

Repair of an isolated right coronary sinus Valsalva aneurysm accompanied by mitral valve regurgitation and coronary artery disease: a case report

Mitral kapak yetmezliği ve koroner arter hastalığının eşlik ettiği izole sağ sinüs Valsalva anevrizmasının tamiri: Olgu sunumu

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Unruptured aneurysm of sinus of Valsalva is rare. In this article, we report the surgical treatment of a 68-year-old male patient with unruptured aneurysms of the right sinus of Valsalva, mitral regurgitation and coronary artery disease. The treatment of our case consisted of preservation of the aortic valve, replacement of isolated right sinus Valsalva with Dacron patch and reimplantation of the right coronary artery onto this patch. Aortic valve preserving technique can be preferred in cases involving one single sinus Valsalva and the aortic valve is not involved.

Key words: Aneurysm sinus of Valsalva; coronary artery disease; mitral regurgitation.

Sinus Valsalva aneurysms (SVAs) are seen in about 0.15-0.5% of patients that have undergone a cardiopulmonary bypass.^[1] Involvement of the right coronary sinus is seen in about 70% of the patients, whereas involvement of the non-coronary sinus occurs at a rate of 29% and involvement of the left coronary sinus is found in only 1%. Sinus Valsalva aneurysms can develop secondary to congenital or acquired syphilis, bacterial endocarditis, atherosclerosis, aorta dissection, or trauma.^[2]

Indication for repair is usually identified immediately after the diagnosis, with the appropriate technique varying according to the number of enlarged sinuses, whether or not the aneurysm is ruptured, and whether or not the aneurysmal sac has an orifice. Closing the

Rüptüre olmamış sinüs Valsalva anevrizması nadirdir. Bu yazıda rüptüre olmamış sağ sinüs Valsalva anevrizması, mitral yetmezliği ve koroner arter hastalığı bulunan 68 yaşında bir erkek hastanın cerrahi tedavisi sunuldu. Olgumuzun tedavisi aortik kapak korunması ile birlikte izole sağ sinüs Valsalvanın Dacron yama ile değiştirilmesi ve sağ koroner arterin bu yamanın üzerine yeniden implantasyonu ile ilgilidir. Aort kapağının etkilenmediği tek sinüs Valsalva tutulumunda aort kapak koruma tekniği tercih edilebilir.

Anahtar sözcükler: Sinüs Valsalva anevrizma; koroner arter hastalığı; mitral yetmezlik.

orifice with a patch is the standard approach for SVAs, but some authors recommend aortic valve-preserving surgery when more than one sinus is involved. However, when this is the case, the aortic valve is more affected, and the repair is more difficult.^[3,4]

In this study, we report on a patient with SVA together with right coronary artery disease who underwent surgery in our clinic.

CASE REPORT

A 68-year-old male applied to our clinic with chest pain and palpitation. Ischemic cardiac disease was found on an electrocardiogram (ECG) and other effort tests. One isolated right sinus coronary aneurysm



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extending towards the outlet of the right ventricle was found in an echocardiogram; however, aortic valvular insufficiency was not found. Rupture of the chord in the anterior leaflet of the mitral valve and advanced mitral insufficiency was also noted. A tomogram also revealed that there was one right coronary sinus aneurysm 5.2x3.7 cm in size and that the right coronary artery (RCA) originated from the aneurysmal sac. In the coronary angiogram, there was a 30% narrowing in the left anterior descending artery (LAD) and the LAD proximal, a 90% narrowing in the circumflex obtuse marginal 1 branch (CxOM1), and a 40% narrowing in the mid-portion of the RCA (Figure 1). The left ventricular (LV) ejection fraction (EF) was 45. After examining all of the data, the decision for coronary artery bypass and repair of the SVA was made.

A median sternotomy was performed, and the left internal mammary artery (LIMA) was released. Cardiopulmonary bypass (CPB) was established after placing an arterial cannula into the ascending aorta and bicaval venous cannulations. The ascending aorta was then clamped. Next, the heart was arrested with cold crystalloid cardioplegia. The LIMA-CxOM1 coronary bypass was performed, and the flow in the LIMA was cut using a bulldog clamp. An aortotomy was made transversely, and the aorta along with the left and noncoronary sinus of Valsalva were normal. The right coronary sinus of Valsalva was aneurysmatic, but the right and all other aortic annuli as well as the aortic valve were normal. An aneurysmal sac of about 4x3.5x3 cm

