

## ATRIAL SEPTAL ANEURYSM WITH ACUTE HEART FAILURE IN (HFREF) AND SEVERE MR; A DIFFICULT CASE TO TREAT: CASE REPORT

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### INTRODUCTION

Atrial septal aneurysm (ASA) is a congenital cardiac anomaly that is characterized by saccular formation of the interatrial septum. Redundant atrial septal tissue results in bulging of the septum into either or both atria during the cardiac cycle. About 70% of patients can also have an associated PFO, placing them at increased risk of cryptogenic stroke.<sup>[1]</sup>

Diagnostic criteria for ASA established by Hanley based on the appearance on echocardiography are: aneurysmal dilatation of the atrial septum protruding at least 1.5 cm beyond the plane of the atrial septum or phasic excursion of the interatrial septum during the cardiac cycle of at least 1.5 cm in total amplitude with a diameter at the base of the aneurysm of at least 1.5 cm.<sup>[2]</sup>

### Case

A 57-year-old gentleman, known case of hypertension, dyslipidemia and severe mitral regurgitation with ejection fraction of 25% presented with exertional shortness of breath, orthopnea and paroxysmal nocturnal dyspnea for two days after stopping diuretics.

Medications at presentation: Furosemide (held for few days), Enalapril, Atorvastatin, Aspirin and Omeprazole.

Clinical examination revealed raised jugular venous pressure (JVP), blood pressure (BP) of 125/68, heart rate was 110 beat per minute, and edematous bilateral lower limbs (pitting). On auscultation he had a pan-systolic murmur at the apex -which was radiating to the axilla- and bilateral basal crepitation.

His ECG showed sinus rhythm, wide QRS, PVCs and left ventricular hypertrophy picture. Chest X-ray revealed cardiomegaly and bilateral lung congestion (Fig 1). Echocardiogram revealed a severely dilated left atrium, intra-atrial aneurysmal septum, no intra atrial shunt and severe mitral regurgitation with EF of 25% (Fig 2).

Patient was admitted to the hospital and commenced on IV Diuretics (Furosemide, 60 mg twice daily), Carvedilol

(3.125 mg twice daily) along rest of his own home medication. He improved clinically over 48 hours but he became oliguric, the renal function became impaired and he became hypotensive (BP 75/50). A follow up TTE showed full IVC with severe global hyperkinesia, severely dilated left and right atria. However, the right atrium cavity was obliterated by the septum (Fig 3).

ACE inhibitor and Beta blockers were held and Dobutamin infusion started. Over 5 days his urine output increased to 1.5 liter a day and renal function improved with BP 85/60 and heart rate sinus 90/min.

But weaning off the Dobutamin was difficult. We tried to give IV fluid boluses which did work but for a while, so we decreased the diuretic dose and commenced him on IV fluid where we were able to wean off the Dobutamin slowly over a week. Patient was discharged home with BP 90/60 on adjusted oral furosemide dose, digoxin, spironolactone, statin and Aspirin.

### DISCUSSION

Ejim et al, published that atrial septal aneurysm is representing 0.2% of the total adult population studied.<sup>[3]</sup> However, Ertan\_etal mentioned that in 16,570 patients were included in the study, 2.4% has atrial septal aneurysm.<sup>[4]</sup>

In a meta-analysis, the results showed that ASA alone or ASA with PFO is associated with ischemic and cryptogenic strokes in patients with age <55 years.<sup>[5]</sup> Furthermore, the ASA >5 mm in thickness has been found to have a higher association with stroke. The increased thickness may represent thrombotic material that has accumulated on the surface of the ASA.<sup>[6]</sup>

The ASAs are also associated with supraventricular tachyarrhythmia, mitral valve prolapses and migraines with aura.<sup>[7]</sup>

This patient had severe mitral regurgitation, HFrEf with EF 20-25% and a refractory heart failure which was difficult to treat. Diuretics are the corner stone in a treatment of acute heart failure however, in this case the over diuresis lead to cardiogenic shock due to the decrease in the right atrial filling and pressure which would pull the ASA toward the right atrial cavity (due to

difference between the intra atrial pressures) in the presence of severe mitral regurgitation, these will severely have decreased the right atrial cavity diameter and the atrial fillings. Furthermore, the decrease in the filling of the big left atrium will increase the regurgitate jet of the mitral regurgitation and will aggravate the hypotension. So the decrease of the venous return (intracardiac hypovolemia) and the pump failure will lead to a viscous cycle and difficulty to treatment.

