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(CASE REPORT)

An incidental finding of a giant 73 mm aneurysm of the sinus of Valsalva: Case report

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Abstract

Aneurysms of the sinus of Valsalva (SVA) are rare cardiovascular abnormalities with potential life-threatening complications. We report a case of an asymptomatic patient in whom routine cardiac imaging revealed a giant aneurysm of the sinus of Valsalva measuring 73mm in maximal diameter. Transthoracic echocardiography and computed tomography confirmed the diagnosis and allowed precise anatomical evaluation. Despite the absence of symptoms, the extreme size raised concerns for future complications which emphasise therapeutic considerations especially surgical management.

Keywords: Incidental; Giant; Aneurysm; Sinus of Valsalva; Asymptomatic

1. Introduction

Aneurysmal dilatation of one or more of the sinuses of Valsalva is a rare cardiac anomaly that can be congenital or acquired and remain silent until rupture occurs which complicates early detection and clinical diagnosis .If left untreated, ruptured SVAs can lead to atrial and ventricular dilatation, pulmonary hypertension, and ultimately right-sided heart failure.[1]Surgical intervention is typically reserved for aneurysms that are hemodynamically significant, symptomatic, rapidly enlarging, or causing mechanical distortion of adjacent structures .[2]

2. Case presentation

We report the case of 75-year-old male patient with cardiovascular risk factors including age, sex, and hypertension, His hypertension was poorly controlled despite a dual therapy regimen consisting of a calcium channel blocker (CCB) and an angiotensin-converting enzyme inhibitor(ACE i).He was asymptomatic and reported no limitations during daily activities ,no chest pain no dyspnea , however during routine annual cardiac follow-up , physical examination showed high blood pressure 140/85 mmHg with regular heart rate and no precordial murmur ,he had no clinical signs of heart failure .EKG showed sinus rhythm at 75 beats /min with narrow QRS complexes and no repolarisation abnormalities ,an isolated premature ventricular contraction was noted. (figure 1)

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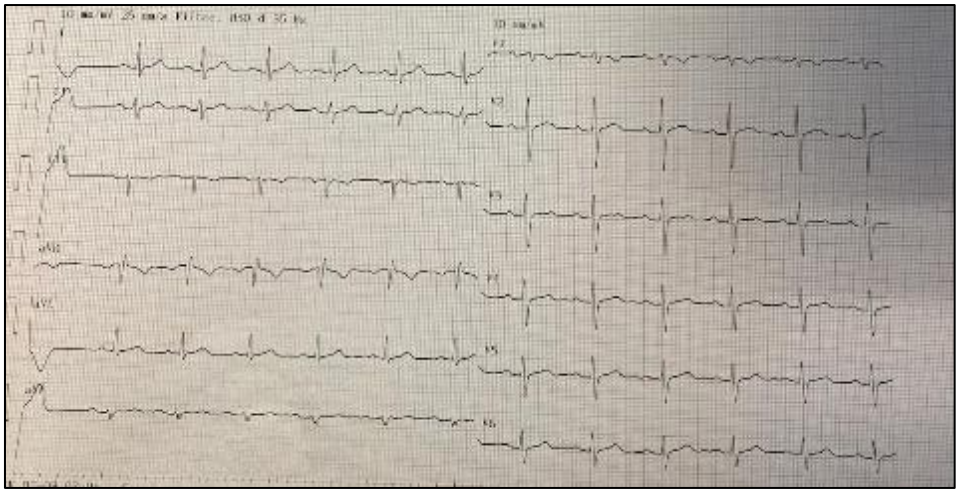

Figure 1 EKG showing sinus rhythm 75 eats /min - narrow QRS complexes- normal repolarisation -isolated premature ventricular contraction

Routine Transthoracic echocardiography revealed tricuspid aortic valve with massive dilatation of the sinus of Valsalva, measuring 71 mm, sino-tubular junction and ascending aorta were non dilated measuring respectively 33 mm and 39 mm , with mild aortic regurgitation (grade 1) no color evidence of fistula, no sign of coarctation of the aorta. (Figure 2)

