

When the Dreaded Happens: Atrio-esophageal fistula post Atrial Fibrillation Catheter Ablation

Aamer Ubaid¹, Vinay Jahagirdar¹, Yasser Sammour¹, Seba Hasan², Merrill Thomas³, and Robert E. Tanenbaum³

¹Department of Internal Medicine University of Missouri Kansas City Kansas City MO USA

²Department of Critical Care University of Missouri Kansas City Kansas City MO USA

³Department of Cardiovascular Disease St Luke's Mid America Heart Institute Kansas City MO USA

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Abstract

Though rare, atrio-esophageal fistula is the second most common complication of cardiac catheter ablation for atrial fibrillation; acute cardiac tamponade being the leading cause [1]. We report a case of a 64-year-old male with AEF after a catheter ablation procedure for AF, that proved to be fatal.

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Aamer Ubaid, M.D.¹, Vinay Jahagirdar, M.D.¹, Yasser Sammour, M.D. ¹, Seba Hasan, M.D. ², Merrill Thomas, M.D.³, M.Sc., Robert E. Tanenbaum, M.D.³

1: Department of Internal Medicine, University of Missouri Kansas City, Kansas City, MO, USA; 2: Department of Critical Care, University of Missouri Kansas City, Kansas City, MO, USA; 3: Department of Cardiovascular Disease, St. Luke's Mid America Heart Institute, Kansas City, MO, USA;

Corresponding Author:

Aamer Ubaid, M.D.

5429 Foxridge Dr, Apt 203, Mission, Kansas, USA 66202

+1-8164467488

Email aamerubaid@umkc.edu

Twitter handle @UbaidAamer

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Abstract

Though rare, atrio-esophageal fistula is the second most common complication of cardiac catheter ablation for atrial fibrillation; acute cardiac tamponade being the leading cause [1]. We report a case of a 64-year-old male with AEF after a catheter ablation procedure for AF, that proved to be fatal.

Keywords : Atrial Fibrillation, Catheter Ablation, Esophageal Fistula

Abbreviations : AEF=Atrio-esophageal fistula; AF=Atrial fibrillation; ECG=Electrocardiogram; MRI=Magnetic Resonance Imaging; TTE=Transthoracic Echocardiography; EF=Ejection Fraction; CSF=Cerebrospinal fluid; TEE=Transesophageal Echocardiography; ICU=Intensive Care Unit; ABG=Arterial Blood Gas; CT=Computerised Tomography

History of presentation

A 64-year-old male presented to the emergency department with a 1-day history of fever and chills associated with headache and intermittent episodes of confusion. Vitals were significant for temperature of 102 F, blood pressure 140/74 mm Hg, pulse rate of 92/min and respiratory rate 22/min. Physical examination showed an ill-appearing male, alert, and oriented with supple neck and no focal neurologic deficits. Rest of the systemic examination was unremarkable. ECG showed normal sinus rhythm. Chest X-ray showed no focal consolidation. CT head without contrast showed no evidence of intracranial hemorrhage, mass effect or acute territorial infarct. CT abdomen and pelvis without contrast showed thickening of distal esophagus concerning for esophagitis.

Past Medical History

Paroxysmal atrial fibrillation for which the patient underwent catheter ablation (successful posterior left atrial wall isolation) 5 weeks before presentation, Prior ablation procedure with pulmonary vein isolation 4 years prior; abdominal aortic aneurysm, coronary artery disease, hypertension, hyperlipidemia, type 2 diabetes, and deceased donor renal transplant for IgA nephropathy.

Differential diagnosis

Based on the initial assessment, differentials included pneumonia, meningitis/encephalitis, esophagitis and infective endocarditis.

Investigations

On day 2 of hospitalization, the patient's fever worsened to 104 F associated with tachycardia and tachypnea. He was disoriented with left-sided weakness. In view of his worsening lethargy and respiratory distress he was transferred to the ICU. ABG was consistent with metabolic acidosis. MRI head was concerning for intraparenchymal hemorrhage in the right medial cerebellar lobe and subacute cortical infarcts in the right frontoparietal lobe. TTE showed an EF of 42 % and mitral annular calcification with mild regurgitation but no evidence of infective endocarditis (Last TTE 1-year prior showed EF 60%). A lumbar puncture was performed, and CSF analysis revealed xanthochromia, neutrophilic pleocytosis and elevated protein concerning for CSF infection. Blood cultures grew gram-positive rods, *Lactobacillus rhamnosus* . A TTE did not show any definite vegetation or intracardiac thrombus.

