CARDIAC RUPTURE AFTER ASD DEVICE CLOSURE

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HISTORY AND PHYSICAL

A 20 -year -old female presented to our clinic complaining of palpitation and dyspnea NYHA class I (The New York Heart Association Functional Classification). She did not mention any past history of medical conditions or drug use. Physical examination findings were unremarkable except for a wide and fixed splitting of S2 in cardiac auscultation.

Twelve lead ECG revealed sinus tachycardia with heart rate of about 105 beats/ minute, normal axis, incomplete right bundle branch block and T wave inversion in V2-V4 without arrhythmias.

Chest X-ray findings showed evidence of shunt vascularity and right ventricular enlargement.

IMAGING

Transthoracic (TTE) and later transesophageal echocardiography (TEE) showed a large 26mm secundumtype atrial septal defect (ASD) and a small PFO. Inter atrial septum(IAS) was reported to be redundant, however ASD rims seemed suitable for device closure expect for the anterosuperior rim that was absent. Antero-inferior rim was thin and redundant but 9mm in length. There was moderate to severe right ventricular (RV) enlargement and no valvular abnormality or concomitant congenital defect was found. Pulmonary arterial pressure was normal.

INDICATION FOR INTERVENTION

As the ASD had resulted in significant left to right shunting and RV enlargement,transcatheter device closure was planned.

INTERVENTION

Balloon-sizing was performed under TEE guide and achieved stop-flow at a size of 28mm.The patient underwent successful closure with a 30mm Occlutech® Figulla® Flex II ASD device. TEE confirmed the proper positioning of the device with a very small residue. TTE 24 hours later showed satisfactory results and the patient was discharged home with ASA and Clopidogrel. Three weeks later the patient came in for her scheduled clinic visit. She stated that she was asymptomatic and doing well and refused to undergo the recommended follow up TTE at the same day, but said she would come back for it in a few days. Six days later she was rushed to another hospital due to a sudden unset excruciating retrosternal chest pain, dyspnea and pre-syncope. Echocardiography at that center revealed evidence of cardiac tamponade. Due to impending hemodynamic collapse, about 100cc of bloody fluid was drained percutaneously .After relative stabilization the patient was transferred to our center. Echocardiography showed residual pericardial effusion with clots around aorta and RA but the device was in the correct position. (Figure1) Cardiac CT confirmed the proper device position on IAS with diffuse hemopericardium but site of leakage was not identified as the bleeding had stopped and perforation seemed to be sealed.

As device erosion of cardiac chambers was highly suspected, the patient was scheduled for cardiac surgery. During the surgery clots in the pericardial sac were observed .Close exploration of cardiac chambers revealed perforation in the antero-superior aspect the left atrial (LA) in close proximity to the aortic root. Aortic root was intact without evidence of erosion. LA perforation was repaired with a

surgical Pleget, the devise was excised and the ASD closed with a pericardial patch with good final results. (Figure2) Patient had an uneventful post-op recovery.

