hepatic and biliary intervention. The use of metal biliary stent increases the risk of infection postprocedure. Bilious effusion is suspected by its physical appearance along with a compatible history of injury to the biliary tract. Firm diagnosis is made by a pleural:serum bilirubin ratio of >1. In the reported case, the physical and biochemical characteristics were suggestive, but CT images provided compelling evidence. Infection complicates 50% of cases of bilious effusion and is usually associated with bowel organisms.[3]

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