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Case Report

Radiology Section

Unruptured Noncoronary Sinus of Valsalva Aneurysm Associated with Atrial Septal Defect (ASD)

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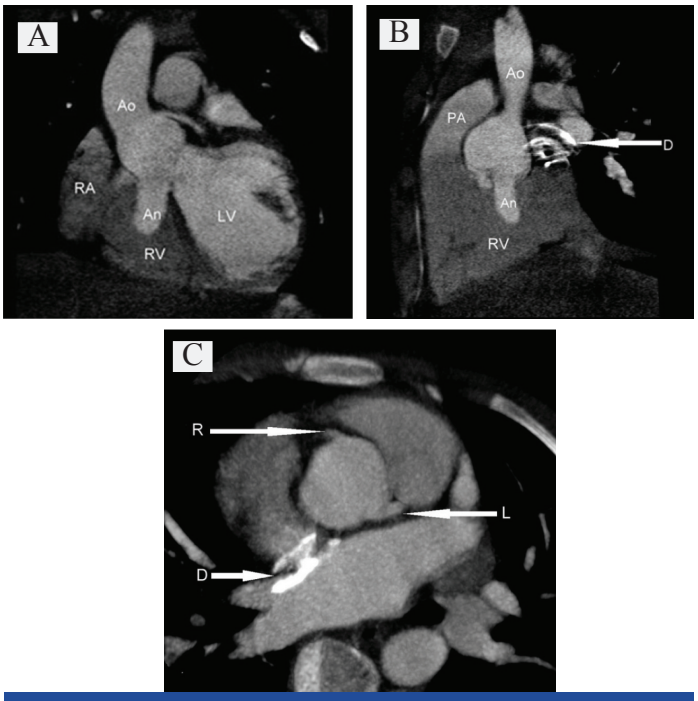
ABSTRACT

Sinus of Valsalva aneurysms are rare cardiac anomalies. Incidence of this anomaly is higher in Asian population with male preponderance. Our case highlights a rare association between unruptured sinus of Valsalva aneurysm and atrial septal defect (ASD). Rarely diagnosis of sinus of Valsalva aneurysm is missed on two dimensional echocardiography. Multi slice CT scan is done to confirm echocardiographic findings and to detect any missed complications, other cardiac abnormalities and anatomy for a precise surgical approach.

Keywords: Aortic regurgitation, Chest pain, Echocardiography

CASE REPORT

A 15-year-old male patient with past history of atrial septal defect (ASD) closure done at the age of five years, presented with chest pain. On examination pulse rate was 84/min, RR was 20/min, BP 120/70 mmHg with grade 2/3 pan systolic murmur. Plain Chest X-ray revealed surgical clips of ASD closure. Patient underwent 2D echocardiography during evaluation which revealed saccular dilatation of non coronary sinus superior to the aortic annulus with mildly dilated aortic root projecting into the right atrium measuring 4x4 cm in size without any signs of rupture. Right and left coronary sinuses were normal with normal right ventricle (RV)/Left ventricle (LV) function and associated aortic regurgitation. A diagnosis of unruptured non-coronary sinus of Valsalva aneurysm was made. For confirmation and pre-operative planning ECG gated contrast CT was done which revealed an out pouching from the non-coronary cusp with same contrast intensity as seen in aorta [Table/Fig-1a,b]. Metallic closure device of ASD was also seen on CT [Table/Fig-1b,c], hence the diagnosis of sinus of Valsalva aneurysm was confirmed. Despite of the giant sinus of Valsalva aneurysm requiring surgical intervention, patient refused surgery. Because surgical intervention was not possible medical management with beta blocker was advised with six monthly follow up by 2D Echo. After 3 follow-ups, neither did the aneurysm increase in size nor was the patient symptomatic.

