

Case Report

Atrial-Esophageal Fistula with Embolic Stroke: A Rare Presentation Following a Redo Catheter Ablation for Atrial Fibrillation

Salman Arif*, Anupama Barua¹, Azar Hussain², Pankaj Kaul¹, Rodolfo Paniagua¹, Kalyana Javangula¹.

1 - Leeds Teaching Hospitals NHS Trust.

2- University of Hull.

***Corresponding Author: Mr Salman Arif**, SPr Cardiothoracic Surgery, Leeds Teaching Hospitals NHS Trust.

Received Date: April 13, 2021

Publication Date: May 01, 2021

Keywords: Atrial-Esophageal Fistula, Catheter Ablation, Atrial Fibrillation, Stroke.

Introduction

Atrial fibrillation (AF) is the most common type of quivering heartbeat (arrhythmia) that could lead to stroke, heart failure, and blood clots due to interruption of normal blood flow. It is estimated that more than 2% of the general population suffer from AF. It not only adversely affects the quality of patient's life but also has a huge financial burden. (1)

Catheter ablation of atrial fibrillation is an important therapeutic modality to treat drug-refractory AF. As it is a safe and less invasive method of ablation, the number of procedures being performed is on the rise with a success rate.² However, it is not without risk of complications. The overall rate of complications is 2.9% which includes vascular complications, cardiac tamponade, pericardial effusion, stroke/transient ischemic attack, significant pulmonary vein stenosis, phrenic nerve injury and left atrial to esophageal fistula formation listed in decreasing order of frequency. (3)

Left atrial to esophageal fistula is a rare complication occurring in 0.2% to 0.4% of AF ablation procedures (4) with a mortality rate of up to 80%, depending on the severity of presentation. The onset is usually insidious and mostly occurs several days or weeks after the procedure thereby delaying the

diagnosis and timely management. (2)

Case Report

We are reporting a case of 46 years old gentleman who underwent redo catheter ablation for paroxysmal atrial fibrillation. (3) weeks post ablation he was presented with symptoms of left-sided pleuritic chest pain with no fever. Laboratory investigations revealed normal WCC but raised CRP and D-Dimer and COVID swab was negative at that stage. On further investigations, CTPA confirmed a 7cm solid lesion in the left upper lobe of the lung with extensive lung parenchymal changes. He was treated for community-acquired pneumonia with clarithromycin and was referred to lung MDT.

He was re-presented one week later with fever (high WCC and CRP, Troponin >24000), left-sided weakness and low GCS ~8/15 that necessitates intubation. CT head did not show anything of significance but CT chest revealed gas posterior to the left atrial wall.

Splenic artery embolization was performed for splenic artery pseudoaneurysm to avoid the risk of rupture. The echocardiogram revealed a mobile material in the left atrium with mild LV systolic dysfunction. No abnormality was detected on the valves. A cardiac gated CT scan showed a gas locule within the left atrium (**Fig 1**) next to a subtle irregularity and the collapsed esophagus was seen running directly posterior to the abnormality.

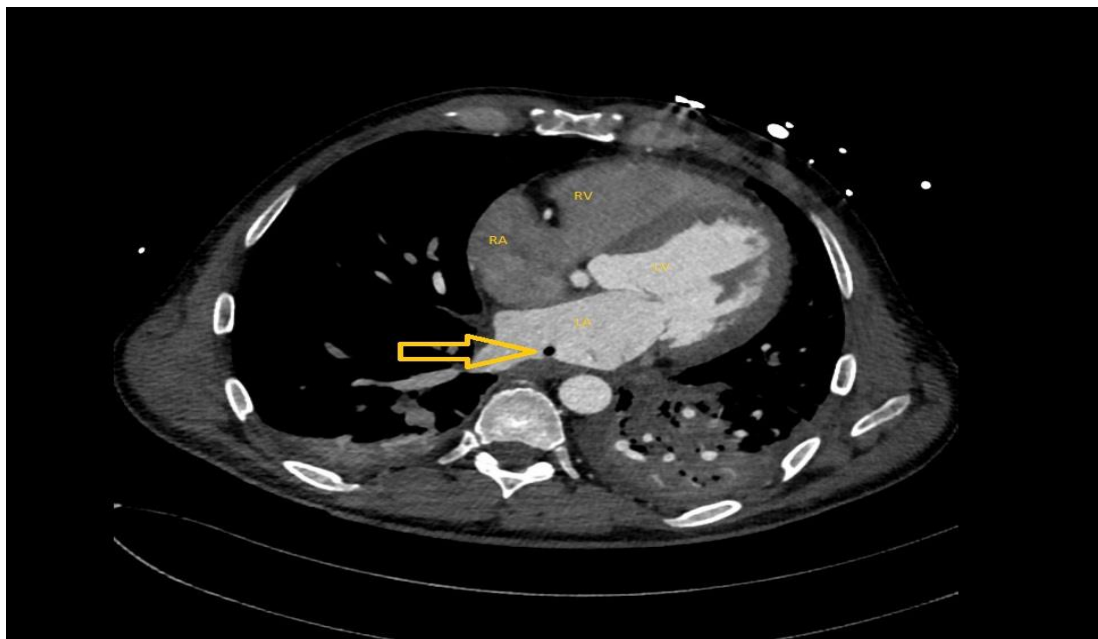


Figure 1: CT scan image of Left atrium. Arrow pointing at gas locule in the left atrium. LV = Left Ventricle, LA = Left Atrium, RV = Right Ventricle, RA = Right Atrium



At this stage differential diagnosis of the atrio-esophageal fistula was being considered and after multidisciplinary team discussion, the decision was made to proceed for the emergent repair of fistula followed by possible intervention on the esophagus given the patient's young age and poor prognosis without emergency surgery. The lung cancer prognosis was an unknown entity at that stage and the oncologist's input was considered later after the repair.

