

Thoracic Complications of Radiofrequency Ablation of Recurrent Hepatoma

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Abstract

Introduction: Radiofrequency ablation (RFA) for unresectable primary or secondary hepatic malignancies have gained widespread availability and acceptance over the past 5 years. Complication rates have been reported to range from 0% to 27%. **Clinical Picture:** We report a patient with symptomatic right pleural effusion due to a diaphragmatic fistula and another with biliptysis post-RFA, for recurrent hepatoma. **Treatment:** Percutaneous drainage of both the pleural effusion and biloma was performed. However, surgical repair of the diaphragmatic fistula was only required for the former for persistent drainage. **Outcome:** Both patients were successfully treated with minimal morbidity. **Conclusion:** High index of suspicion is required for the early diagnosis and treatment of diaphragmatic fistulas. Simple catheter drainage can potentially obviate the need for surgery.

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Introduction

Radiofrequency ablation (RFA) intended to produce complete thermal necrosis of unresectable primary or secondary hepatic malignancies have gained widespread availability and acceptance over the past 5 years.¹ Complication rates are low with less than 1% procedure-related mortality. Nevertheless, this therapeutic modality remains a palliative option.² We report 2 patients with diaphragmatic fistulas post-RFA for recurrent hepatoma.

Case Reports

Case 1

A 75-year-old man was referred for the problem of recurrent right pleural effusion. He had undergone left hepatectomy 4 years earlier for a 3.1 x 2.7 cm Couinaud's segment IV hepatocellular carcinoma identified following a raised alpha fetoprotein (AFP) level found on health screening. Adjuvant intra-arterial rhenium-188 via selective hepatic angiography was also given postoperatively.

Follow-up magnetic resonance imaging (MRI) of the liver performed in November 2003 revealed 2 lesions suspicious of tumour recurrence in segment V and VIII respectively. The segment VIII lesion (in the dome of the liver) measuring 13 to 14 mm also had borderline fluorine-18-labelled fluoro-2-deoxy-D-glucose (F-18 FDG) uptake

on positron emission tomography (PET).

In view of his raised AFP level, RFA and chemo-embolisation of the lesions were performed. Computed tomography (CT) in November 2004 confirmed stability of the areas of coagulation necrosis, but identified 2 new lesions; 1 in segment VIII (just beneath the dome of the diaphragm), and the other at the junction between segments VII and VIII (at the periphery). AFP was 376 ug/L.

CT-fluoroscopic guided RFA of the hypervascular lesion in segment VIII was performed using 2 standard 12-minute cycles of ablation with repositioning of the electrode between ablations. The other suspicious hypodense lesion located inferior and posterior was ablated once. Two weeks later, a small right pleural effusion was noted on CT scan.

The pleural effusion worsened and he became symptomatic. It was subsequently drained with a pig-tail catheter, but in view of persistent drainage, he underwent video-assisted thoracoscopic repair of 2 diaphragmatic fistulas (Fig. 1).

Case 2

A 42-year-old man post-hepatoma resection in 2000, presented with tumour recurrence in 2005 treated with RFA. Concomitant biliary stricture with obstructive jaundice was drained with biliary stent in situ.

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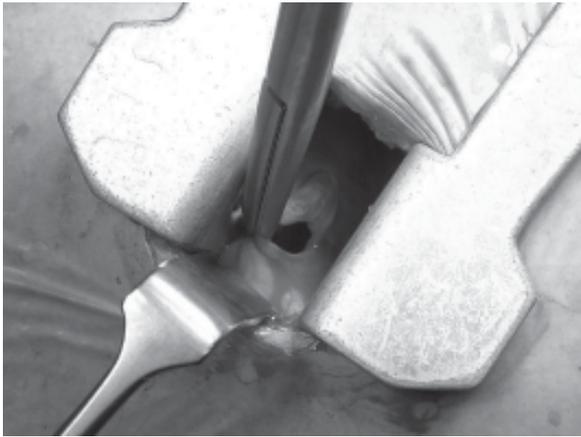


Fig. 1. One of 2 large diaphragmatic fistulas seen.

