

Two-Dimensional Echocardiographic Diagnosis of Unruptured Sinus Of Valsalva Aneurysms (Report of two cases)

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İKİ BOYUTLU EKOKARDİYOĞRAFİ İLE
YIRTILMAMIŞ SİNÜS VALSALVA
ANEVRİZMALARININ TANISI:
İki Olgu

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SUMMARY

Two rare cases of unruptured sinus of Valsalva aneurysms were diagnosed by two-dimensional echocardiography before their successful operations. In Case 1, the aneurysm originated from the noncoronary sinus and associated with a bicuspid aortic valve. It protruded into the right atrium. The aneurysm was resected and the bicuspid aortic valve was replaced with an Omniscience prosthetic valve. In Case 2, the aneurysm originated from the right sinus of Valsalva compressing the right atrium and ventricle. Its diameter was 14x17 cm. which was the largest aneurysm ever reported. It was also resected completely. In view of these two cases, the role and the value of echocardiography in the diagnosis of sinus of Valsalva aneurysms are discussed.

Key words: Echocardiography, heart defects, congenital, iinu* of Valsalva aneurysm

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ÖZET

İki boyutlu ekokardiyografi ile, çok nadir görülen iki sinüs Valsalva anevrizması vakasının teşhisi ameliyat öncesi yapıldı ve ameliyatla da doğrulandı. Birinci vakada, anevrizma nonkoroner sinüsten kaynaklanıyordu ve biküspit aorta ile beraberdi. Sağ atriumu doldurmuştu. Bu anevrizma tümüyle alındı ve aort kapağı Omniscience tipi bir prostetik kapakla değiştirildi. İkinci vakada, anevrizma sağ koroner sinüsten kaynaklanıyordu ve sağ atrium ile ventriküle baskı yapıyordu. Çapı 14x17 cm. olup, bize göre literatürde rapor edilen vakaların en büyüğü idi. Bu da tümüyle rezeke edildi. Bu iki vakanın görülmesi sebebiyle, iki boyutlu ekokardiyografinin değeri ve önemi tartışıldı.

Anahtar kelimeler: Ekokardiyografi, konjenital kalp defektleri, Valsalva sinüsü anevrizması

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Aneurysms and fistulas of the sinus of Valsalva are rare. They represent only 3.5 percent of all those with congenital cardiac disease surgically treated (1). Unruptured aneurysms of the sinus of Valsalva and sinus of Valsalva aneurysms associated with a bicuspid aortic valve are extremely rare (1, 2). In their classifications Sakakibara and Konno (2) and Taguchi and et al. (1) did not mention any case of sinus of Valsalva aneurysms originated in the noncoronary sinus associated with bicuspid aortic valve. Below we present such two rare cases diagnosed by two-dimensional echocardiography (2 DE) and operated on successfully.

CASE REPORTS

Case 1.

M.T., a 19-year-old girl, was admitted to the Car-

diology Department with exertional palpitations for 2 years and chest pain for 5 months. She also had 3 syncopal attacks within the last year and complained of dizziness for the last 6 months. There was no history of notable past illnesses.

On physical examination her blood pressure was 100/70 mmHg and pulse 84/min and regular. The apex beat was in the fifth intercostal space and prominent. A systolic thrill was palpated at the aortic area and a grade 4/6 harsh systolic murmur was heard at the same area radiating to the neck. The second heart sound was normal.

Laboratory data showed no abnormalities. The electrocardiogram was normal. The chest X-ray showed a prominent ascending aorta and rounded left heart border. The echocardiographic study, which

