

## CASE REPORT

# A DEADLY TUNNEL: A CASE REPORT OF ATRIAL-ESOPHAGEAL FISTULA AFTER ATRIAL FIBRILLATION ABLATION

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### Abstract:

*The left atrial-esophageal fistula is an exceedingly rare but lethal iatrogenic complication after atrial fibrillation ablation. Variability in timing of clinical presentation may lead to delayed diagnosis of this fatal complication. It is crucial to have high clinical suspicion when patients present with new neurologic symptoms, chest discomfort or sepsis after ablation. This is a unique case of 78-year-old white man who presented with fever, hematemesis & confusion attributed to left atrial-esophageal fistula after ablation for medically refractory atrial fibrillation.*

**Key words:** Atrial-esophageal fistula, atrial fibrillation ablation, atrial fibrillation, cerebral air emboli.

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### Introduction:

The left atrial-esophageal fistula is an extremely rare iatrogenic complication that happens in between 0.03% to 0.08% of patients undergoing catheter ablation for atrial fibrillation.<sup>1,2</sup> The mortality rate is remarkably high, ranging from 67% to 100%.<sup>1,2</sup> A major reason for high mortality is failure to have rapid diagnosis.<sup>3,4</sup> It often occurs one to six weeks following the atrial ablation.<sup>3,4</sup> However, patients can present years after the ablation procedure that may lead to late diagnosis.<sup>1,4</sup> An initial presentation to the emergency room (ER) with nonspecific symptoms may not lead to timely correct diagnosis. For this reason, awareness about clinical presentation of this potential life-threatening complication can prompt timely management which could save our patient's life.

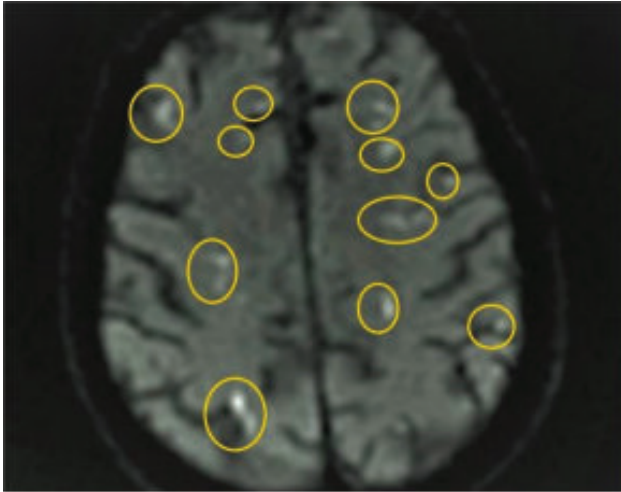
### Case Report:

A 78-year-old white man with a past medical history of paroxysmal atrial fibrillation status post 3 radiofrequency catheter ablations presented with fever, hematemesis, and confusion. One month prior to this admission, he underwent radiofrequency catheter ablation to treat refractory atrial fibrillation. The patient was stable after the procedure. Vitals on this admission are remarkable for the temperature of 102 F. Labs were significant for WBC of  $13.4 \times 10^3/\mu\text{l}$ , lactic acid 3.7 mg/dl. CT head without contrast showed no acute abnormalities. Then, emergency esophagogastroduodenoscopy (EGD) was done which revealed a 1 cm superficial ulcer in the mid-esophagus. He developed left hemiparesis two hours after the upper endoscopy. Brain magnetic resonance imaging (MRI) demonstrated multiple bilateral embolic infarcts both in cerebral and cerebellar hemispheres (Figure 1).

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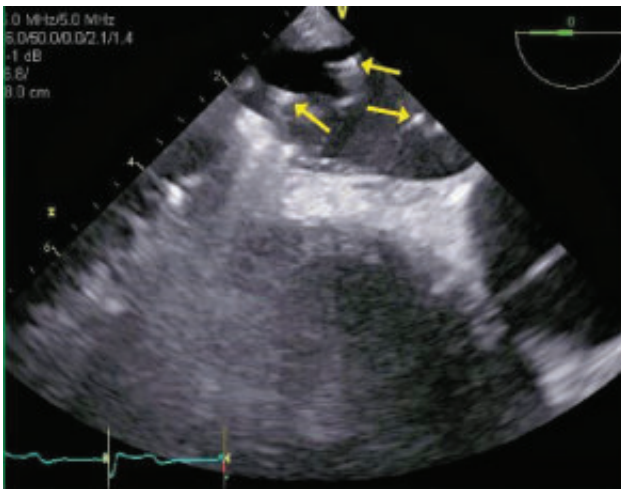
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**Figure 1:** MRI brain showing multiple bilateral embolic infarcts.

