Pyopneumopericardium secondary to pericardio-oesophageal fistula following radiofrequency ablation of atrial fibrillation

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Case description

A 64-year old woman underwent radiofrequency AF ablation by wide area circumferential ablation. Three weeks following the procedure, she was readmitted with possible sepsis, though focus of infection was unclear. A nasogastric tube was passed, and chest radiography performed to assess its position, which demonstrated a large pneumopericardium (Figure 1A) not present on admission (1B). A thoracic CT scan with oral contrast demonstrated large volume pneumopericardium and a large pericardial effusion, with thin septae noted (Figure 2). There were appearances suggestive of gas locules and extraluminal contrast anterior to the oesophagus, which pointed towards a possible oesophageal leak. The patient underwent emergency surgery within 24 hours. A significant amount of pus was found within the pericardial space, which grew candida on microbiological analysis, though no fistula between the pericardium and the oesophagus, nor clear evidence of oesophageal perforation, was found. The pericardial space was washed out and pericardietomy performed, with no oesophageal repair needed. The patient was treated with antifungal medications with a subsequent CT scan confirming resolution of the pyopneumopericardium (Figure 3). Although no clear perforation or fistula was demonstrated during surgery, a pericardio-oesophageal fistula that had sealed off by the time of surgery remained the most likely diagnosis. Atrio-oesophageal fistula (AOF) formation is a rare but recognized serious complication of AF ablation associated with a mortality rate in excess of 70% (1-3), with pericardio-oesophageal fistula formation being a variant of this complication. AOF occurs in <0.1% of AF ablation cases, often presenting 1-4 weeks following ablation with fever and features of sepsis, with neurological symptoms from air emboli, gastrointestinal symptoms, or with striking radiological findings of air in the pericardium or mediastinum, as illustrated in this case (1-4). The surgical procedure was not technical-demanding, and urgent surgical intervention should be considered in patients presenting with symptoms of AOF.
References:


Figure 1: Pneumopericardium on chest radiograph: (A) The chest radiograph shows lucency around the heart consistent with air within the pericardial space (white arrow), which was not present on the admission chest radiograph (B).
Figure 2: Large volume pneumopericardium and a large pericardial effusion seen on thoracic CT scan: (A) Coronal section, (B) sagittal section, and (C & D) axial sections of thoracic CT scan. Air (white arrow) is clearly seen within the pericardial space in all four panels, with septae also seen within the pericardial space in panels A. The horizontal cross-section images (C & D), show air and fluid (*) within the pericardial space and bilateral pleural effusions (stars). In panels B and D, air locules (solid black arrows) can be seen anterior to the contrast filled oesophagus (dashed black arrows), suggestive of an oesophageal perforation and leak.
**Figure 3: Repeat chest radiograph and thoracic CT scan following surgery:** Repeat imaging demonstrating resolution of the pyopneumocardium following surgery. (A) Repeat chest radiograph, and (B) sagittal, (C) axial and (D) coronal sections from repeat thoracic CT scan.