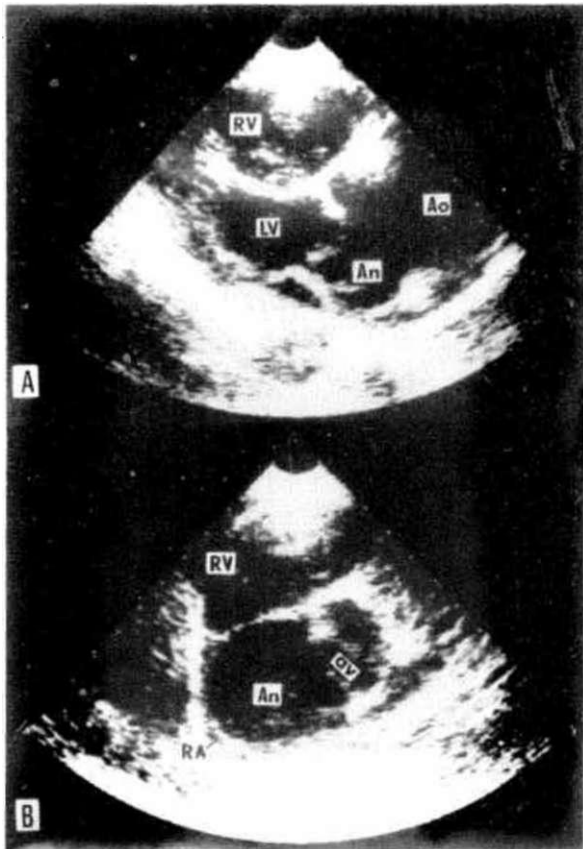


Figure-1. (A) Two-dimensional echocardiogram in the parasternal long-axis view showing aneurysmatic non-coronary sinus (An) and the dilated aorta. Left atrium is pushed by the aneurysm. (B) The parasternal short-axis view at the level of aortic valve showing the bicuspid aortic valve (av) and the aneurysmatic non-coronary sinus which protrudes into the right atrium completely. An: non-coronary sinus of Valsalva aneurysm; Ao: Aorta; av: aortic valve orifice; LV: left ventricle; RA: right atrium; RV: right ventricle.

was done by a Hewlett-Packard system, revealed a bicuspid aortic valve, dilated aorta, a very large non-coronary sinus of Valsalva aneurysm protruding into the right atrium completely and a very fine diastolic fluttering on the anterior mitral leaflet (Fig.-1). On cardiac catheterization, non-coronary sinus of Valsalva, 5 cm in diameter, and dilated aorta were seen (Fig.-2), a grade 1(+) aortic regurgitation was present. Because of her symptoms surgery was performed with the aid of cardiopulmonary bypass and cold chemical cardioplegia. After doing aortotomy the thickened bicuspid aortic valve and a large (3x5 cm) unruptured sinus of Valsalva were seen. There was no ventricular septal defect. Both coronary arteries originated in the non-aneurysmatic (anterior) sinus. The aneurysm was

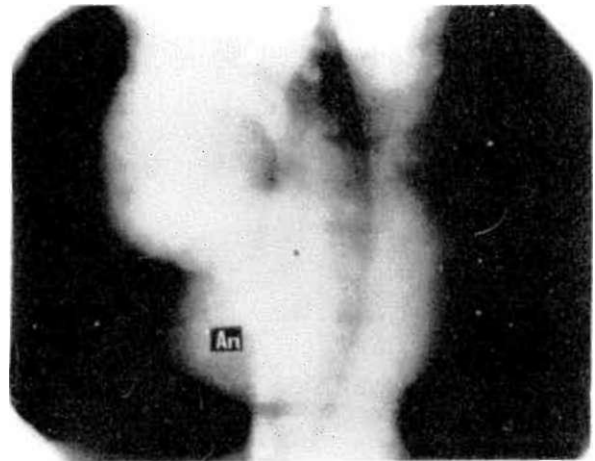


Figure-2. Aortogram (left anterior oblique view). The aneurysm fills from the non-coronary sinus and the dilated aorta is visualized. An: aneurysm

resected, aortic valve was replaced by a number 23 Omniscience prosthetic valve. Both the ascending aorta and arcus aorta were dilated (7 cm in diameter) and ready to rupture. It was decided to resect some part of the ascending aorta and decrease the diameter by 30 percent. Then it was closed with primary sutures. All the material obtained was sent to the Pathology Department. Pathologic examination demonstrated no abnormalities on the tissues taken from the aortic valve, aorta and aneurysm.

Case 2.

A 20-year-old man was admitted to the Cardiology Department, because of his atypical chest pain and syncope which occurred for the first time in his life, 15 days before admission.

On physical examination the blood pressure was 100/70 mm Hg and pulse was 68/min and regular. Grade 3/6 systolic and diastolic murmurs were heard at the third and fourth left intercostal area. Laboratory examination revealed only slightly elevated sedimentation rate. The electrocardiogram was normal. The chest X-ray showed moderate cardiomegaly. Two-dimensional echocardiography demonstrated a very large sinus of Valsalva aneurysm originating from the right sinus of Valsalva and the blood was circulating in this aneurysm. The mass extended from the region of the right coronary cusp to the right atrium (Fig.-3). Selective aortogram and right atrial and ventricular angiograms confirmed the presence of a huge (14x17 cm) unruptured right coronary sinus of Valsalva aneurysm (Fig.-4). He underwent total cardiopulmonary bypass operation and had the aneurysm resected; the opening of the aneurysm was closed with a 2x1 cm patch. He did well after the

