Unruptured and ruptured sinus of Valsalva aneurysms in two cases

İki olguda yırtılmamış ve yırtılmış Valsalva sinüsü anevrizması

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Sinus of Valsalva aneurysms (SVA) are relatively rare lesions with a variable clinical presentation. We presented two patients, one of whom (male, aged 96 years) had an unruptured asymptomatic right SVA without a left-to-right shunt to the right ventricle, and the other (male, aged 33 years) a fistula from the right sinus of Valsalva to the right atrium due to nonpenetrating thoracic trauma. The diagnosis was made by echocardiography in both cases. The elderly patient was followed-up with medical therapy for a year without any complications. The younger patient had complaints of progressive exertional dyspnea and fatigue following blunt substernal and thoracic trauma. He underwent successful surgical repair of the SVA.

Key words: Aortic aneurysm; aortic rupture/surgery; echocardiography; sinus of Valsalva; vascular fistula.

Valsalva sinüsü anevrizmaları (VSA), değişik klinik tablolarla kendini gösterebilen oldukça nadir lezyonlardır. Bu yazıda, biri 96 yaşında, diğeri 33 yaşında iki erkek hasta sunuldu. İlk hastada, yırtılmamış, asemptomatik seyirli ve sağ ventriküle soldan sağa şant yapmayan sağ VSA saptandı. İkinci hastada ise, delici olmayan göğüs travmasını takiben gelişen, sağ Valsalva sinüsünden sağ atriyuma fistül oluşturan VSA vardı. Tanı her iki hastada da ekokardiyografiyle kondu. İlk hasta medikal tedaviyle izlendi ve bir yıl içinde herhangi bir komplikasyon görülmedi. İlerleyici egzersiz dispnesi ve halsizlik şikayetleri olan genç yaştaki hastada ise VSA'nın cerrahi onarımı yapıldı.

Anahtar sözcükler: Aort anevrizması; aort yırtığı/cerrahi; ekokardiyografi; Valsalva sinüsü; vasküler fistül.

Sinus of Valsalva aneurysms (SVA) are relatively rare lesions. They may be congenital or acquired, and sometimes are associated with other cardiac defects such as ventricular septal defect, membranous subaortic stenosis, and aortic regurgitation. The clinical presentation of an SVA is variable, ranging from being asymptomatic to symptoms of heart failure and death.[1] Echocardiography is the major diagnostic tool for SVAs.[2] The incidence of fistulous connection due to penetrating cardiovascular injuries has been reported to be approximately 5%, the vast majority of which are ventricular septal defects.[3] The occurrence of aorto-right atrial fistulae is rare following blunt thoracic trauma.[4]

We presented two patients, one of whom had an unruptured asymptomatic right SVA, and the other a fistula from the right sinus of Valsalva to the right atrium due to nonpenetrating thoracic trauma.

CASE REPORT

Case 1– A 96-year-old male patient with a history of hypertension was referred to our clinic for detailed evaluation of hypertension and target tissue damage. He did not have diabetes, but had been smoking a pack of cigarette a day for 20 years. His blood pressure was 140/80 mmHg and pulse rate was 75 beat/min; other findings of physical examination were normal. Cardiac and mediastinal shadows were normal on the chest radiogram. Electrocardiography showed sinus rhythm and nonspecific T waves; there was no evidence for biventricular hypertrophy. Echocardiography revealed an enlarged right SVA (Fig. 1). Color Doppler echocardiography did not show a left-to-right shunt between the SVA and the right ventricle. Coronary angiography was recommended, but the patient did not accept further evaluation. He was discharged with medical therapy and was well at the first-year follow-up.

