

Sol Ventrikül Çıkım Yolu Darlığı ile Beraber Mitral Kapak Darlığı ve Asandan Aort Anevrizması Olan Hastada Aortoventriküloplasti: Olgu Sunumu

AORTOVENTRICULOPLASTY IN A PATIENT WITH COMPLEX LEFT VENTRICULAR OUTFLOW TRACT OBSTRUCTION, MITRAL VALVE STENOSIS AND ANEURYSM OF THE ASCENDING AORTA: CASE REPORT

Hasan Karabulut, Cem Alhan, Fevzi Toraman, Serdar Evrenkaya, Sümer Tarcan

Acıbadem Hastanesi, Kalp Damar Cerrahisi Bölümü, İstanbul

Özet

Ciddi sol ventrikül çıkım yolu obstrüksiyonu ile seyreden ve kalsifik mitral stenozu, valvüler aort stenozu ve asandan aort anevrizması olan bir hastada yeni bir aortoventriküloplasti yöntemi tarif etmekteyiz. Bu kompleks patolojilerin bulunduğu hastada tedavi her iki kapağın replasmanı ve dakron tüp grefti ile başarıyla uygulanmıştır. Dacron tüp greftin proksimal ucu ile ventriküler septum ve aort kökü onarımı tamamlanmış, distal uç ise distal aortaya anastomoz edilmiştir. Hastanın ameliyat sonrası dönemi sorunsuz seyretmiş ve yapılan postoperatif ekokardiyografide sol ventrikül çıkım yolunda belirgin gradyan saptanmamıştır.

Anahtar kelimeler: Aortoventriküloplasti, mitral stenoz, asandan aort anevrizması

Türk Göğüs Kalp Damar Cer Derg 2003;11:122-124

Summary

We describe a new method of aortoventriculoplasty in a patient with calcified mitral stenosis, aortic valvular stenosis, severe left ventricular outflow tract obstruction, and aneurysm of the ascending aorta. This complex pathology was successfully treated with replacement of the both valves and a tubular dacron graft. The proximal end of the dacron tube was tailored as a patch for the repair of the ventricular septum and the aortic root, and the distal end was anastomosed to the distal ascending aorta. The patient had an uneventful recovery and postoperative echocardiography showed no significant residual gradient on the left ventricular outflow tract.

Keywords: Aortoventriculoplasty, mitral stenosis, aneurysm of the ascending aorta

Turkish J Thorac Cardiovasc Surg 2003;11:122-124

Introduction

Aortoventriculoplasty (AVP), first reported by Konno and associates [1], in 1975 and by Rastan and Koncz [2] in 1976 is one of the most aggressive surgical approaches for the elimination of the left ventricular outflow tract obstruction (LVOTO). This method allows the implantation of a prosthetic valve three or four sizes larger than the original size of the annulus. We describe a new method of AVP in a patient with mitral stenosis, aortic valvular stenosis, severe LVOTO, and aneurysm of the ascending aorta.

Case

A 48-year-old man was admitted to our hospital with congestive heart failure. Exertional dyspnea since childhood was noted in his past history. A transthoracic echocardiogram revealed left ventricular hypertrophy and systolic dysfunction with an ejection fraction of 0.35, severe LVOTO (subaortic membrane, annular and valvular aortic stenosis), moderate

aortic regurgitation, aneurysm of the ascending aorta, and calcified mitral valve stenosis. The peak LVOT and mitral valve gradients were 104 and 16 mmHg, respectively. At catheterization, left ventricle could not be entered. At the time of the operation, aneurysmal segment of the ascending aorta, stenotic aortic valves and a fibrotic subaortic membrane were resected, but LVOT was still severely stenotic and a 19 mm valve sizer could not be inserted. Through a standard left atriotomy a heavily calcified mitral valve was excised and replaced with a No. 27 St. Jude HP (St. Jude Medical, Inc, St. Paul, MN) mechanical prosthesis inserted. This procedure led to the further narrowing of the LVOT. The decision was made for an aortoventriculoplasty and aortotomy incision was extended into the right aortic sinus. The free wall of the right ventricle and the interventricular septum was incised as in a standard AVP procedure (Figure 1A). The aneurysmal portion of the ascending aorta was excised. The left and noncoronary sinuses of Valsalva were free of aneurysm and left in place (Figure 1B). One end of a 30 mm Dacron tubular graft was tailored as a patch for the repair of the interventricular septum