Blood culture grew *Streptococcus viridians*. Because of multiple bilateral embolic infarcts in MRI brain and positive blood culture, infective endocarditis was high in differential diagnosis. Therefore, a transesophageal echocardiography (TEE) was done which was unremarkable for vegetations and valve regurgitation. Of note, it revealed multiple air bubbles inside the left atrium, an unusual finding highly suggestive of left atrial-esophageal fistula (Figure 2).



**Figure 2:** TEE showing multiple spontaneous air bubbles inside the left atrium.

Then, he was sent emergently for thoracotomy where the presence of a left atrial-esophageal fistula was confirmed. He underwent emergent repair of the esophagus and posterior wall of the left atrium. In a one week follow up visit, the patient had remarkable improvement of his mental status. However, he had persistent left hemiparesis.

### Discussion:

Atrial fibrillation is one of the most common clinically significant arrhythmias worldwide. Pharmacologic therapy is the cornerstone of atrial fibrillation treatment. Catheter ablation is commonly used for patients with anti-arrhythmic resistant atrial fibrillation.<sup>1</sup> Left atrial-esophageal fistula is communication between the left atrium and the esophageal lumen due to thermal injury during catheter ablation.<sup>3</sup> The clinical presentation at the beginning is quite subtle and variable.<sup>1,3</sup> Patients have been reported to be present with a variety of features, including chest pain, fever, dysphagia, odynophagia, and hematemesis. Chest pain is the most common symptom at initial presentation, consistent with our patient's symptomatology.<sup>3</sup> Neurologic symptoms are extensive with multiple ischemic infarcts due to septic or air emboli obstructing brain vasculature.<sup>1, 2</sup> Atrial-esophageal fistula can cause transmission of microorganisms and air from the upper gastrointestinal tract causing mediastinitis, endocarditis, air, or septic emboli.<sup>1,3,4</sup> Coronary air emboli can cause presentation with myocardial infarction. Major other complications are septic shock and massive gastrointestinal bleeding.<sup>2,3,4</sup> An atrial-esophageal fistula must be highly suspected in a patient with a history of left atrial ablation who presents with fever, neurological symptoms, chest discomfort or sepsis.<sup>1</sup>

This devastating complication can easily be misdiagnosed as infective endocarditis, which can lead to the performance of transesophageal echocardiography (TEE). However, if left atrial-esophageal fistula is suspected, esophageal manipulation with esophagogastroduodenoscopy (EGD), TEE, and nasogastric tube placement is absolutely contraindicated.<sup>3,4</sup> These procedures can insufflate air through fistula resulting in air embolization or increasing the fistula size.<sup>3</sup> In this case, EGD was done due to hematemesis before the diagnosis of atrial-esophageal fistula. Chest MRI or CT with intravenous contrast is the preferred diagnostic test demonstrating extraluminal air, pneumomediastinum, presence of intravenous contrast in the esophagus.<sup>1,4</sup> Brain MRI should also be done to diagnose cerebral emboli if patient presents with neurologic symptoms.<sup>1,3</sup>

The prognosis strongly depends on the patient's clinical status during the diagnosis, time interval between the onset of symptoms and definitive surgical management. The mainstay management is urgent cardiothoracic surgical repair.<sup>1,3,4</sup> Recent evidence suggests that surgical intervention leads to better

patient survival compared to endoscopic intervention. Of note, both procedures have high operative and mortality risks. Prompt diagnosis and management of this life-threatening condition is paramount to prevent catastrophic complications.<sup>3</sup>

**Conclusion:**

Atrial-esophageal fistula is invariably deadly without prompt treatment. Clinicians' awareness of this rare but highly fatal complication is imperative as delay in diagnosis and definitive management can cause devastating neurological injury or death. Multidisciplinary approach and early cardiothoracic surgical intervention are pivotal for better patient outcomes.

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**Conflicts of interest:** None

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