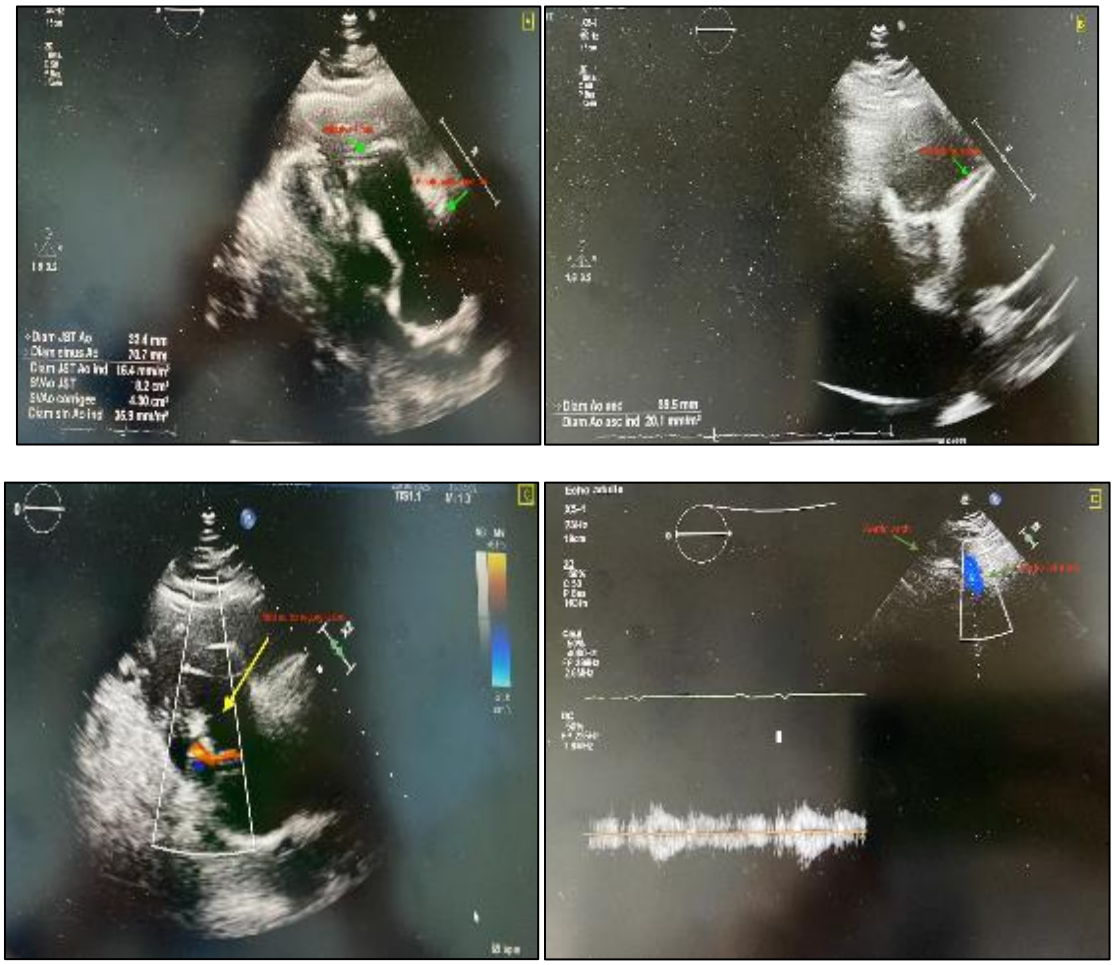

Figure 2 Transthoracic echocardiography A: parasternal long axis view showing dilatation of Valsalva sinus at 70 mm -sino-tubular junction at 34 mm B : parasternal long axis view showing normal sized ascending aorta C: Color doppler in the parasternal long axis view showing mild aortic regurgitation (grade 1) D: suprasternale view illustrating normal size aortic arch with no sign of coarctation on continuous wave doppler

Left ventricular assessment revealed left ventricular hypertrophy with normal regional wall motion and preserved ejection fraction of 69 %in (BPM) .To further assess the anatomy and exclude complications, coronary computed tomography confirmed the diagnosis of aneurysm of 3 sinus predominant on the non coronary sinus measuring **73 *61*47 mm** (figure 3)non dilated ascending aorta measured at 38*38mm with no signs of rupture, thrombus or fistula ,no significant aortic valve regurgitation. The assessment of severity of calcified lesions in the left anterior descending artery and the right coronary artery was limited by suboptimal contrast enhancement due to inadequate contrast injection.

Figure 3 Coronary CT angiography (CCTA) aneurysm of 3 sinus predominant on the non-coronary sinus measuring 73 *61*47 mm in the axial view - non dilated ascending aorta measured at 38*38mm (sagittal incidence)

Coronary angiography, performed as part of the preoperative evaluation, revealed significant stenosis of the left anterior descending (LAD) artery. (figure 4)

