



A CASE OF UNRUPTURED ANEURYSM OF SINUS OF VALSALVA CAUSING RVOT OBSTRUCTION

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Abstract :

Abstract An unruptured sinus of Valsalva aneurysm is rare and is usually asymptomatic until a symptom associated with its complication develops. Hence, an unruptured sinus of Valsalva aneurysm is not infrequently missed unless echocardiogram is performed with other indications.

Among the other presenting features, an unruptured sinus of Valsalva aneurysm rarely protrudes into the right ventricular outflow tract, causing the right ventricular outflow tract obstruction. In this report, we describe a rare case of unruptured sinus of Valsalva aneurysm producing the right ventricular outflow tract obstruction, which was incidentally detected by echocardiography.

Keyword : Sinus of Valsalva, Aneurysm, Right Ventricular outflow obstruction

Introduction:

Aneurysms of the sinuses of Valsalva (ASV) are thin-walled out pouchings, most commonly involving the right or the non-coronary sinuses first described by John Thurnam in 1840. They may be either congenital or acquired in origin.

A congenital SVA is usually clinically silent. Mild dilatations are asymptomatic and detected in routine 2-dimensional echocardiography. Symptoms can result either from compression of adjacent structures or intra cardiac shunting following rupture of the SVA into the right side of the heart¹. Approximately 25% of reported cases of sinus of Valsalva aneurysm (SVA) are clinically asymptomatic. There have been a few reported cases of unruptured sinus of Valsalva aneurysms, which have presented with conduction disturbances, myocardial ischemia, and symptomatic cardiac dysfunction². The right coronary sinus is adjacent to the pulmonary outflow tract immediately below the pulmonic valve. Aneurysms of the right sinus therefore protrude into the pulmonary outflow tract and almost always rupture into the right ventricle; in rare cases they may be high enough to rupture into the pulmonary trunk. A right sinus of Valsalva aneurysm projecting into the right ventricle below the pulmonic valve may cause pulmonary outflow tract obstruction. Unruptured sinus of Valsalva aneurysms simulating right sided valvular disease with tricuspid regurgitation or with features

of right heart failure have also been reported³. Here, we describe an asymptomatic patient who was diagnosed as having an unruptured sinus of Valsalva aneurysm with the right ventricular outflow tract obstruction (RVOT).

Case report A 47-year-old female presented with history of dyspnea NYHA class II. Her blood pressure was 130/70 mmHg and her pulse rate, 66 beats per minute. On physical examination, an ejection systolic murmur of grade III/VI was audible at the left second intercostal area. She was in sinus rhythm on electrocardiogram. There was no history of chest trauma, fever or exposure to sexually transmitted diseases. Complete hemogram and biochemical parameters were within normal limits. VDRL test was done and was negative. TPHA test was also done and was negative for anti treponemal antibodies. Chest X-ray showed mild cardiomegaly without any abnormal finding in the lung parenchyma. Transthoracic echocardiography (TTE) showed a sinus of Valsalva aneurysm involving the right coronary sinus, along with mild aortic regurgitation. The aortic valve was tricuspid and there was no associated ventricular septal defect. The ascending aorta was not dilated and the left ventricular systolic function was normal without any demonstrable regional wall motion abnormalities. Despite no evidence of intra cardiac abnormal shunt flow, abnormal systolic flow acceleration was noted at the RVOT adjacent to the right SVA, suggestive of the RVOT obstruction. For confirmation, trans esophageal echocardiography (TEE) was performed. A large right coronary SVA encroaching the RVOT and producing the RVOT obstruction with a peak gradient of 90 mm Hg was clearly identified. There was no shunt flow suggesting rupture of the sinus of Valsalva aneurysm. (fig 1,2,3) Cardiac catheterization study was performed which clearly demonstrated the sinus of Valsalva aneurysm protruding into RVOT causing narrowing of RVOT without any shunt. (fig 4,5,6)



FIGURE 1

Trans esophageal echo 120 deg long axis demonstrating the right sinus of Valsalva aneurysm and mild aortic regurgitation

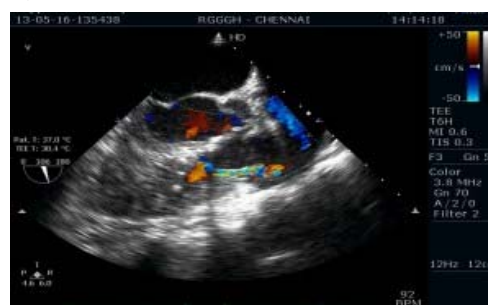


FIGURE 2

Trans esophageal echo in the same view showing systolic flow acceleration across right ventricular out flow tract