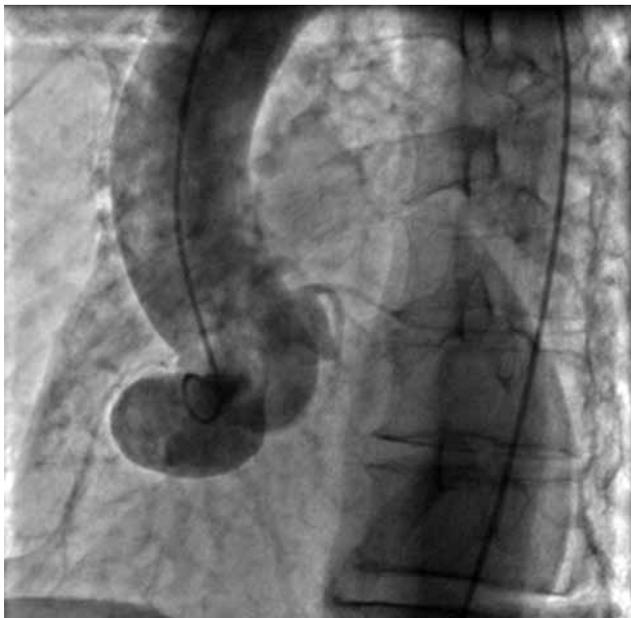


Figure 1. Angiographic appearance of the right sinus of Valsalva aneurysm.

in size was visualized in the RCA sinus localization, and the right coronary ostium was localized within the aneurysmal sac. Hence, it was decided to preserve the aortic valve. Later, a standard left atriotomy was performed, and the mitral valve was explored, which

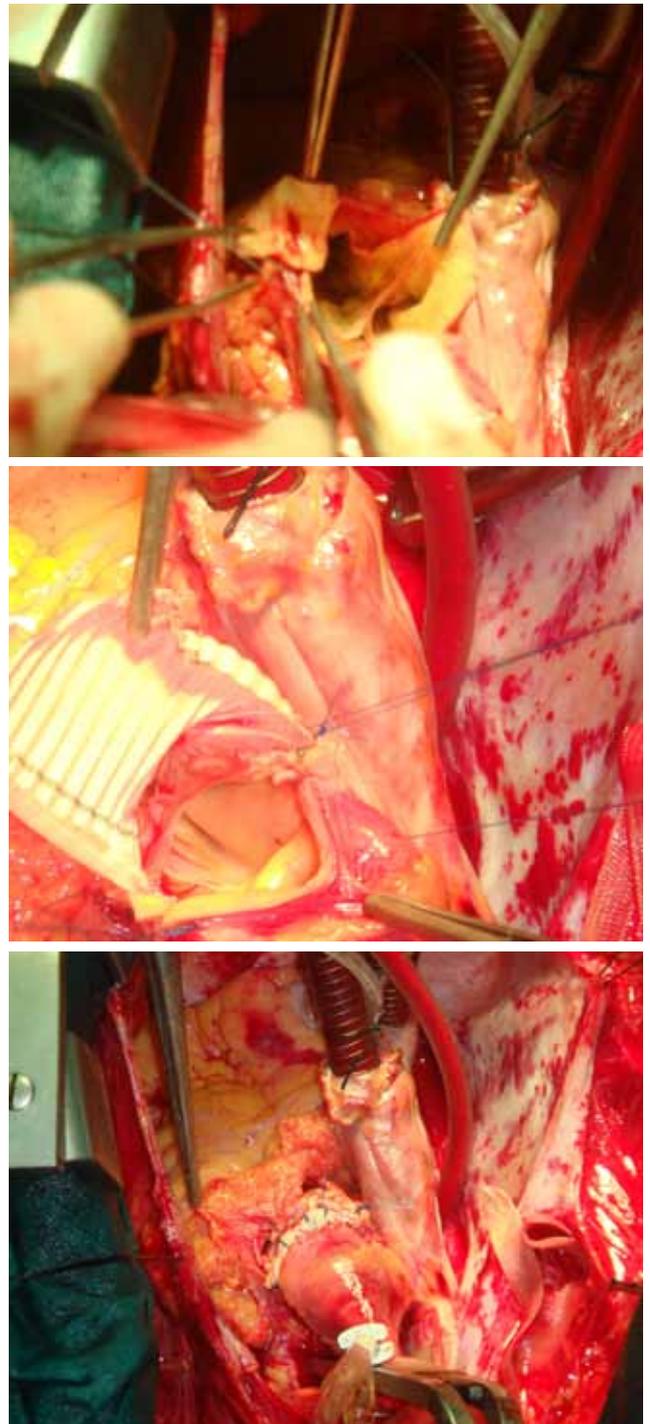


Figure 2. An intraoperative photo showing the right coronary sinus aneurysm that was replaced with a Dacron patch and right coronary artery button onto the graft.

