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Bi-atrial thrombus causing embolic stroke and pulmonary embolisms

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Cardioembolic Stroke Caused By Bi-atrial Thrombus And Treated With Intracardiac Thrombectomy; a Case Report

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Background

- Right atrium thrombus is labeled as thrombi in transit.
- It either progresses to the pulmonary arteries causing significant pulmonary embolism, or it straddles through patent foramen ovale (POF) leading to impending paradoxical embolism causing paradoxical strokes(1).
- This condition has been reported with high morbidity rate as the bi-atrial thrombus with concomitant paradoxical embolic stroke and PE causing hemodynamic instability(2).
- Systematic anticoagulation is the standard treatment for intracardiac thrombus. In cases of hemodynamic instability with massive PE, systematic thrombolysis and mechanical embolectomy can be used for rapid removal of the thrombus(3).
- We are presenting a rare case of right atrial thrombus straddling through PFO and causing embolic ischemic stroke and multiple PEs that was treated with endovascular embolectomy and closure of the PFO.

Case Presentation

- A seventy-nine-year-old male with history of coronary artery disease s/p CABG surgery who presented with acute onset altered mental status and left side weakness. CT angiogram of the head showed occlusion of the distal (P2) right posterior cerebral artery PCA. Brain MRI confirmed the acute right occipital lobar infarct.
- Transthoracic (TTE) and transesophageal echo (TEE) showed a right atrium serpentine thrombus measuring 5.5 x 0.7 cm and extending across PFO to the left atrium and relapsing through the mitral valve. CT PE showed pulmonary emboli in the proximal left lower pulmonary artery and in multiple segmental and sub-segmental branches.
- Given the size and burden of the thrombus and the risk of further embolization, patient was started on IV anticoagulation with Heparin.
- Due to the concern for anterograde propagation of the right atrial thrombus into the pulmonary artery, decision as made to pursue emergent percutaneous aspiration embolectomy followed by endovascular closure of the PFO. Embolic protection devices were deployed in the carotid arteries to prevent distal embolization.
- The patient recovered very well after the procedure and was stable to be discharged 3 days later. Repeat head CT showed no new embolic strokes.

Imaging

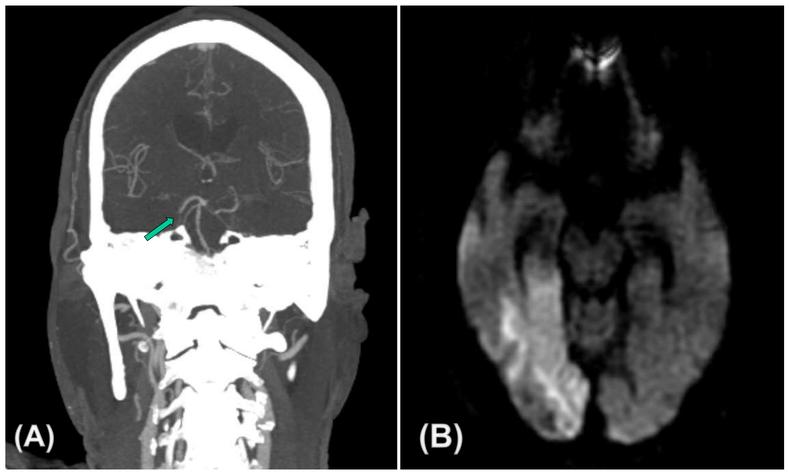

Figure 1. Brain Imaging showing acute stroke. (A): CT Angiography of the head (coronal view) is showing an abrupt cut of the right posterior cerebral artery PCA at the P1-P2 segments junction (green arrow). (B): MRI brain shows diffusion restriction on DWI in the right occipital and mesial temporal lobes in the right PCA territory.

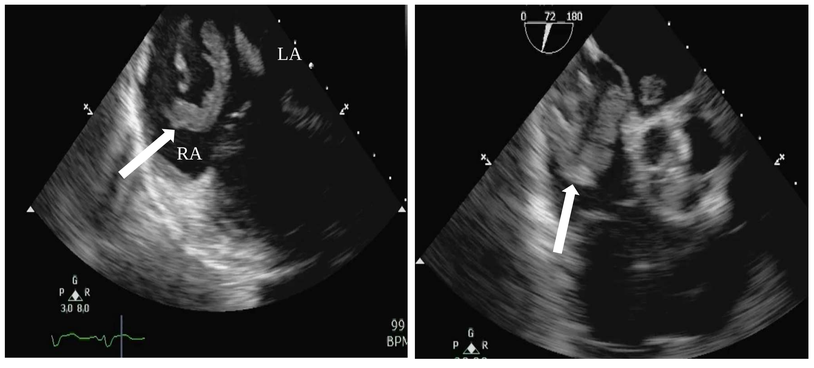

Figure 2. Transesophageal echocardiogram view of the interatrial septum. White arrow in both images is pointing a echogenic structure (thrombus) in the right atrium RA straddling through the patent foramen ovale PFO in the left atrium LA. Similar echogenic structure seen in the mitral valve.

Conclusion

- Bi-atrial thrombus is considered a fatal condition. It causes both systematic and pulmonary embolization.
- Elevated right to left atrial pressure gradient increases the risk for systematic embolization.
- Time-sensitive diagnosis and treatment of bi-atrial intra-cardiac thrombus is critical for good outcome. However, treatment option is not yet standardized.
- Systematic anticoagulation alone can be insufficient to rapidly dissolve the thrombus in unstable patient. Also, it carries an increased risk of hemorrhagic conversion in large ischemic stroke.
- Multiple clinical trials have prove the superiority of PFO closure compared to anticoagulation and antiplatelets therapy in paradoxical stroke prevention (4).
- All these factors make the acute intervention with embolectomy followed by PFO closure a more favored treatment in high risk patients.
- This is a case of multi-systemic embolization of the bi-atrial thrombus showing excellent outcome with immediate intervention with concurrent anticoagulation.
- A larger scale studies, with randomized clinical trial, if possible, is required to compare acute thrombectomy versus conservative medical management as a treatment for bi-atrial thrombus.

References

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