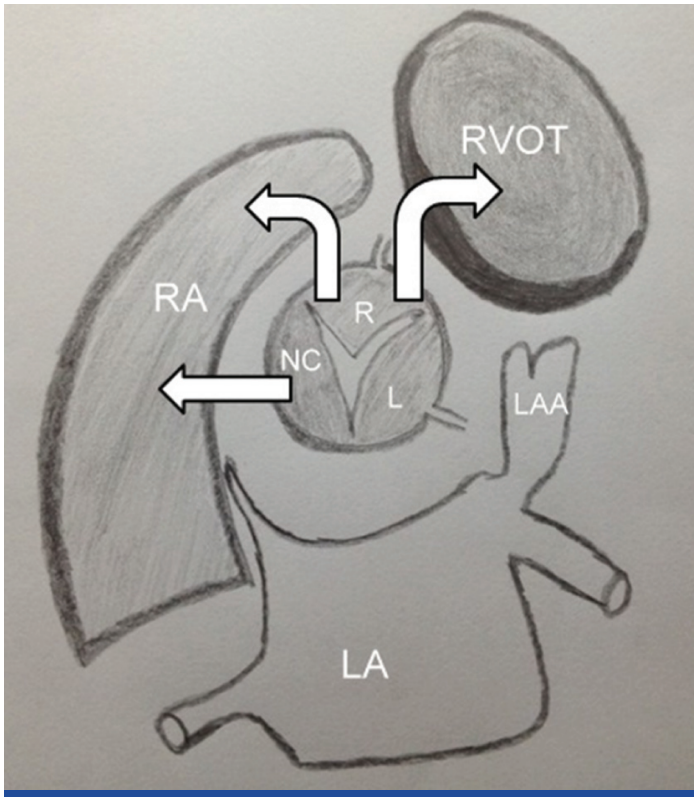


[Table/Fig-1]: (a&b) ECG gated contrast enhanced cardiac CT reformatted images in coronal (1a) and sagittal (1b) plane showing unruptured aneurysm (An) of size 2.7cm x 1.3 cm x1.2 cm (CC X TR X AP) arising from the non-coronary sinus of valsalva protruding into the right ventricle (RV). Metallic ASD closure device [D] seen in figure 1b. LV indicates left ventricle. RA indicates right atrium. Ao indicates aorta. PA indicates pulmonary artery. D indicates ASD closure device. (c) Normal origin of right coronary artery[R] and left main coronary artery [L] from respective normal coronary sinus seen. Metallic ASD closure device [D] seen

DISCUSSION

There are very few cases in clinical literature with unruptured sinus of Valsalva aneurysms. Most commonly these aneurysms are from right aortic sinus, sometimes from non coronary sinus and rarely from left coronary sinus [1]. These aneurysms are five times more common among Asians as compared to Caucasians [2]. They are more common in men as compared to women [2]. Both unruptured and ruptured sinus of valsalva aneurysms is associated with potentially life threatening complications. Presentation of an uncomplicated unruptured sinus of valsalva aneurysm is very rare. The clinical manifestations of sinus of valsalva aneurysms vary widely. Patient tends to present with aneurysm rupture or symptoms due to the mass effect [3].

Commonly the non ruptured aneurysms are discovered as an incidental finding from an echocardiography while evaluating murmurs or from abnormal cardiac contours on radiological imaging [3]. Aortic valve regurgitation is frequently associated with sinus of Valsalva aneurysms and can have a prevalence rate of up to 44% [4]. Bulkley et al., reported two patients in which aneurysms of the non-coronary sinus projected into the right atrium and caused tricuspid incompetence [5]. Multiple published cases were reported in which a nonruptured sinus of Valsalva aneurysm had partially obstructed the right ventricular outflow tract [6-9]. Also, cases were reported in which a non ruptured Valsalva sinus aneurysm had dissected into the interventricular septum [10,11] at the time of manifestation [12]. In our case, the patient presented with chest pain which can be angina secondary to myocardial ischemia and with a pan systolic murmur which can be secondary to a tricuspid regurgitation on account of the aneurysm extending into the right atrium [12]. However, they can rarely present with chest pain, continuous murmur or right ventricular outflow tract (RVOT) obstruction and tricuspid regurgitation. However, there were no such changes on echocardiography which means they were temporary findings. Aortic regurgitation in this patient is most likely related to the aortic



[Table/Fig-2]: Diagrammatic depiction of complication of right and non-coronary sinus in the form of rupture into right side causing left to right shunt. RVOT indicates right ventricular outflow tract. LA indicates left atrium and LAA indicates left atrial appendage. RA indicates right atrium

root dilation. While doing imaging studies, the criteria for diagnosing a Valsalva sinus aneurysm are an origin above the aortic annulus, a saccular shape, and normal dimensions of the adjacent aortic root and ascending aorta [12]. Small sized unruptured aneurysms as in the case of this patient can be kept under observation however surgery is offered in case of suspected complications [12]. Right and non-coronary sinus rupture into right side causing left to right shunt and can lead to heart failure [Table/Fig-2] SOVA is easily diagnosed on colour Doppler echocardiography. Nevertheless contrast CT or MR provide much better spatial resolution and anatomical details with 3D reformation which are invaluable in surgical planning. MR is advantageous in depicting left ventricular haemodynamics and aortic regurgitation but CT is less time consuming and preferred. Surgery is the preferred treatment in case of ruptured aneurysm. In unruptured sinus of Valsalva aneurysm, symptoms of cardiac dysfunction and progression are important determinants. However, there is controversy regarding surgical intervention in unruptured and asymptomatic patients [12].

CONCLUSION

Our case demonstrates unusual association between ASD and unruptured sinus of Valsalva aneurysm. Rarely diagnosis of sinus of Valsalva aneurysm is missed on 2D echocardiography which can easily diagnosed by Contrast enhanced ECG gated CT scans. Nonetheless CT is required for its complication, associated cardiac anomalies and gives anatomical details which help in surgical approach. Patient is doing well even after 18 months. Sinus of Valsalva aneurysm is a rare finding and is usually diagnosed on 2D echocardiography. Surgery is the treatment of choice.

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