Adres: Dr. Hasan Karabulut, Acıbadem Hastanesi, Kalp Damar Cerrahisi Bölümü, İstanbul
e-mail: hasankarabulut@turk.net

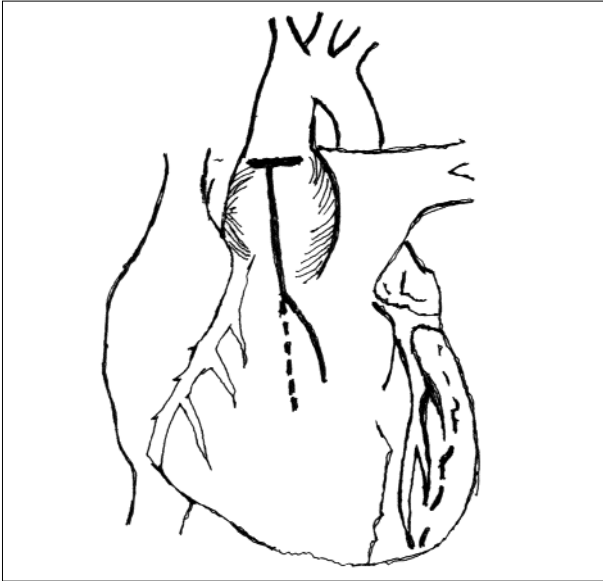


Figure 1A. The aortic and the right ventricular incisions (solid line) and the incision of the interventricular septum (dashed line) are shown.

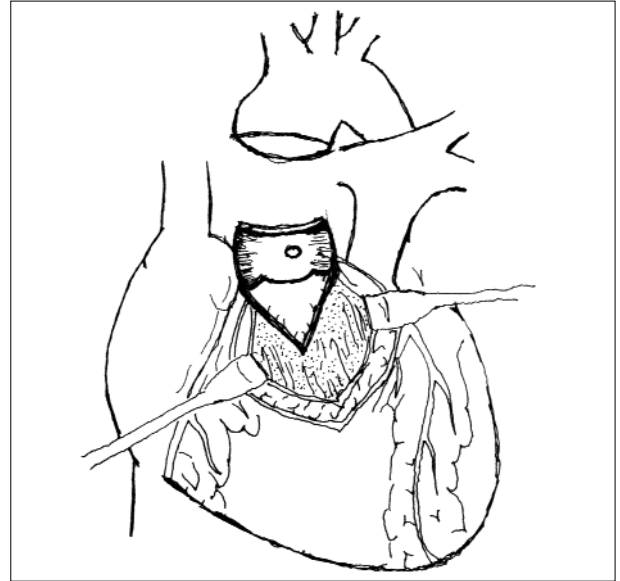


Figure 1B. The aneurysmal portion of the ascending aorta is excised, and the sinuses of Valsalva that are free of aneurysm are left in place.

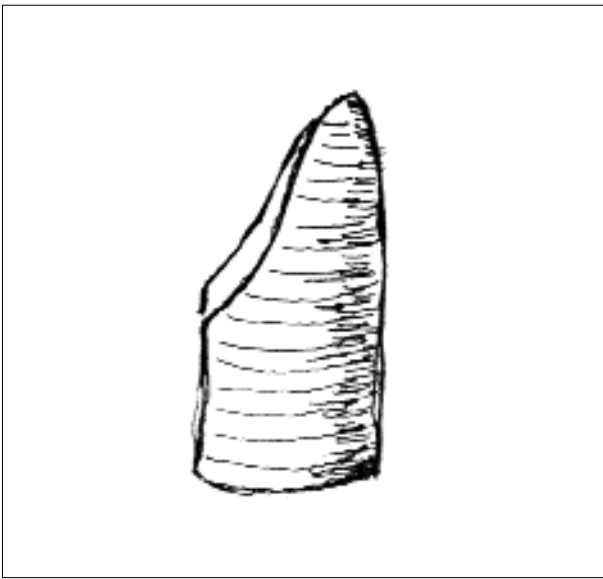


Figure 1C. One end of a 30 mm Dacron tubular graft is tailored for patch closure of the interventricular septum and the aortic root.

