



NON SURGICAL INTERVENTION OF RUPTURED SINUS OF VALSALVA – A CASE REPORT

Cardiology

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ABSTRACT

We report a case of a 33-yr-old male patient presented to us with dyspnoea of NYHA grade2 of 30 days duration, who was evaluated to have non coronary sinus of Valsalva aneurysm rupturing into right atrium. This is a very rare congenital cardiac anomaly with variable clinical presentation ranging from asymptomatic detection on imaging to acute coronary syndrome and sudden cardiac death. Rupture is the most dreaded complication and usually manifests as an acute event.

KEYWORDS

Ruptured Sinus of Valsalva (RSOV), Coronary sinus, Aneurysm, Device closure, surgical management.

INTRODUCTION:

Aneurysm of sinus of Valsalva is a rare anomaly accounting for less than 1% of congenital cardiac anomalies. RSOV arises from a congenital defect of the aortic media or due to damage caused by bacterial endocarditis

CASE REPORT:

A 33-yr-old male patient presented to us with dyspnoea of NYHA grade2 of 30 days duration. Physical examination revealed bilateral pedal oedema and raised jugular venous pressure. There was tachycardia with bounding pulse. Blood pressure was 130/50 mmHg in both upper limbs. Apex beat was palpable in the left 5th intercostal space 1 cm lateral to mid-clavicular line with grade II parasternal heave. A continuous thrill was palpable in the left 3rd intercostal space. Cardiac auscultation revealed a continuous murmur maximally heard over the left 2nd and 3rd intercostal spaces. A Continuous murmur was heard over the tricuspid area increasing on inspiration. A clinical diagnosis of PDA with tricuspid regurgitation (TR) was kept. However, differential diagnosis of ruptured sinus of Valsalva, coronary AV fistula, aortopulmonary window, and anomalous origin of left coronary artery from pulmonary trunk were also entertained. Routine investigations revealed Haemoglobin= 13.1 gm/dl, TLC = 5,900/cu mm, ESR = 10 mm at end of 1st hour. BU = 25 mg/dl, S. Creatinine = 1.1 mg/dl, urine examination was normal, chest X-ray demonstrated marked cardiomegaly. Transthoracic echo revealed ruptured sinus of Valsalva having fistulous tract with right ventricle with moderate TR with moderate left ventricular dysfunction. Colour Doppler revealed a continuous flow from ruptured Non coronary sinus into right ventricle. There was no evidence of vegetations. ECG revealed right atrial enlargement with left ventricular enlargement with a diastolic overload pattern. Fundus examination was normal

Patient was diagnosed to have RSOV to right atrium and was given options of device closure or surgery. As patient had some financial problem, patient asked for some time to make necessary arrangements and then got discharged. Patient was discharged with diuretics and beta blockers. After returning we planned for device closure. The procedure was performed under local anaesthesia, FLOUROSCOPY AND 2D Echo guidance a PDA device (COCOON DUCT OCCLUDER) of size 16/18 mm was chosen to close the defect (Fig 1 to 4). Patient tolerated the procedure very well and Check Angiogram and 2D Echo done showed no AR, TR or residual shunt. Patient was kept on aspirin 150 mg.



Figure 1: Ruptured sinus of Valsalva in to right atrium

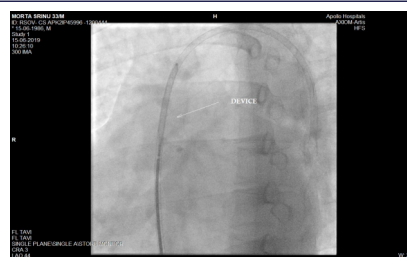


Figure 2: Device – Cocoon Duct occluder of size 16 mm x 18 mm



Figure 3: Device deployed across the defect

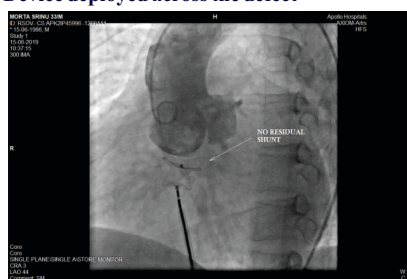


Figure 4: Check angiography showing no residual shunt and Device in place

DISCUSSION

Rupture of aneurysm of the sinus of Valsalva is an uncommon condition with a wide spectrum of presentation, ranging from an asymptomatic murmur to cardiogenic shock or even sudden cardiac death.[1] Although the first report of RSOV was in 1839,[2] it was not until 1957 that Lillehei[3] reported the first successful surgical repair. Surgical correction has since become the treatment of choice. However, lately isolated RSOVs have been successfully closed percutaneous using transcatheter devices.[4]