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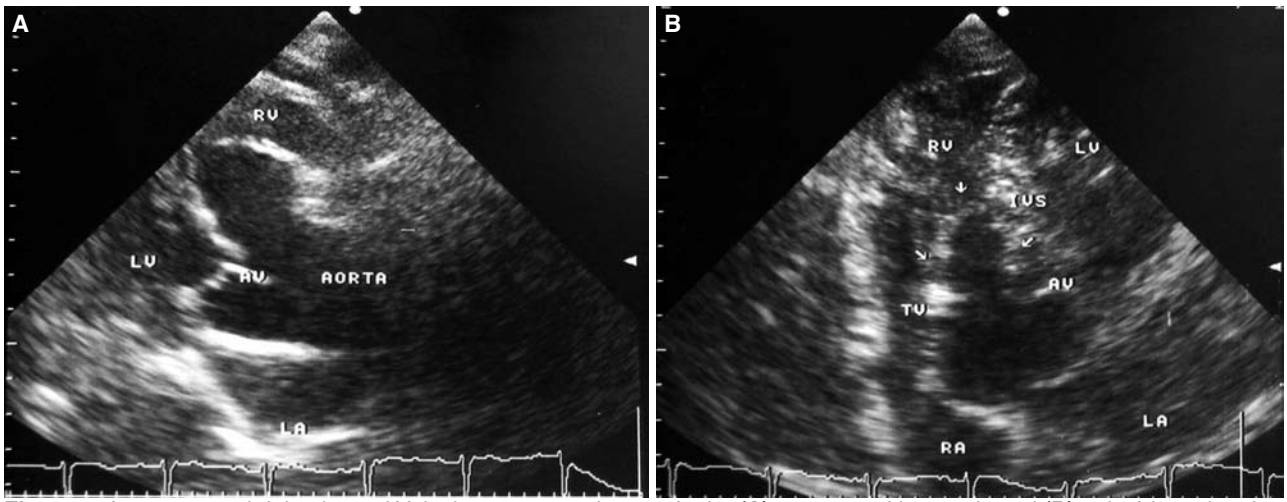

Figure 1. An unruptured right sinus of Valsalva aneurysm is seen in the **(A)** parasternal long-axis and **(B)** apical four-chamber views. AV: Aortic valve; IVS: Interventricular septum; LA: Left atrium; LV: Left ventricle; RA: Right atrium; RV: Right ventricle.

Case 2– A 33-year-old male was admitted to our clinic with progressive exertional dyspnea and fatigue of two-month history. He had no history of heart disease, hypertension, or diabetes, but he reported blunt substernal and thoracic trauma due to a squeeze by the steering wheel that happened two months before. His blood pressure was 140/50 mmHg and pulse rate was 70 beat/min. He had a grade 4/6 continuous cardiac murmur, louder in systole, best audible over the left third and fourth intercostal spaces and right sternal border, radiating to the subxiphoid area. The patient's functional capacity was class 2-3 according to the New York Heart Association classification. His electrocardiogram and chest radiograph were normal. There was no cardiomegaly on his chest X-ray. Echocardiography showed an enlarged right SVA (Fig. 2a, b). Color Doppler echocardiography showed a left-to-right shunt between the right SVA and the right atrium (Fig. 2c). Aortography showed a ruptured and dilated right SVA forming a fistula from the aorta to the right atrium (Fig. 2d). Coronary arteries were normal without any cardiac anomaly. The patient underwent surgical repair of the SVA using patches. The postoperative course was uneventful with no A-V block and/or aortic valve regurgitation, and he was discharged on the seventh postoperative day. He was normal at one-month follow-up after surgery, but was lost to follow-up for subsequent controls.

DISCUSSION

Sinus of Valsalva aneurysms are rarely seen. The most common etiology is spread of infective endocarditis and formation of a ring abscess.[5] Unruptured SVAs are usually silent and may remain unrecognized until they are found incidentally at necropsy or during diagnostic procedures for other suspected cardiac or noncardiac thoracic lesions.[1]

Congenital SVA occurs mostly in males (male-to-female ratio, 4:1), with a typical presentation in young adults.[6] A right SVA may rupture into the right ventricle or the right atrium, as seen in case 2. Rarely, congenital SVAs may dissect into the interventricular septum, and then rupture into the right ventricle or left ventricle.[5] They may originate from the right coronary sinus (90%), noncoronary sinus (8%), or rarely from the left coronary sinus (2%).[2] It is difficult to assess the prevalence of unruptured SVAs because they rarely cause symptoms and may even be missed at necropsy.[7] They may remain clinically silent as in the case of the 96-year-old patient with hypertension. However, SVAs have been reported as a possible source of complications such as spontaneous rupture, thrombosis of the aneurysm with subsequent closure of the coronary artery, emboli of the cerebral arteries, or kinking of the coronary arteries.[1,7] Therefore, early prophylactic surgical treatment of the aneurysm would be a simpler procedure, preventing the development of these complications.

