



Case report

A case of atrio-esophageal fistula masquerading as upper GI bleed

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ABSTRACT

We represent a fatal case of atrio esophageal fistula that presented as upper GI bleed. The case was complicated by rapidly progressing multi organ dysfunction syndrome and eventual death. This was an iatrogenic complication of an elective procedure.

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1. Case presentation

A 58-year-old Caucasian male with history of atrial fibrillation (Afib) on aspirin & rivoraxaban presented with chest pain and hematemesis to community hospital emergency room. He was intubated for air way protection. He went into rapid atrial fibrillation followed by hypotension and PEA. (Pulseless electrical activity) After successful resuscitation, the patient was transferred to our tertiary care center for definitive care for presumed GI bleed management. Upon arrival, the patient was encephalopathic with intact cough, corneal and pupillary reflexes. Initial treatment focused on the hematemesis, secondary anemia, cardiac arrest and fever. Within the first several hours there was an interval development of dysconjugate gaze and pupillary asymmetry. Unenhanced CT Head revealed pneumocephalus and a left cerebellar hemorrhage (Fig. 1). His constellation of symptoms had no good explanation for his shock syndrome. He was started on broad spectrum antibiotics. His electrophysiologist called to update that the patient was treated with radio frequency ablation (RFA) 17 days prior for atrial fibrillation. He felt intra esophageal thermal temperature was elevated. The diagnosis of Atria esophageal fistula (AEF) was highly suspected. A CT angiogram of the chest revealed a 5 mm posterior left atrial diverticulum consistent with AEF (Fig. 2). The patient underwent surgical repair but never regained consciousness following multiple embolic strokes. The patient's family decided to withdraw the care based on patients advance directives.

2. Discussion

AEF is a rare complication that occurs after a treatment with RFA for A fib. RFA is performed via circumferential ablation of atrial tissue surrounding the ostium of Pulmonary Veins (PV) with 60–85 W using an 8 mm distal tip catheter to create a lesion. RF ablation targets pulmonary vein ostium to isolate trigger from Left atrium (LA). Historically, AEF was described as intraoperative complication of cardiac surgery. The first case outside operating room settings was reported in 2004.

Cappato et al. surveyed 32,000 patients who underwent RFA. They observed procedure related complication rate of 0.11–0.30%. Some of the common complications reported were cardiac tamponade, AEF, stroke, embolization, myocardial infarction, pneumonia, and septicemia. There were total of 32 deaths reported. 15% of death were attributed to AEF (2nd most common cause after cardiac tamponade) which occurred between post procedure day 10–16 [1]. The presentation with AEF included cerebral air embolism, massive GI bleed, and septic shock [2].

The most common site for AEF is the posterior wall of LA where overlapping zone for inferior pulmonary vein ostium resides. The esophagus is usually in close proximity of this overlapping zone, which makes it vulnerable to thermal changes used for RFA. Schmidt et al. reported esophageal wall changes in 47% of their patients using a maximum power setting of 50 W [3]. Cummings et al., showed that lesions near the course of the esophagus that generated microbubbles during RFA had significantly increased esophageal temperature compared with lesions that did not, which supports the thermal changes playing a role in development of AEF fistula [4]. Studies in animal models suggest that damage to connective tissue and muscle layers of the esophagus can lead to inflammatory reaction and subsequent fistula formation even when

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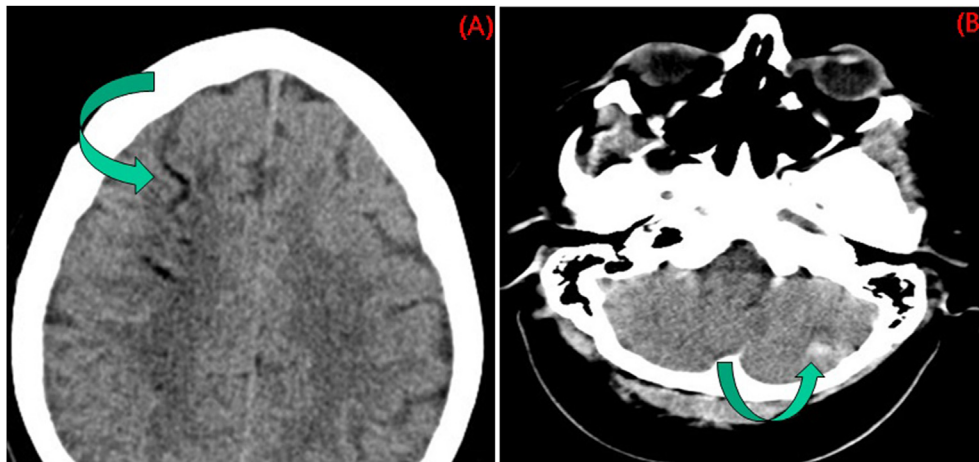