showed elongation and rupture of the anterior leaflet main chords. It was thought that repair would not be adequate, and replacement was performed with a 27-mm Sorin bileaflet mechanical valve (Sorin Biomedica, Saluggia, Italy). The left atriotomy was closed, and aortic repair was commenced. The right sinus of Valsalva was excised, leaving a rim of approximately 5 mm above the aortic annulus. The RCA had a structure resembling a button. To restructure the right coronary sinus, the distance between the two commissures were closed, and a Dacron graft was prepared of adequate dimensions. Continuous sutures were placed towards both of the commissures, one from the lower end of the graft cut in order to give U-shape and one from the mid-portion of the annular area of the right coronary sinus, which started with pledgeted 3-0 prolene sutures. After suturing the graft, the RCA was reimplanted onto the Dacron graft with 5-0 prolene sutures, and the coronary ostial opening was checked (Figure 2). The transverse aortotomy was closed with 4-0 prolene sutures continuously in two rows by uniting with the graft patched to the RCA. Following degassing with the aortic vent, the cross-clamp was removed, and the heart was activated. Cardiopulmonary bypass was disconnected following warming.

The patient had no hemodynamic impairment or drainage problem during the follow-up in the intensive care unit (ICU), and he also experienced no electrocardiographic transmission problems. He was transferred to regular room on postoperative day two, and hemodynamic and vital signs were stable during the whole follow-up period. In the control echocardiogram taken on postoperative day six, the graft was in the localization of the right coronary sinus, and there were no impairments or insufficiencies in the structure of the aortic valves. The control ECG gave normal sinus rhythm, and the patient was discharged on postoperative day seven with recommendations for medical treatment.

DISCUSSION

Acquired aneurysms of the sinus of Valsalva are reported less frequently than congenital SVAs.^[1,2] Here, we describe the surgical treatment of one patient who had acquired, unruptured aneurysms of the right sinus of Valsalva.

An unruptured SVA is usually asymptomatic and is often found incidentally. However, in this condition, aortic insufficiency, right ventricular outflow tract obstruction, tricuspid stenosis and regurgitation, myocardial ischemia or infarction, conduction disturbances with septal penetration, mediastinal masses, infective

endocarditis, thromboembolisms, and rupture can be the manifestations of distortion or compression in the adjacent structures. Our patient complained of angina pectoris and palpitation related to the accompanying coronary artery disease and mitral insufficiency. Trans-thoracic and trans-esophageal echocardiography, computed tomography (CT), angiography, cardiac catheterization, and magnetic resonance imaging (MRI) are used for diagnosis.^[5] In our case, the diagnosis of SVA was made with echocardiography.

Unless specific contraindications exist, surgical repair of an unruptured SVA must be the choice of treatment in symptomatic cases, in cases with rupture, and in cases discovered incidentally at the time of surgery for other cardiac pathologies. The best surgical procedures for these aneurysms are the exclusion of the aneurysm sac and the closure of the sinusal defect using an expanded PTFE or pericardial patch. The use of the PTFE patch is preferred over pericardial patch closure or direct closure of the defect to prevent the possibility of aortic valve leaflet deformity and/or coronary ostial narrowing. Adjuvant procedures, such as aortic valve-sparing procedures or aortic valve or aortic root replacement in cases of associated aortic regurgitation or aortic root distortion, can also be included in the surgical repair. As the repair offers no guarantee against fatal conduction abnormalities, prophylactic permanent pacemaker implantation was preferred in patients having extensive ventricular septal extension, as was seen in our case.^[5] Our patient had no symptoms related to SVA but had symptoms related to advanced mitral insufficiency and coronary artery disease that often accompany this type of aneurysm. We preserved the aortic valve in our case and made a resection for the isolated aneurysmal right sinus. The sinus Valsalva was replaced with a Dacron patch, and the RCA was reimplanted onto this patch.

In another case report that was previously published, the enlarged sinus Valsalva was repaired with a patch, and the ascending aorta was replaced with a tube graft without replacing the aortic valve.^[6] The repair technique with the patch graft used in that case was much more complicated than ours because we used only one patch graft, and no tube graft was needed.

In conclusion, we successfully performed the repair of an unruptured aneurysm involving only one coronary sinus Valsalva with a patch graft, which resulted in preserving the aorta. We believe that this technique can be performed safely and without complications for unruptured cases involving only one sinus Valsalva that do not involve the aortic valve.

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