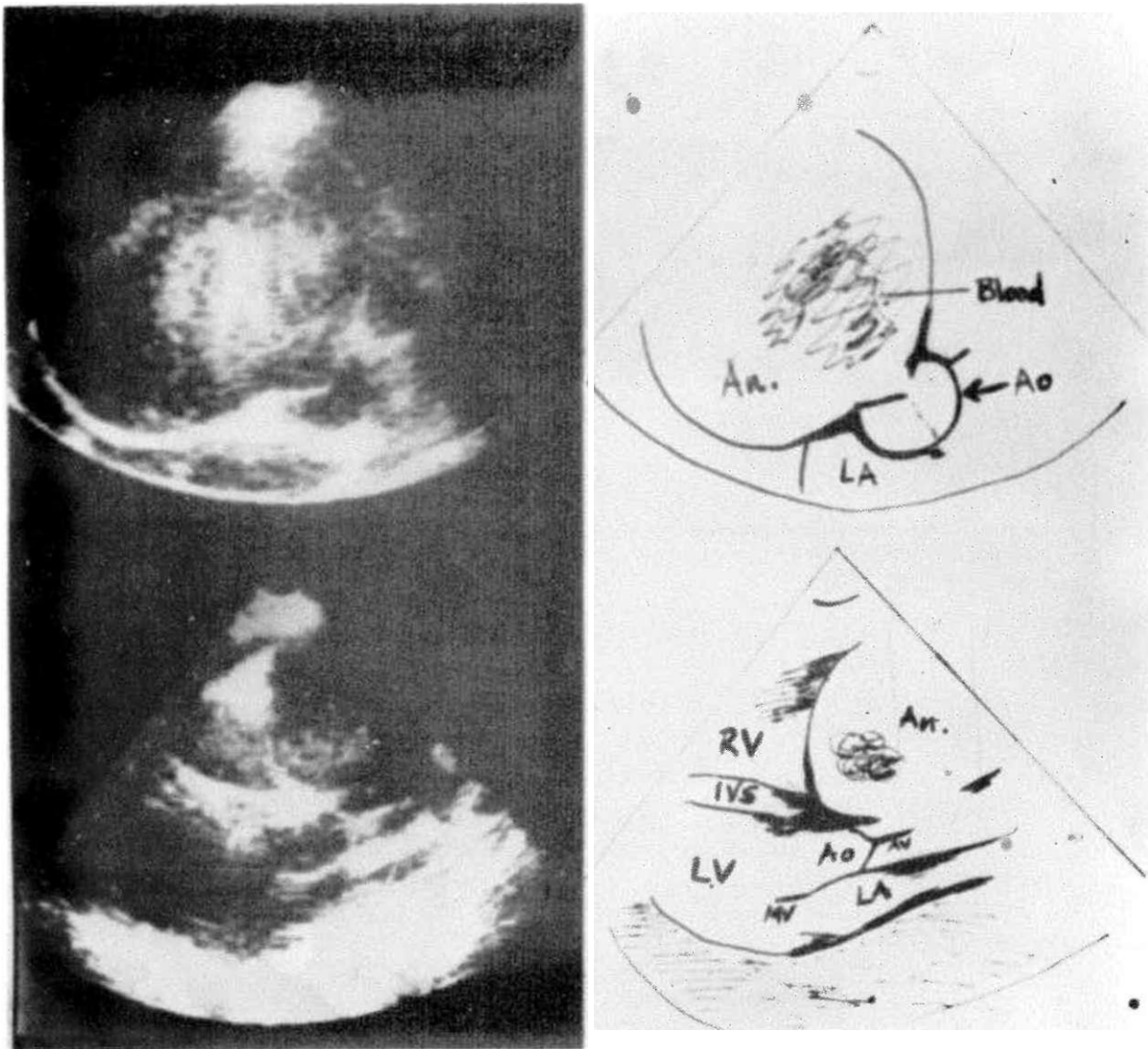


Figure-3. Top, two-dimensional echocardiogram in the parasternal short-axis view showing the giant sinus of Valsalva aneurysm originating from the right sinus. Bottom, the giant aneurysm in the parasternal long-axis view.