Fig. 1. Head CT without contrast. Part (A) Arrow head point towards right sided pneumocephalus. Part (B) Arrow head pointing towards left sided cerebellar hemorrhage.

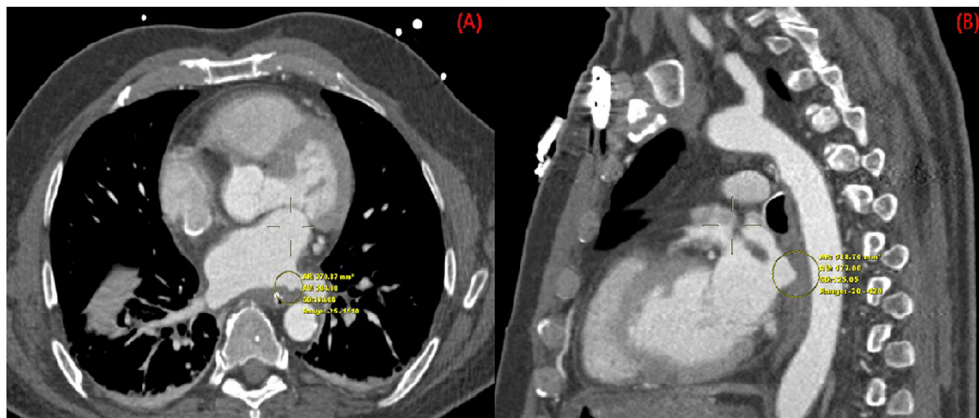


Fig. 2. CT angiogram of chest. 5 mm out pouching (cricked) arising from the left posterior lateral left atrium. This may represent a pseudoaneurysm from recent ablation or congenital diverticula in Part (A) (transverse) and part (B) sagittal view.

temperature changes were minimal [5]. This explains delayed occurrence of fistula up to 15–20 days post procedure [5].

General Anesthesia (GA) has been described as one of the risk factors for developing AEF. Loss of swallow reflex during GA leads to prolong thermal exposure of same area in the esophagus [6,7]. Higher temperatures and slow return to normal was noted in GA group [6]. Focal or circumferential ablation of PV involving esophageal temperature probe or NG tube may help identify position and reduce thermal injury [8].

AE fistula present 15–20 days after the procedure, therefore careful clinical history is very important. They can present with profound septic or hemorrhagic shock. Air embolism is also often times present. Diagnostic test include cardiac MRI, TTE, CT Chest with PO water soluble contrast to identify pneumodiastinum, and fistula [9] Trans esophageal echo cardiogram (TEE), esophagoscopy (EGD) should be avoided for diagnostic work up. These patients need to be managed in ICU settings, and surgical intervention is often needed to reverse the state of shock. Broad spectrum antibiotics, including coverage of gram negative enteric organisms should be used, but will not be suffice alone without surgical intervention.

Preventive measure includes a) Avoidance of general anesthesia B) Use of esophageal temperature probe to monitor esophageal temperature changes C) Use of esophageal probe or nasogastric tube to identify the location of esophagus in relation to posterior

wall of esophagus D) More ablation to roof instead of left posterior wall as overlapping line in posterior wall of LA might be the region where fistula can happen D) Use of low voltage thermal energy around 50 W when possible.

Conflict of interest statement

The author(s) Parth Rali, Mayur Rali and Khalid Malik declare(s) that there is no conflict of interest regarding the publication of this article.

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