Median sternotomy was performed, and standard cardiopulmonary bypass was established. The left atrium opened and a small cauliflower-like growth (food debris) was seen on the posterior atrial wall close to the right inferior pulmonary vein. The debris was carefully removed, and the fistulous opening was closed with the help of a pledgeted suture. The left atrium was closed and the patient was weaned off from CPB easily. He had a brief period of AF which was self-reverted and the patient was shifted to the ICU. Post-operative CT head (due to multiple failed sedation holds) showed acute ischemic changes, predominantly within the right watershed territories and smaller left-sided infarcts involving thalamus, cerebellar and frontal regions, suggestive of the embolic phenomenon. The patient was extubated on post-op Day 4 and the care was stepped down to the ward on post-op Day 5. Post-operative CT scan showed successful closure of the atrial fistula and the patient was transferred to the care of respiratory medicine for further management.

Discussion

The number of catheter ablation procedures is increasing worldwide (5) due to the advancement in technology and increasing incidence of atrial fibrillation. Atrio-esophageal fistula is a catastrophic complication of AF ablation which is mostly presented with the classic triad of symptoms: fever, cerebrovascular insult and chest discomfort/pain. The anatomical proximity of the esophagus and left atrium (10-15mm) is the principal factor for the injury. The usual presentation is delayed for up to 2 months. Systemic embolization causes signs or symptoms related to different organs and systems. Our patient presented with fever and chest pain on first seeking medical advice at 3 weeks post-procedure and later had left-side weakness and altered state of consciousness. One should have a high index of suspicion in any patient who has a recent ablation procedure to avoid delay in the diagnosis and drastic complications.

The diagnostic modalities employed are transthoracic echocardiogram and CT scan, but they can miss the findings on early presentation. In about 7% of the cases, the initial CT scan fails to diagnose and the diagnosis is established on a repeat CT scan at a later date. (6) Thoracic or cardiac gated CT scan picks up pneumomediastinum or intracardiac gas locule. (7) Endoscopy of the esophagus is contraindicated in suspected cases of left atrial to esophageal fistula as it can cause air embolism resulting in stroke and/or death. In our case, the initial CT scan did not reveal any air but the



echocardiogram is done on the second presentation and a cardiac gated CT scan confirmed the diagnosis. This highlights the importance of repeat radiological investigation at intervals. Surgical closure of the fistula is the cornerstone of the management without which the prognosis is poor.⁶ Unfortunately, our patient has got dual pathology at presentation. We took the young age and poor prognosis on conservative management of fistula into account and proceeded to surgical intervention despite the radiological suspicion of lung malignancy. The lessons learned by this unusual case are that early recognition of the problem plays a crucial role in reducing mortality and morbidity. Surgical repair is the keystone in the management of atrial-oesophageal fistula without which the mortality is estimated to be around 80%. Following successful closure of the fistula, most of the esophageal defects close spontaneously. There are very few reports of the need for covered esophageal stents for patent defects. (8). The patient in our report had more than one ablation and whether that increased the risk of the fistula is an unknown entity. The timely intervention did help the patient to survive the dreaded complication and stopped further embolic insult. He made a good neurological recovery and was on his way to lung tumor management.

References

1. Kirchhof P, Benussi S, Kotecha D, et al. 2016 “ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS”. *Eur Heart J*. 2016 Oct 7;37(38):2893-2962.
2. Kim, Y.G., Shim, J., Lee, KN. et al. “Management of Atrio-esophageal Fistula Induced by Radiofrequency Catheter Ablation in Atrial Fibrillation Patients: a Case Series. *Sci Rep* 10, 8202 (2020)”. <https://doi.org/10.1038/s41598-020-65185-9>.
3. Gupta A, Parera T, Ganesan A, et al. “Complications of Catheter Ablation of Atrial Fibrillation A Systematic Review”. *Circulation: Arrhythmia and Electrophysiology*. 2013;6:1082–1088
4. Schuring CA, Mountjoy LJ, Priaulx AB, et al. “Atrio-Esophageal Fistula: A Case Series and Literature Review”. *Am J Case Rep*. 2017;18:847-854. Published 2017 Aug 1. doi:10.12659/ajcr.903966.
5. Kneeland PP, Fang MC. “Trends in catheter ablation for atrial fibrillation in the United States”. *J Hosp Med*. 2009;4(7):E1–5.
6. Han H, Ha F, Sanders P, et al. “Atrioesophageal fistula - Clinical Presentation, Procedural Characteristics, Diagnostic Investigations, and Treatment Outcomes. *Circulation: Arrhythmia and Electrophysiology*”. Volume 10, Issue 11, November 2017



7.Pappone C, Vicedomini G, Santinelli V. “Atrio-Esophageal Fistula After AF Ablation: Pathophysiology, Prevention & Treatment”. J Atr Fibrillation. 2013;6(3):860. Published 2013 Oct 31. doi:10.4022/jafib.860

8.Al-Alao B, Pickens A, Lattouf O, “Atrio-Oesophageal fistula: dismal outcome of a rare complication with no common solution”. Interactive cardiovascular and Thoracic Surgery, Volume 23, Issue 6, December 2016, 949 - 956.

Volume 2 Issue 5 May 2021

©All rights reserved by Mr Salman Arif