and the aortic root (Figure 1C). This part of the graft was sutured to the interventricular septum with a continuous 3-0 polypropylene suture. This suture was interrupted at the aortic annulus, and a 27 mm valve sizer was inserted without any difficulty through the new annulus. A No. 27 St. Jude HP (St. Jude Medical, Inc, St. Paul, MN) mechanical prosthesis was secured to the aortic annulus and the patch with two-third of the sutures passing through the native annulus, and one-third from the patch. The portion of the patch distal to the annulus was

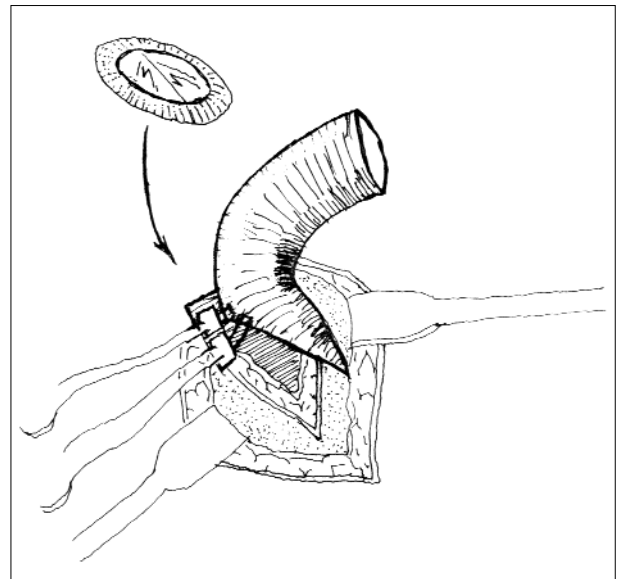


Figure 1D. This part of the graft is sutured to the interventricular septum with a continuous 3-0 polypropylene suture and this suture is interrupted at the aortic annulus, and a mechanical prosthesis is secured to the aortic annulus and the patch with two-third of the sutures passing through the native annulus, and one-third from the patch. The portion of the patch distal to the annulus is sutured to the aortic sinus and aorta with a continuous 4-0 polypropylene suture. The distal end of the graft is sutured to the distal ascending aorta with a continuous 3-0 polypropylene suture.

sutured to the aortic sinus and aorta with a continuous 4-0 polypropylene suture. The distal end of the graft was

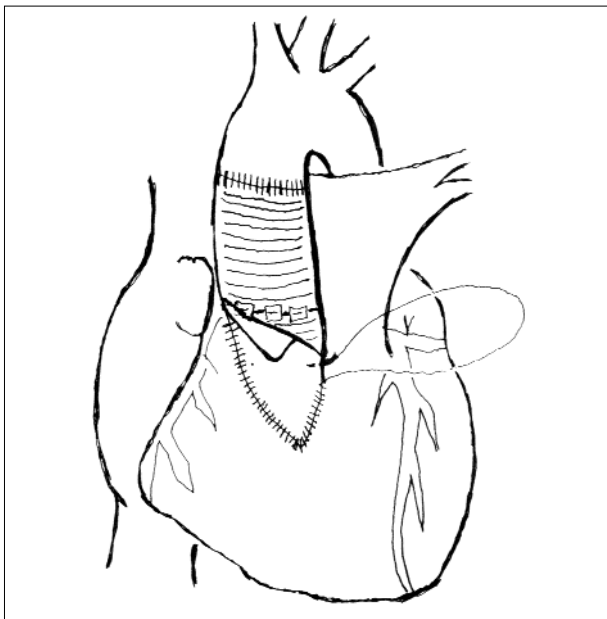


Figure 1E. The right ventricular outflow tract is closed with a separate triangle-shaped patch of Dacron.