We conclude that in such cases, ASA patients with heart failure and severe MR will has abnormal cardiac hemodynamics with small right atrial cavity and large left atrial cavity. The use of diuretics alone may worsen the cardiac hemodynamics. So the gentle use of IV fluid with inotropes cover may be the solution to break this viscous circle and overcome the difficulty in the treatment. Furthermore, in ASA patients with heart failure we recommend a cautious use of diuretics.



Fig. 1: Chest X ray.

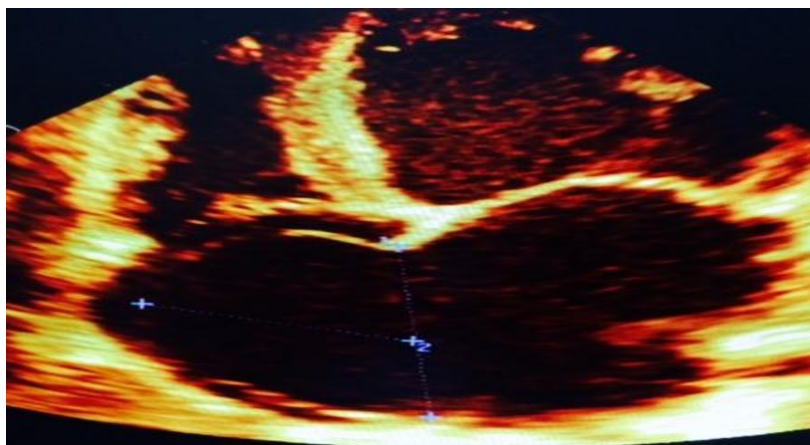
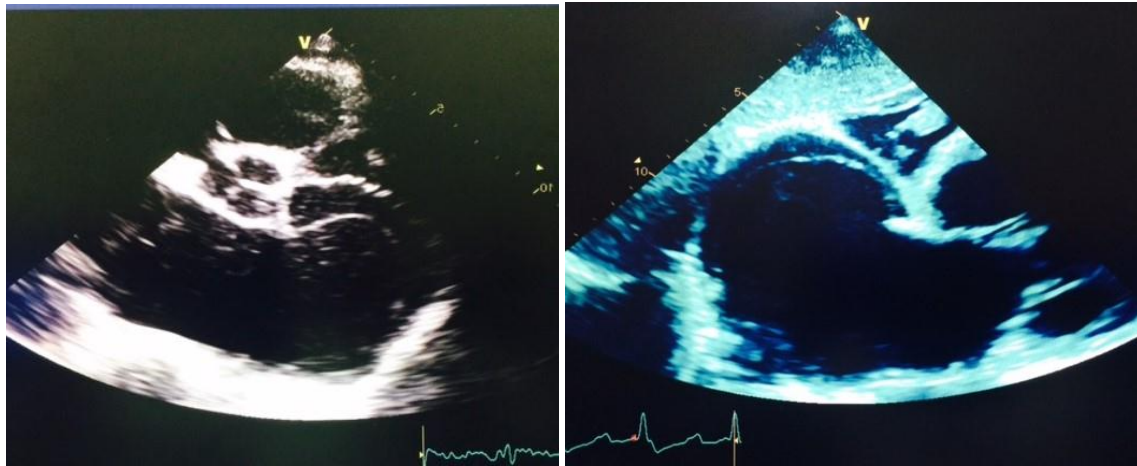


Fig. 2: TTE four chamber view showing severely dilated left atrium and intra-atrial aneurysmal septum.



**Fig. 3: TTE short Axis and Left para sternal views showing the right atrium cavity obliteration.**

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