Causes of sinus of Valsalva aneurysm are classified into congenital or acquired. Congenital type occurs where a lack of fusion exists between the aortic media and the annulus fibrosis of the aortic valve.[5] Acquired sinus of Valsalva aneurysms can exist in patients with endocarditis,[6] syphilis,[7] injury, Behcet's disease, and Marfan's

syndrome. Deficiency of the aortic media at the attachments on the aortic annulus portion may progressively lead to dilation of aortic sinus, usually over many years. Therefore, sinus of Valsalva aneurysm can remain subclinical for several years until it eventually ruptures between the third and fourth decades of life.

The most common sites of aneurysm ruptures are cardiac chambers, interventricular septum,[8] or pericardial space. Dilated sinus of Valsalva aneurysm also can lead to distortion of aortic valve and AR. Un-RSOV aneurysms usually do not cause any symptom and are often found during echocardiogram examination and cardiac catheterization. However, un-RSOV aneurysm may cause right ventricular outflow tract obstruction [9] and myocardial ischemia due to the mass compression effect of aneurysms. The RSOV aneurysms most often involve with the right coronary sinus (76.8%–83.3%) or with other non coronary sinus, while an aneurysm of the left sinus is rare.[6] Most right sinus of Valsalva aneurysms rupture into the RV (86.7%),[6] or into the RA. Patients may remain asymptomatic for several years even if the sinus of Valsalva aneurysms has ruptured. However, dyspnoea and exercise intolerance may develop because of the increased shunting and volume overloading.

The traditional treatment involves surgical repair with a patch closure at both ends under cardiopulmonary bypass. Percutaneous device closure of RSOV is an alternative with the merits of smaller trauma since Cullen reported the first case of transcatheter closure of RSOV.[10]

TTE and TEE have played an important role in the diagnostic confirmation of Valsalva aneurysm sinus.[5] Doppler findings may identify the exact shunt location. The “windsock” dilatation of sinus of Valsalva aneurysm is the feature of sinus of Valsalva aneurysm. Doppler features include a continuous high-velocity flow from the aorta to the heart chamber. The diagnosis usually is confirmed by colour Doppler flow mapping. The colour Doppler flow mapping may reveal a continuous mosaic flow jet from an aneurysm to the heart chamber. Continuous rotation of a multiplane TEE may be particularly helpful to identify the exact point of rupture.

Aneurysm of sinus of Valsalva in this case appears to be congenital in nature manifesting at this age of 33 years. Embryological basis of this defect is congenital failure of fusion of aortic media with fibrous skeleton of heart through which a sinus of Valsalva aneurysm may develop. This defect typically begins as a blind diverticulum that takes origin from a localised site on one of the coronary sinuses. Substantial majority of ruptures develop after puberty but before 30 years of age. Aneurysm of right coronary sinus is most frequent and ruptures into right ventricular outflow tract. Non-coronary sinus ruptures into the right atrium and left coronary sinus into the pericardial space beneath left coronary artery. Aneurysm of right coronary sinus may produce undermining of aortic valve and may cause incompetence of valve as is present in this case. Some cases may have associated ventricular septal defect. Heart blocks and conduction abnormalities may occur due to protrusion of aneurysm into the interventricular septum [11]. While in most cases illness is known to proceed quickly to decompensated failure, there are few reports of prolonged survival [12]. These lesions may be complicated by infective endocarditis and can be recognised early with transthoracic echocardiography and transoesophageal echocardiography. This defect can be tackled successfully by timely surgical intervention [13].

CONCLUSION:

The prevalence of RSOV is less than 1%. Most SVAs arise from the right coronary sinus, and they most often rupture into the right atrium or ventricle. In young and middle-aged patients with symptoms of acute heart failure and new heart murmurs, RSOV should be considered in the differential diagnosis. Transthoracic and or transoesophageal echocardiography is the better diagnostic method. Surgical repair is the usual treatment of choice for RSOV, and percutaneous catheter-based closure is a less invasive alternative. RSOV requires early diagnosis and treatment.

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