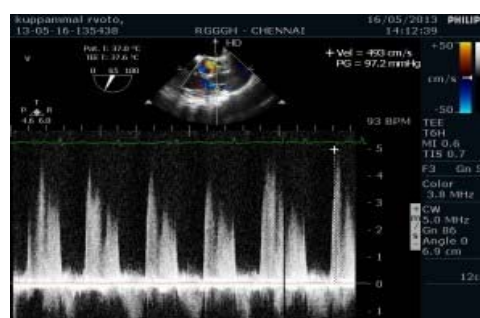


FIGURE 3

Trans esophageal echo view showing a gradient of 90 mm Hg right ventricular out flow tract

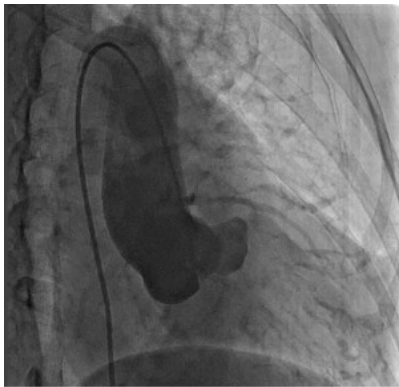


FIGURE 4

Aortic root angiogram RAO view demonstrating aneurysm of the sinus of Valsalva protruding



FIGURE 5

Right ventricular angiogram AP view demonstrating narrowing at the RVOT

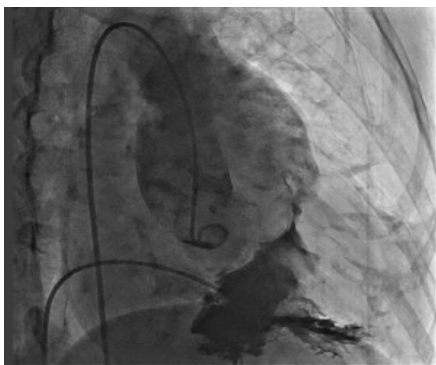


Figure6. Simultaneous RV and Aortic root angiogram in RAO view demonstrating aneurysm of the sinus of Valsalva protruding anteriorly into RVOT obstructing the outflow

Discussion:

Sinus of Valsalva aneurysms are not very common with a reported incidence of 0.14-0.23%⁴. Many SVAs are congenital in origin as is the likely cause in our patient. They may also be seen after bacterial endocarditis, atherosclerosis, tertiary syphilis or chest trauma⁵. SVAs can be associated with bicuspid aortic valve, aortic regurgitation and ventricular septal defect. Right sinus of Valsalva is involved in 65-85% of SVAs whereas non coronary in (10-30%). Involvement of left sinuses is very rare. Absence of normal elastic and muscular tissue leading to thinning of the wall of the aortic sinus is the postulated mechanism behind dilation finally resulting in SVA rupture. Rupture of the dilated sinus may lead to intra cardiac shunting when a communication is established with the right atrium [10%] or directly into the right ventricle (60-90%). Cardiac tamponade may occur if the rupture involves the pericardial space^{1, 7}. Unruptured SVA is rare and is usually asymptomatic, until a symptom of the accompanied complications develops. In this respect, an unruptured SVA is likely to be missed. Even more uncommonly, an unruptured SVA encroaches into the RVOT and can cause the RVOT obstruction with or without subjective symptoms. Our patient presented with severe degree of RVOT obstruction. Few cases of RVOT obstruction caused by aneurysm of right sinus of Valsalva have been reported in literature.

B H Bulkley et al³ in a series of 31 patients with un ruptured sinus of Valsalva aneurysms reported RVOT obstruction in 3 cases and tricuspid regurgitation in 2 cases. Aneurysm of right sinus of Valsalva with RVOT obstruction associated with VSD in a 14-year-old boy⁸. Few other cases of isolated unruptured sinus of Valsalva aneurysm producing right ventricular outflow obstruction have been reported^{9, 10}. An uncommon case of unruptured right SVA producing RVOT obstruction, complete heart block and protruding into left ventricular outflow tract has been reported¹¹. Initially, invasive angiography was considered the gold standard for diagnosing this disease, TTE and/or TEE emerged as preferred modalities of choice nowadays. In particular, TTE and/or TEE is a quick and noninvasive method that can provide additional information on the size and location of aneurismal dilatations, the presence of fistulous tract, the presence or absence of cardiac chamber involvement, the degree of aortic insufficiency, and identification of any associated anomaly or complication. Optimal management of an asymptomatic, unruptured SVA is not established, since no precise natural history is currently available. Unruptured SVAs, although remaining silent, may expand, cause more severe symptoms, and require more extensive corrective procedures in the future¹². Early surgical intervention is now preferred to prevent the development of more severe symptoms, and more extensive disease¹³. Our patient is on follow up with cardiothoracic surgical department.

Conclusion:

Cases of unruptured sinus of Valsalva aneurysm with right ventricular outflow tract obstruction are rare. TTE and TEE are invaluable tools in the diagnosis and in assessment of the associated hemodynamic alterations. Our patient presented with exertional dyspnea without signs of right heart failure.

Though optimal management has not been established, early diagnosis and earlier surgical intervention may help improve the prognosis.

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