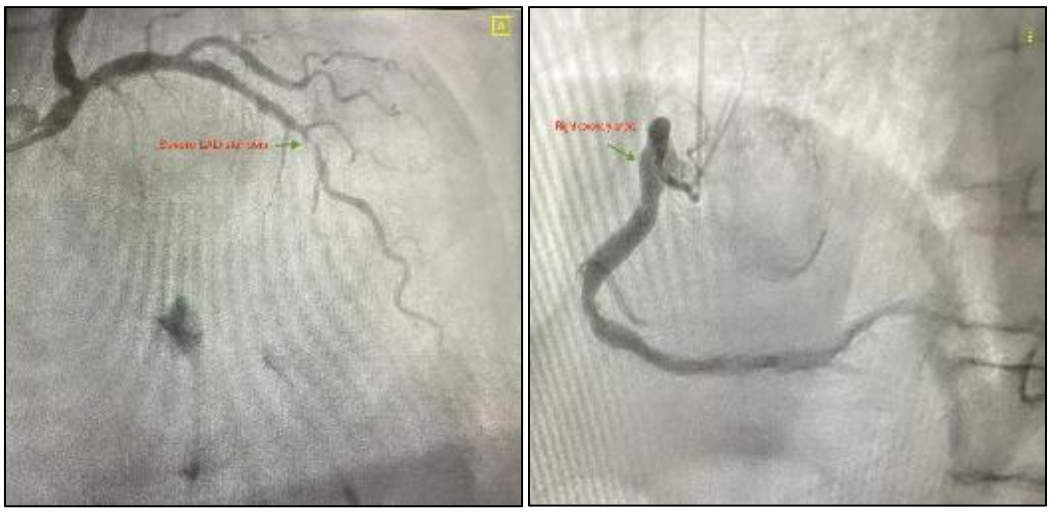

Figure 4 Coronary angiography A: Left anterior caudal incidence showing severe stenosis of mild left anterior descending artery (LAD) B : right anterior oblique cranial incidence (RAO) showing right coronary artery with no significant stenosis

The patient underwent emergent surgical therapy including combined valve sparing aortic root replacement with single coronary artery bypass grafting on the left anterior descending artery.

3. Discussion

Aneurysm of Valsalva sinus is anormal dilatation of one or more of the sinuses that form the connexion between the aortic and the sinotubular junction ,it is a rare cardiac anomaly that can be congenital or acquired ,originating predominantly from the right coronary sinus, in approximately 94% of the case [3]

Autopsy studies indicate that SVAs occur in less than 0.1% of the general population [4] ,it can be congenital accounting for only 0.1% to 3.5% of congenital heart diseases with predilection for males and are associated with a bicuspid aortic valve [5]

Acquired SVAs tend to present in older adults, reflecting the cumulative effects of risk factors like atherosclerosis and past infections [6] such as tuberculosis and infective endocarditis, they can also have iatrogenic origin, with injury received during trauma, aortic valve replacement, or ventricular septal defect closure. [7,8]

Normal range size of Valsalva sinus indexed for body surface area is 1.7 ± 0.2 cm/m^2 and 1.8 ± 0.2 cm/m^2 for women and men, respectively.[9]

Early detection and diagnosis of SVA can prove to be challenging [5] generally in small and unruptured SVA witch are asymptomatic and are only incidentally found.[10,11]

Unruptured SVAs may cause unusual structural and functional anomalies presenting with atypical clinical manifestations, such as right ventricular outflow tract obstruction ,conduction disturbances ,myocardial ischemia or syncope . [12]

Patients often exhibit symptoms of right-sided volume overload and may present with a continuous murmur on auscultation [5] , our patient despite a maximal diameter of 73 mm, clinical examination was normal witch likely accounts for the lack of clinical symptoms .

For screening modality echocardiography remain the is the first choice because of it 's high sensitivity and availability than completed by gated computed tomography or magnetic resonance imaging to provide complementary anatomic depiction and valuable functional information ,also to identify complications such as rupture or fistula. [12]

In case of complicated aneurysms ,such as small fistula or in high surgical risk patients transcatheter closure can be proposed carrying potential risks such as device migration ,residual shunting or interference with adjacent structure [5]

The maximal diameter of 73 mm places our patient at an exceptionally high risk of imminent rupture or severe mechanical complications ,so based on the European Society of Cardiology (ESC) guidelines for the management of peripheric arterial and aortic diseases, surgical intervention was indicated , [13] with conservative valve-sparing aortic root replacement combined with a single coronary artery bypass graft (CABG) which were performed successfully to our patient .

Abbreviations

- SVAs: sinus of Valsalva aneurysm
- CCB: calcium channel blocker
- ACEi: angiotensin converting enzyme inhibitor
- CABG: coronary artery bypass graft
- CCTA: coronary computed tomography angiography
- LAD: left anterior descending artery
- BPM: Biplane Simpson method

4. Conclusion

This case highlights that giant sinus of Valsalva aneurysms can remain clinically silent despite extreme size, emphasizing the crucial role of clinical examination multimodality imaging in detection, anatomical assessment, and risk stratification and timely surgical management witch all assist in ensuring excellent long term outcomes.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that there is no conflict of interest

Statement of ethical approval

Ethical approval was not required for this case report in accordance with institutional and national guidelines

Statement of informed consent

Consent was obtained from the patient for publication of this case report and accompanying images.

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