On: Schematic drawings:

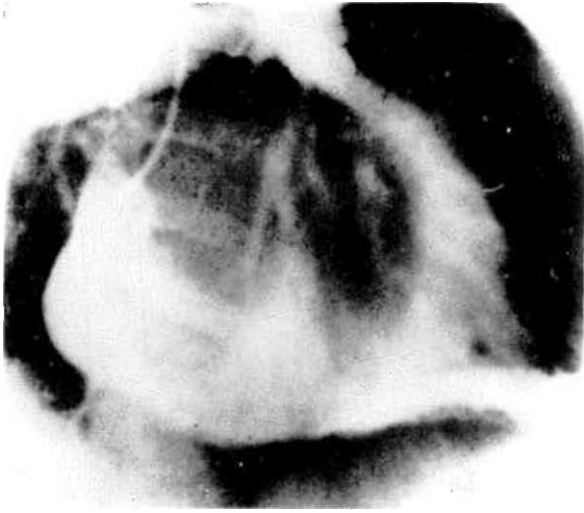
An: aneurysm; Ao: Aorta; Av: Aortic valves; IVS: interventricular septum; LA: left atrium; L.V: left ventricle; MV: mitral valve; RV: right ventricle

operation. Two months after the operation the echocardiographic and chest X-ray findings were completely normal.

DISCUSSION

Two-dimensional echocardiography, which is clearly superior to M-mode echocardiography, has made a great contribution to the diagnosis of the sinus of Valsalva aneurysms after its wide application. The clinical features of the ruptured sinus of Valsalva aneurysms can make it easy to diagnose them (8), so 2 DE is useful especially in asymptomatic patients

with the unruptured ones. Recently 9 cases with the sinus of Valsalva aneurysms, 4 of them unruptured, have been reported which were diagnosed by 2 DE (4-9). Almost all these cases had an aneurysm originated in the right coronary sinus except one (7). One of our cases (Case 1), to our knowledge, is the first report of an unruptured sinus of Valsalva originated in the noncoronary sinus and associated with a bicuspid aortic valve. Angiocardiography and surgery confirmed the diagnosis. This case may be classified as a new type of sinus of Valsalva aneurysm. On the other hand, Case 2 is the largest sinus of Valsalva ever



Figurr-4. Antero-posterior view of right atriogram showing a huge filling defect due to the compression of the sinus of Valsalva.

reported in literature. The clinical findings of our cases were consistent with the findings of the other cases reported in literature (3, 6, 7).

These two cases have proved that the 2 DE is of great benefit in the detection of sinus of Valsalva aneurysms and differentiating this entity from other causes of continuous murmurs.

REFERENCES

1. Taguchi K, N Sasaki, Y Malsuura, R Uemura,: Surgical correction of aneurysm of the sinus of Valsalva: A report of forty-five consecutive patients including eight with total replacement of the aortic valve. *Am. J. Cardiol.* 23:180, 1969.
2. Sakakibara, S, S Konno: Congenital aneurysm of the sinus of Valsalva. Anatomy and classification. *Am. J. Heart* 63:405, 1962.
3. Boutefeu J, PR Moret, C Hahn, E Haul': Aneurysms of the sinus of Valsalva. Report of seven cases and review of the literature. *Am. J. Med.* 65:18, 1978.
4. Shulman R, S Khuri, JB Ray, AE Parisi: Echocardiographic features of an unruptured aneurysm of the right sinus of Valsalva. *Chest.* 77:700, 1980.
5. Engel PJ, JS Held, J Van der Bel-kahn, 11 Spitz: Echocardiographic diagnosis of congenital sinus of Valsalva aneurysm with dissection of the interventricular septum. *Circulation* 63:705, 1981.
6. Lewis BS, NF Agathangelou: Echocardiographic diagnosis of unruptured sinus of Valsalva aneurysm. *Am. J. Heart* 107:1025, 1984.
7. Terdjman M, JP Bourdarias, JC Farcot, P Gueret, O Duhorg, A Ferrier, et al.: Aneurysms of sinus of Valsalva: Two-dimensional echocardiographic diagnosis and recognition of rupture into the right heart cavities. *J.A.C.C.* 3:1227, 1984.
8. Warnes CA, BJ Maron, M Jones, WC Roberts: Asymptomatic sinus of Valsalva aneurysm causing right ventricular outflow obstruction before and after rupture. *Am. J. Cardiol.* 54:1383, 1984.
9. Mok CK, K.L Cheung, RYC Wang: Unruptured right coronary sinus to left ventricle aneurysm diagnosed by cross sectional echocardiography. *Br. Heart J.* 53:226, 1985.