anastomosed to the distal ascending aorta with a continuous 3-0 polypropylene suture (Figure 1D). The right ventricular outflow tract was closed with a separate triangle-shaped patch of Dacron (Figure 1E). Antegrade and retrograde blood cardioplegia was used for myocardial protection. The ischemic and cardiopulmonary bypass time was 186 and 200 minutes, respectively. The patient was extubated within 6 hours and discharged from the intensive care unit at 17th hour, had an uneventful recovery and was discharged from the hospital at the 6th postoperative day. Echocardiographic peak gradients on the mitral and aortic valve measured 3 weeks after the operation were 6 and 12 mmHg, respectively.

Discussion

Anterior aortic annular enlargement, the aortoventriculoplasty, is performed for various types of left ventricular outflow tract obstruction. The procedure was described by Konno and colleagues primarily for subaortic and annular stenosis and is more commonly utilized in pediatric patient than in adults [3,4]. It has been shown that aortic valve replacement with small prosthetic valves adversely affects long-term survival by increasing the risk of late sudden death [5]. However, AVP with its excellent hemodynamic results [6], offers a similar long-term survival as of standard aortic valve replacement [7]. It seems to be the most acceptable procedure in a patient with

LVOTO and concomitant mitral valve replacement, since a prosthetic mitral valve excludes the possibility of posterior annuloplasties such as the Nicks and Manouguian procedures. This operative technique usually permits implantation of a prosthetic valve two sizes larger than the original size of the aortic annulus. Aortoventriculoplasty is a complex operation that should be performed only by experienced surgeons. It may lead to serious complications if it is not executed carefully. Bleeding along the suture lines is a common problem that can be avoided by careful suturing and avoidance of excessive tension. Other complications that may occur are damage to the first septal perforator artery, and conduction pathways to cause left bundle branch block, right bundle branch block and even complete heart block. Another problem that may be encountered is dehiscence of the patch from the interventricular septum with communication between the left and right ventricles. This problem may require reoperation for correction of the ventricular septal defect. The mortality rate for AVP has been reported as low as 5.5% [8]. The technique we report here seems to be safe and effective in the treatment of this rare and challenging pathology.

References

1. Konno S, Imai Y, Iida Y, Nakajima M, Tatsuno K. A new method for prosthetic valve replacement in congenital aortic stenosis associated with hypoplasia of the aortic valve ring. *J Thorac Cardiovasc Surg* 1975;70:909-17.
2. Rastan H, Koncz J. Aortoventriculoplasty: A new technique for the treatment of left ventricular outflow tract obstruction. *J Thorac Cardiovasc Surg* 1976;71:920-7.
3. Sarıoğlu T, Bilal MS, Kınacıoğlu B, et al. Konno Rastan operasyonu ile sol ventrikül çıkım yolu rekonstrüksiyonu. *Türk Göğüs Kalp Damar Cer Derg* 1995;3:226-31.
4. Sarıoğlu T, Mert M, Bilal MS, et al. Sol ventrikül çıkım yolu darlıklarında aortoventriküloplasti operasyonunun orta-uzun dönem sonuçları. *Türk Göğüs Kalp Damar Cer Derg* 1998;6:405-11.
5. Kratz JM, Sade RM, Crawford FA Jr, Crumbley AJ, Stroud MR. The risk of small St. Jude aortic valve prostheses. *Ann Thorac Surg* 1994;57:1114-8.
6. Vogt J, De Vivie ER, Koncz J, Beuren AJ. Haemodynamic and echocardiographic findings after aortoventriculoplasty. *Eur Heart J* 1986;7:501-8.
7. De Vivie ER, Borowski A, Mehlhorn U. Reduction of the left ventricular outflow-tract obstruction by aortoventriculoplasty: Long-term results of 96 patients. *Thorac Cardiovasc Surg* 1993;41:216-23.
8. Misbach GA, Turley K, Ulliyot DJ, Ebert PA. Left ventricular outflow enlargement using the Konno procedure. *J Thorac Cardiovasc Surg* 1982;84:696-703.