Shortly after, he presented with cough productive of bile-stained sputum. Bile was confirmed on testing of his sputum. CT revealed a biloma adjacent to segment 8, extending supra-diaphragmatically to the right hemi-thorax where it was inseparable from the right lower lobe consolidation. Fluid suspicious for bile was also seen in the right lower lobe bronchus (Fig. 2).

He was treated with percutaneous drainage of the biloma and antibiotic therapy. Contrast injection during the catheterisation opacified an irregular cavity and confirmed a fistulous communication with the right bronchial tree. He continued to improve with subsequent removal of the drainage catheter following confirmation of the resolution of the fistula. He was readmitted 2 months later for recurrent biloma, fever and biliptysis (reduced severity) requiring reinsertion of percutaneous drainage catheter with subsequent resolution.

Discussion

Curley et al,¹ at MD Anderson, Houston, Texas, in collaboration with the Pascale National Cancer Institute in Naples, Italy, studied 608 consecutive patients. They reaffirmed an overall low (<10%) complication rate in patients undergoing radiofrequency ablation.

Nevertheless, incomplete understanding of variables such as total current delivery in relation to tissue volume, peak temperatures at the tumour margin, and extent of the zone of necrosis increases the potential danger of RFA, especially in large central tumours located in the posterior medial aspects of segment V, VIII, or IVb.²

The majority of patients have radiographic evidence of right pleural effusion following either open or percutaneous RFA of right-sided liver tumours. One study reported that symptomatic pleural effusion in the first 30 days occurs in 1.8% of patients, but all improved with thoracocentesis and/or diuresis within 3 weeks.¹ A diaphragmatic fistula secondary to thermal injury of the adjacent diaphragm is

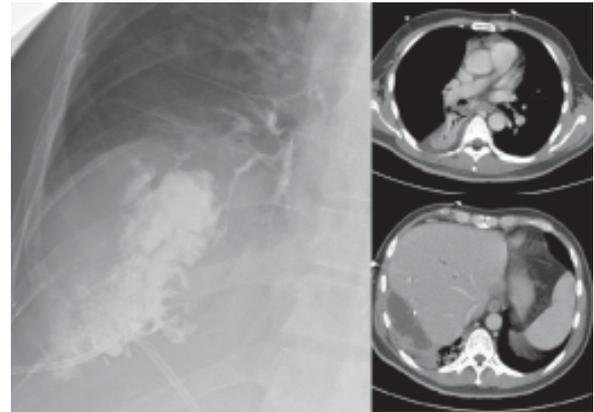


Fig. 2. Contrast injection via drainage catheter showing the irregular cavity of the biloma and fistulous communication with the right bronchial tree.

rare, but has to be considered as it requires more specific measures such as direct repair and pleurodesis.

Broncho-biliary fistula has been well described in association with infection (especially hydatid disease) and malignancies in the liver. Fistulas resulting from transcatheter chemoembolisation or, more recently, radiofrequency ablation of hepatomas are thankfully rare. Nevertheless, it does pose a challenging diagnostic problem for the inexperienced.

Conclusion

Although complication rates of RFA are low, the morbidities associated with them are high and often require intervention and prolonged hospitalisation. A recalcitrant right pleural effusion is a clue to the potential presence of a diaphragmatic fistula. We cannot overemphasise the need to simply inspect the patient's sputum especially in this clinical context, as a high index of suspicion is key to early diagnosis and treatment.

We advocate simple drainage of the fistulous cavity (thoracic or intraperitoneal) at first instance, to allow for adhesions to "heal over" small fistulas, and secondly to obtain specimens for microbiological testing. Surgical repair would only be required for persistence of clinical symptoms, and should only be performed in the absence of sepsis because the diaphragm may require prosthetic mesh reconstruction.

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