CASE REPORT

Left atrial-oesophageal fistula: a very rare, potentially fatal complication of radiofrequency ablation for atrial fibrillation

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SUMMARY

A 56-year-old man underwent radiofrequency ablation for atrial fibrillation. Four weeks later he presented with sepsis and neurological symptoms. Urine analysis demonstrated the presence of blood and protein. A CT scan showed pockets of air in the left atrium. An MRI brain scan revealed multiple cerebral abscesses. The patient developed a third heart sound and splinter haemorrhages. He was subsequently referred to cardiology for transoesophageal echocardiography after starting a course of intravenous meropenem. The cardiology team noted that this individual presented with a triad of infections, neurological sequelae and air in the left atrium after an ablation procedure and diagnosed atrio-oesophageal fistula. A decision to operate was made 9 days after admission. At surgery an area of caseous ulceration was found on the posterior wall of the left atrium overlying the oesophagus. PCR analysis revealed *Mycoplasma salivarium*, part of the oral flora.

BACKGROUND

Atrioesophageal fistulae are lethal without urgent surgical treatment. The vast majority of patients present to stroke units or infectious disease units and not cardiologists thus the diagnosis is not made. The major differential to be considered is infective endocarditis; however, investigation by transoesophageal echocardiography (TOE) leads to poor outcome. This case highlights the steps to identify the disease and stresses the need for emergency surgery.

CASE PRESENTATION

A 56-year-old man, with a family history of Brugada syndrome underwent pulmonary vein isolation and wide area circumferential radiofrequency (RF) ablation for persistent atrial fibrillation (AF) due to hypertension. He had no symptoms or ECG evidence to suggest he suffered from Brugada

Figure 1 (A) MRI of the patient's head demonstrating the intracerebral abscesses. (B) Intracardiac air suggestive of a fistula. (C) Operative photograph demonstrating the ulcerated lesion overlying the oesophagus on the posterior wall of the left atrium.

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syndrome. Echocardiography performed 24 h after the procedure was normal and he was discharged with routine follow-up.

Four weeks later, prior to any follow-up appointment, he developed rigours and neurological symptoms. He had no gastrointestinal symptoms of note. He was referred to the stroke unit where a diagnosis of transient ischaemic attack and a viral illness was made and he was discharged. Two days later he was admitted to the Infectious Diseases Unit with confusion, amnesia and continuing fever. On admission his temperature was 39°C. The clinical examination was unremarkable and he was haemodynamically stable (blood pressure 113/78 mm Hg; heart rate 90/min sinus rhythm). Baseline blood investigations showed evidence of sepsis (C reactive protein 257, total white cell count 12.2×10^6). A urine analysis demonstrated the presence of blood and protein.

INVESTIGATIONS

CT of the chest, abdomen and pelvis were performed to investigate for a source of sepsis. This showed pockets of air in the left atrium (figure 1A: red arrow) which were considered to be iatrogenic. Owing to his neurological symptoms an MRI of the brain was conducted which showed multiple intracranial rounded lesions with surrounding oedema consistent with cerebral abscesses (figure 1B: yellow arrow). He was started on an extended course of intravenous meropenem. The infectious diseases team noted that he had developed a third heart sound and splinter haemorrhages in his right thumb and right toe and considered the diagnosis of infective endocarditis. He was therefore referred to cardiology for TOE to confirm the diagnosis.

TREATMENT

A decision to operate was made within 2 days of being at the cardiac unit, 9 days after admission to the medical assessment unit. At surgery an area of abnormal caseous material was found on the posterior wall of the left atrium, with a central ulcerated lesion overlying the oesophagus and the site of gas bubble seen on CT (figure 1C: black arrow). No sinus of fistula was identified, although the clinical impression preoperatively was that the fistula had already closed. The atrial wall was debrided and an autologous pericardial patch used to exclude the area. Microbiological culture of the tissue was negative; however, PCR analysis revealed *Mycoplasma salivarium*, which is part of the oral flora. The postoperative recovery was uneventful, with no residual neurological deficits. Intravenous meropenem was continued for 6 weeks to treat his cerebral abscesses.

DISCUSSION

Atrioesophageal fistula is an extremely rare complication of RF ablation with only 35 cases reported in the literature.^{1–4} It has an incidence of approximately 0.03%.⁵ The lag period between the development of this fatal complication postprocedure can be as little as 3 days or as much as 2 months.^{1–6} Owing to the rarity of the condition and the subsequent lack of awareness there is usually a fatal delay in the diagnosis. Patients present with a triad of fever, neurological symptoms and recent history of RF ablation or cryoablation. Cultures are positive for Gram-positive bacteraemia. The majority of patients can be diagnosed by chest CT scans which show air in the left atrium or damage to the oesophagus.⁷ A transoesophageal echo should never be attempted in these cases as it is associated with further injury and poor outcome.² Only in one case was the CT scan not

diagnostic, however in this case the MRI of the brain revealed the diagnosis.⁸ Brain MRIs display septic emboli or air emboli. Without surgery, the mortality rate is 100%. Of 16 patients treated surgically 9 (56%) survived although 3 of these had neurological deficits postoperation.^{1–9–10}

Individuals with this complication after RF ablation of AF rarely present to electrophysiologists or even cardiologists and are more likely, as in the case we report, to present to an infectious diseases unit or stroke unit. This can lead to fatal delays in diagnosis. This case highlights the need for a high degree of clinical suspicion when investigating patients with sepsis and neurological signs following AF ablation. This rare but serious complication of the technique is survivable if diagnosed early and treated surgically, but fatal if the diagnosis is missed or delayed.

Learning points

- ▶ Atrioesophageal fistula is a recognised but rare complication of atrial fibrillation (AF) ablations and are fatal without treatment.
- ▶ An atrioesophageal fistula should be suspected early if a patient presents with a triad of recent history of AF ablation, neurological symptoms and fever.
- ▶ The investigation of choice is CT of the chest and MRI of the head. Transoesophageal echo must be avoided at all costs.
- ▶ Atrioesophageal fistulae can only be treated with urgent surgery.

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