Management

Patient was initially admitted to medicine floor and empirically started on vancomycin and cefepime, after obtaining blood cultures. On transfer to the ICU, his mental status worsened and had to be emergently intubated for airway protection. Norepinephrine and vasopressin were initiated for blood pressure support. Antibiotic coverage was broadened with meropenem and nystatin. Later, the patient developed ventricular tachycardia with hemodynamic instability requiring electric cardioversion. Amiodarone infusion was started. Given the recent history of catheter ablation for atrial fibrillation, a CT chest with contrast was ordered (Figure 1), which showed multiple air bubbles located between the esophagus and posterior aspect of the left atrium, concerning for atrio-esophageal fistula. Due to patient's neurological status, no surgical intervention was recommended by cardiothoracic surgery.

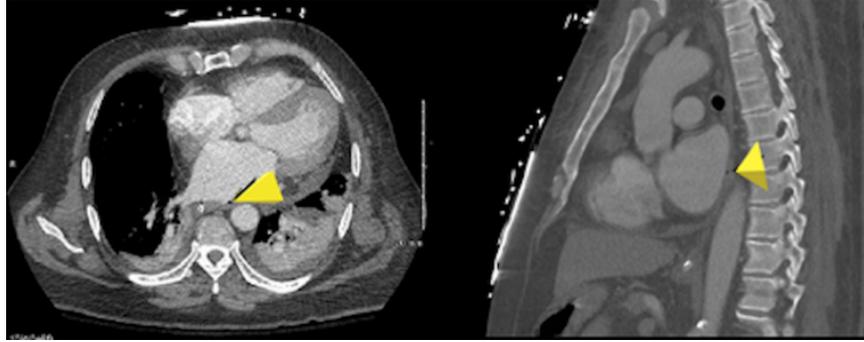


Figure 1: CT imaging. Multiple air bubbles seen between the esophagus and the posterior aspect of the left atrium, concerning for atrio-esophageal fistula (arrow in left frame). This is also associated with small pseudoaneurysm along the posterior wall of the left atrium (arrow in right frame).

Discussion

Ablation is one of the most frequently used treatment modalities for atrial fibrillation. AEF is a rare but dangerous complication of ablation, with an estimated occurrence in less than 0.1% - 0.25% of procedures.² The anatomical location of the esophagus posterior to the left atrium increases the likelihood of injury during the procedure. There is no clear understanding of the mechanism of esophageal injury, however direct thermal injury, acid reflux exacerbation, infection and ischemia have been described as some of the contributing factors.³ Attempts have been made to establish a relationship between the modality of ablation used and incidence of atrio-esophageal fistula. A higher association of esophageal injury was observed with percutaneous radiofrequency ablation, although it also has been reported with other energy sources, including cryoablation, high-intensity focused ultrasound, and surgical ablation.⁴⁻⁶ Robotic navigated-AF ablation has been documented to have higher incidence of esophageal injury when compared to manual ablation, when similar radiofrequency ablation parameters are used.⁷

Atrio-esophageal fistulae usually present 1 to 6 weeks after the procedure. Symptoms are nonspecific and include fever, malaise, chest discomfort, nausea, dysphagia, and odynophagia. CT and MR imaging of chest are considered gold standard diagnostic modalities since endoscopy in suspected cases can put the patient at risk of air embolus and neurological injuries. Early diagnosis can reduce morbidity and mortality since chances of recovery are higher before the esophageal perforation forms a communicating fistulous tract with the atrium.⁸ Once diagnosed, early surgical repair should be considered since mortality is almost 100 % without intervention.⁹

Follow-up

Given the multisystem dysfunction and continued septic emboli to the brain on repeat brain imaging, the prognosis was discussed with the family with the aid of the palliative medicine team, and he was transitioned to comfort care.

Conclusion

Atrio-esophageal fistula following AF ablation is a rare and life-threatening complication. Efforts should be made to establish guidelines for the safety of the procedures used for ablation along with close observation of the patient for any warning signs and symptoms following the procedure.

Learning Objectives

To consider and identify atrio-esophageal fistula as a complication of catheter ablation for atrial fibrillation

To recognise that early surgical intervention is necessary to prevent fatal outcomes in cases of AEF.

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