Whereas surgical repair of ruptured and unruptured symptomatic SVAs is considered the optimal treatment modality, management of unruptured asymptomatic SVAs is still controversial. Either aneurysmal expansion with gradual dilatation of the aortic annulus[8] or stability of aneurysm dimensions and clinical manifestations[1] have been reported during follow-up of asymptomatic patients with an unruptured SVA. Surgical repair of SVAs was found to be associated with an acceptably low incidence of both intraoperative and late adverse events and with an improved survival.[1,8] In the absence of coexistent

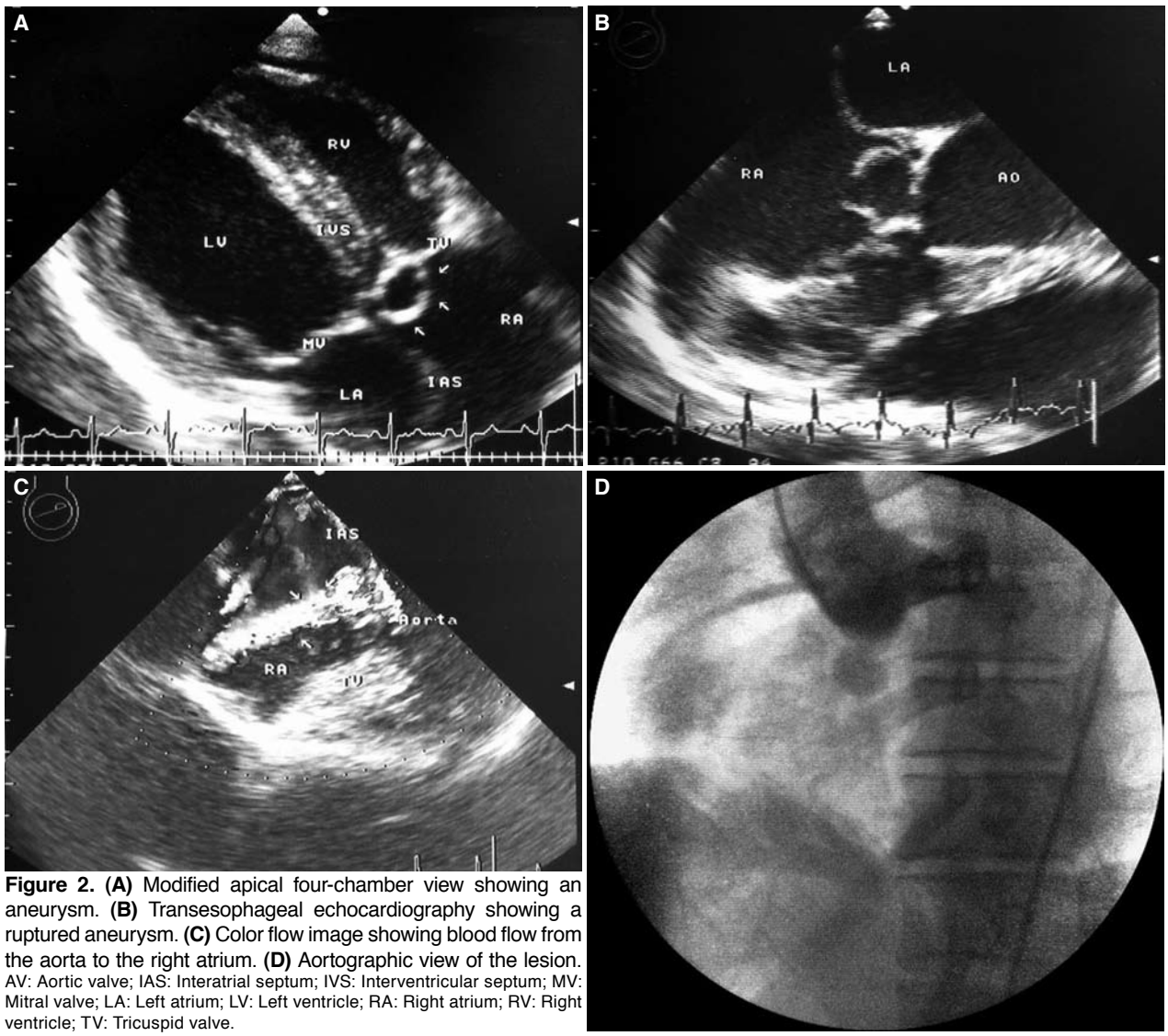

Figure 2. (A) Modified apical four-chamber view showing an aneurysm. **(B)** Transesophageal echocardiography showing a ruptured aneurysm. **(C)** Color flow image showing blood flow from the aorta to the right atrium. **(D)** Aortographic view of the lesion. AV: Aortic valve; IAS: Interatrial septum; IVS: Interventricular septum; MV: Mitral valve; LA: Left atrium; LV: Left ventricle; RA: Right atrium; RV: Right ventricle; TV: Tricuspid valve.

cardiac anomalies, long-term results of surgical treatment of ruptured SVAs are excellent since the risk for recurrent fistula or ventricular septal defect is minimal in the current era.[9]

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