Resolution of aortic regurgitation due to Venturi effect after device closure of ruptured sinus of Valsalva aneurysm

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Introduction

Sinus of Valsalva aneurysms (SOVAs) are often associated with concomitant moderate or severe aortic regurgitation and such patients are referred for surgery as it is generally believed that hemodynamically significant aortic regurgitation is worsened by device closure.

Case scenario

Our patient was a young male with sudden onset breathlessness, on evaluation, found to have a ruptured sinus of Valsalva aneurysm arising from the right sinus. TEE demonstrated larger than 12 mm defect with the right coronary cusp being plastered deep into the mouth of the ruptured right sinus and severe free aortic regurgitation. By considering the worse hemodynamic status of the patient we decided to go ahead with device closure with an Amplatzer duct occluder. An arterio- venous loop was made after crossing from aortic side and a 12Fr, 45- degree Atrial septal defect closure sheath was advanced across the defect from the right atrium. This causes a decrease in aortic regurgitation which gave us confidence in proceeding with the device closure expecting a favorable outcome in aortic regurgitation. Once the device (22 x 20mm ADO 1) was placed, TEE demonstrated rather surprisingly complete and proper coaptation of all three aortic cusps causing the disappearance of aortic regurgitation.

Discussion

Hemodynamically significant aortic regurgitation has been traditionally considered to be a contraindication to devise closure in ruptured SOVA.

The current patient was thus an exception where all but disappeared after device closure possibly due to two reasons, one is that the advancement of a large sheath (12 F)across the SOVA led to a decrease the shunt and therefore the Venturi effect responsible for the prolapse of the right coronary cusp deep into the sinus and second was the physical displacement of cusp back into its place after a large- sized device was deployed.

Conclusion

This case report highlights hemodynamically significant aortic regurgitation in ruptured SOVA and those with entrapment of leaflets due to venturi effect may have complete resolution of aortic regurgitation after device placement.

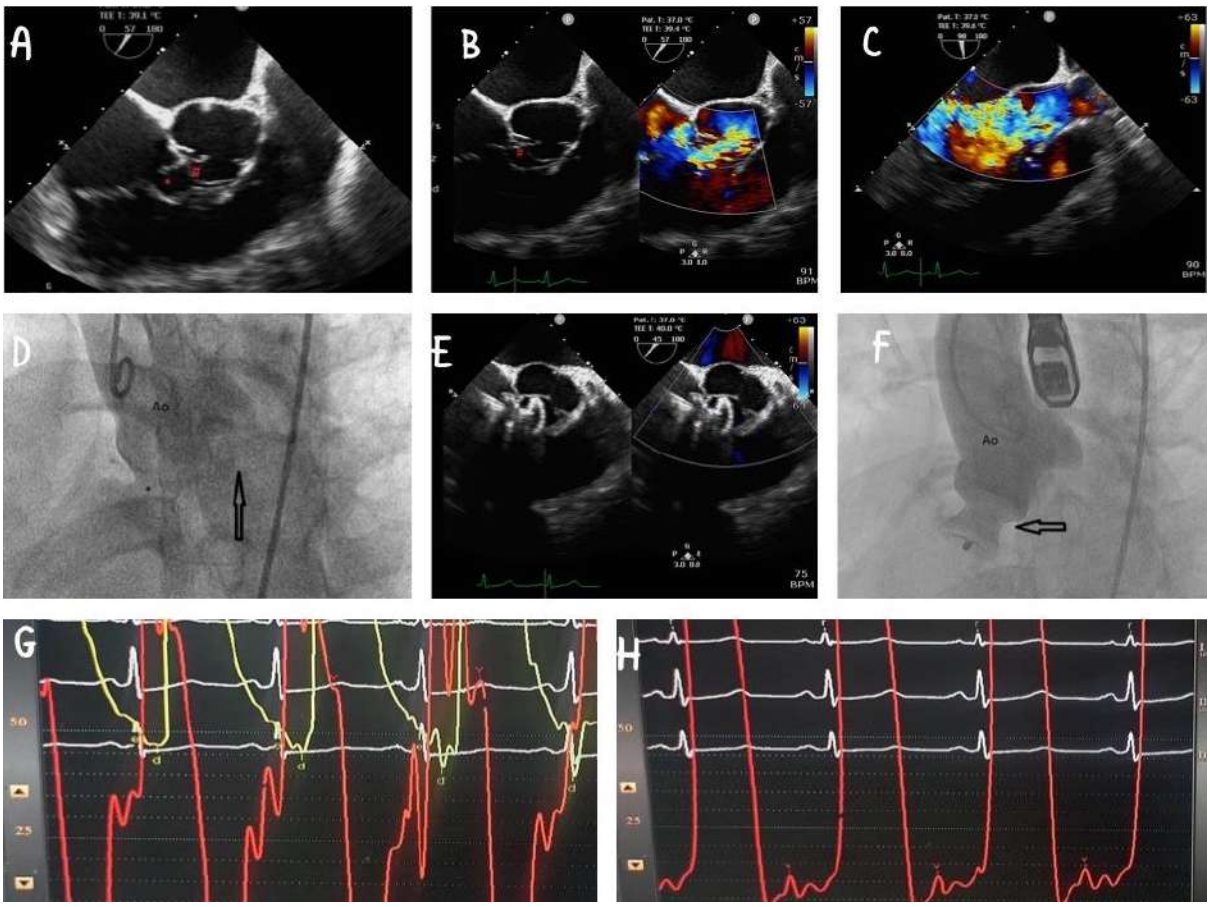


Figure 1: A) TEE demonstrating non-coronary cusp of the aortic valve (#) entrapped into the ruptured SOVA (*). B) TEE image of ruptured SOVA (#) with the left to right shunt. C) TEE showing severe aortic regurgitation. D) Aortogram in Left anterior oblique 70 and cranial 15 degrees demonstrating the ruptured sinus of Valsalva (*) with severe aortic regurgitation(arrow). E) TEE showing the device being placed into the aneurysmal tract. F) Aortogram in a similar orientation as E with the device in situ(arrow) demonstrating no residual intra-device or para-device leak and no jet of aortic regurgitation. G) Pre-procedure LVEDP (40mm Hg). H) Post procedure fall in LVEDP (15mmHg)

Recent Publications

1.Kumar D, Kesavan V, Lanjewar CP, Sabnis G. Resolution of aortic regurgitation due to Venturi effect after device closure of ruptured sinus of Valsalva aneurysm. Catheter Cardiovasc Interv. 2023;1-3.doi:10.1002/ccd.30746

2.Cardiac autonomic neuropathy in diabetes mellitus: Dr. Bijaya K Behera, Dr.Vishnu K: International Journal of Research in Medical Sciences | January 2018 | Vol 6 | Issue 1 Page88 .DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20175501

3.Superior vena cava syndrome: a case report of a rare form of presentation-Bijaya K. Behera*, Vishnu K., Jaison George, Susanta K. Nahak: Int J Res Med Sci. 2018 Jul;6(7):2547-2550. DOI:10.18203/2320-6012.ijrms20182516

4.Constrictive Pericarditis, a Difficult Diagnosis - A Case Report with Review of Literature: DrC R Khatua, Dr Sooraj Menon R, Dr Roniya Simethy, Dr Kumar Avijeet Dash, Dr Vishnu K: JMSCR Vol||3||Issue||11||Page 8447-8450||November,2015.

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