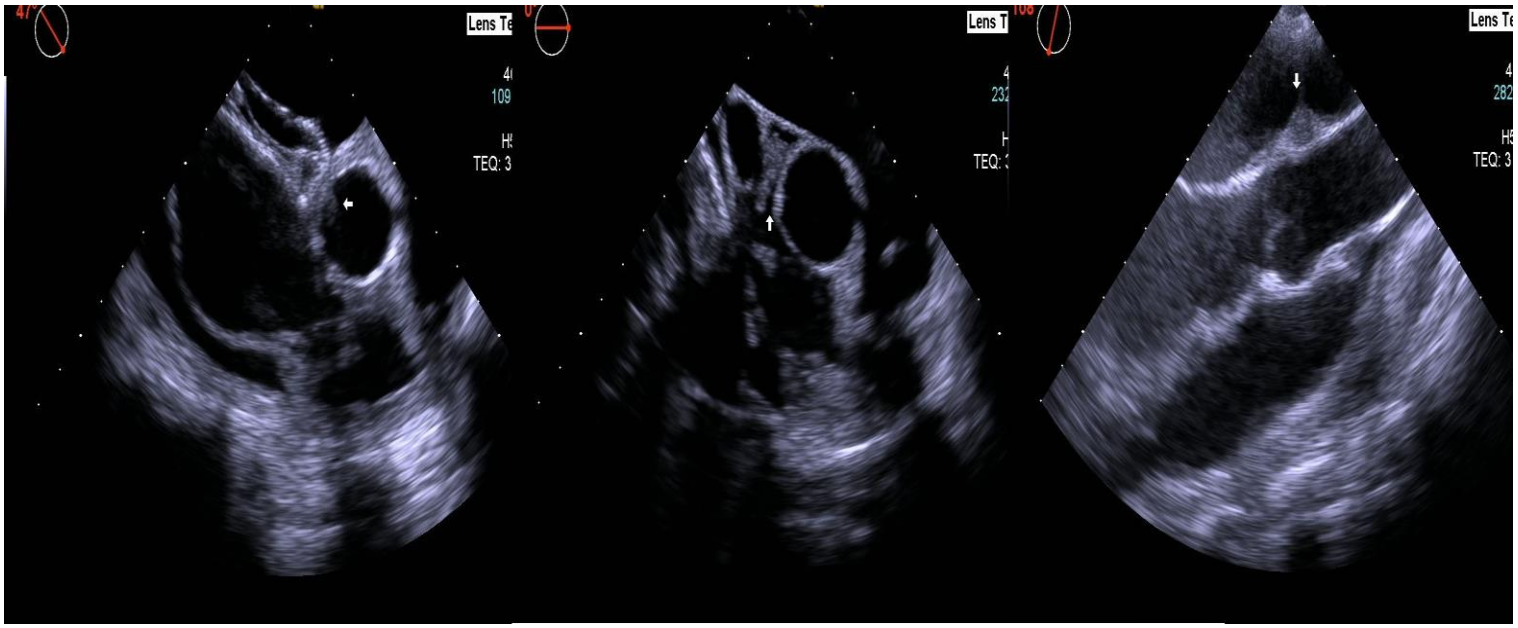

Figure1-Echocardiography views showing clot around aorta (arrows) and pericardial effusion.

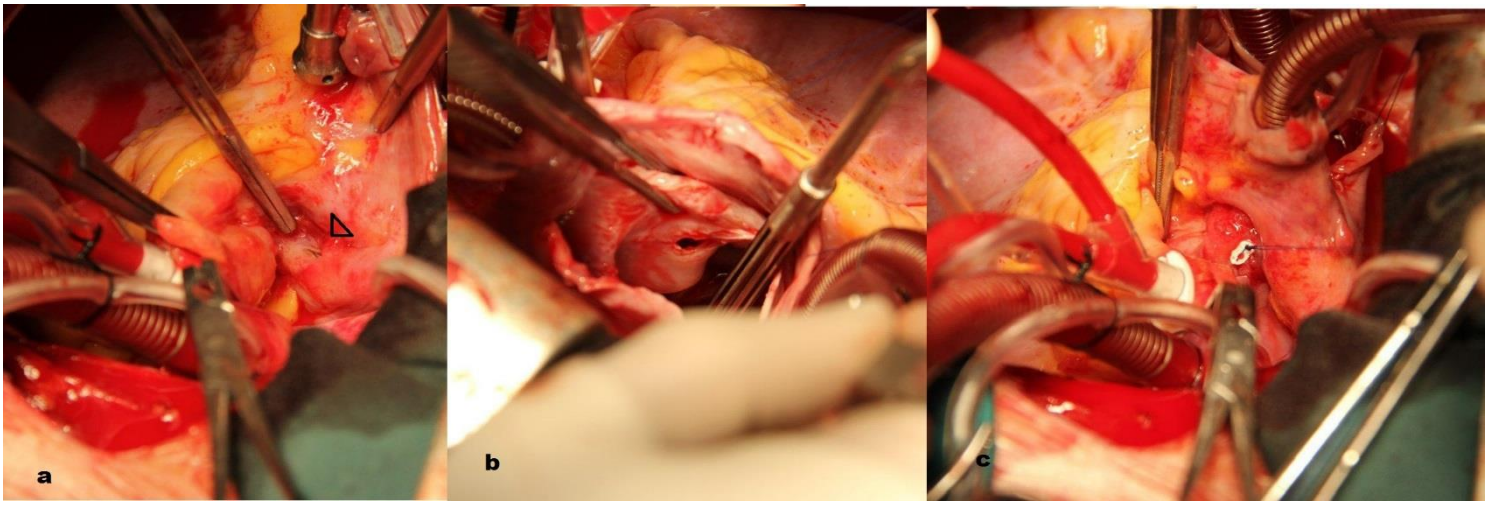

Figure2-a&b: Surgical views of device protrusion through left atrial wall and subsequent perforation, c: Surgical repair of perforation.

LEARNING POINTS OF THE PROCEDURE

Although percutaneous ASD closure is considered to be a generally safe and effective intervention, device erosion and cardiac perforation are rare but potentially fatal complications that could happen at any phase post-intervention. The routinely recommended clinical visits do not seem to be able to predict or prevent this complication. The risk factors are poorly understood but device erosion seems to be more common in cases that the aortic rims are deficient; device is over-sized or has exaggerated motions on IAS.