

Aort Kökü Cerrahisinde Kanamaların Önlenmesinde Modifiye Güvenli Bir Yöntem

A MODIFIED AND SAFE PROCEDURE FOR PREVENTION OF BLEEDING IN AORTIC ROOT SURGERY

Denyan Mansuroğlu, Nilgün Ulusoy Bozbuğa, Suat Nail Ömeroğlu, Adil Polat, Kaan Kırallı, Gökhan İpek, Cevat Yakut

Koşuyolu Kalp Eğitim ve Araştırma Hastanesi, Kalp Damar Cerrahisi Kliniği, İstanbul

Özet

Aort kökü cerrahisinde proksimal anastomozun posterior sütür hattından ve sol koroner arter buton anastomozundan meydana gelebilecek kanamalar özellikle kros klemp kaldırıldıktan sonra ciddi zorluklara yol açarak mükemmel bir cerrahi prosedürü bozabilir. Biz burada distal anastomoz yapılmadan ve kros klemp kaldırılmadan önce iki basamaktan oluşan kanama kontrolü yöntemini tanımlamaktayız.

Anahtar kelimeler: Modifiye Bentall prosedürü, kanama, aort kökü cerrahisi

Summary

Türk Göğüs Kalp Damar Cer Derg 2005;13:167-168

Hemostasis and bleeding control from posterior suture line of proximal aortic anastomosis and left coronary artery button creates a great challenge after removal of the cross clamp during aortic root replacement. Bleeding from anastomotic lines is always risk in aortic root surgery and can destroy an otherwise excellent surgical procedure. We describe herein a modified method consisting of two steps for control of bleeding before performing the distal anastomosis and removing the cross clamp.

Keywords: Modified Bentall procedure, bleeding, aortic root surgery

Turkish J Thorac Cardiovasc Surg 2005;13:167-168

Geliş Tarihi: Ocak 2004

Revizyon: -

Kabul Tarihi: 19 Nisan 2004

Introduction

Replacement of the aortic root, first performed by Bentall and DeBono in 1968, has been applied to a variety of aortic diseases for providing the aortic valve and ascending aorta in continuity [1]. The most important keys to successful aortic root replacement appear to provide effective hemostasis, and elimination of tension on the anastomoses, particularly annular and coronary ostial anastomoses.

Bleeding has been a dreaded complication in patients undergoing aortic surgery. Reimplantation of coronary arteries to the composite graft during aortic root replacement with a flanged modification of the classical Bentall operation is performed with excellent long-term results in our institute [2]. Hemostasis and bleeding control from posterior suture line of proximal aortic anastomosis and left coronary artery button creates a great challenge after removal of the cross clamp during aortic root replacement. During the procedure, bleeding particularly from the left coronary and proximal aortic anastomosis suture lines are hard to control and sometimes require a second cross clamp period in order to review the anastomosis or incising the graft for controlling the bleeding from the inner aspect. Although the methodology of hemostasis

varies among cardiovascular surgery centers, the need for control of bleeding is accepted in routine aortic root surgery. We describe herein an modified method for control of bleeding before performing the distal anastomosis and removing the cross clamp.

Technique

Technical details for flanged composite graft were described before. The flanged technique consists of a composite collagen-impregnated Dacron vascular graft and a prosthetic valve with reimplantation of coronary ostia by button technique [3].

The control and hemostasis procedure consists of two steps by filling the heart. An apical venting cannula is placed to the left ventricle apex. The first step for bleeding control method is carried out after the proximal anastomosis performing. While the pressured blood fills up the left ventricle cavity via apical vent, concomitantly blood from the antegrade cardioplegia needle fills graft. The implanted graft is clamped from free distal end and the left ventricle is filled with blood vigorously approximately 100 mmHg pressure. During this process proximal suture line is checked closely for bleeding and if any,

Adres: Dr. Denyan Mansuroğlu, Koşuyolu Kalp Eğitim ve Araştırma Hastanesi, Kalp Damar Cerrahisi Kliniği, İstanbul
e-mail: dmansuroglu@kosuyolu.gov.tr

controlled with separate 4/0 prolene suture. Left coronary anastomosis site is determined as the graft is filled and performed with 6/0 prolene suture. The second step for bleeding control is carried out after completing the left coronary button implantation. The composite graft is filled via antegrade cardioplegia needle on the graft and the left coronary button is checked for bleeding and controlled with 6/0 prolene suture. Right coronary anastomosis site is determined and anastomosis is performed following the steps described as left coronary button. Clamp on the graft is removed and the procedure is succeeded as the distal anastomosis is done with 4/0 prolene suture. After filling and deairing the heart; aortic cross clamp is removed, distal anastomosis is controlled for bleeding and the remaining process is performed in a standardized fashion.

Discussion

For better morphological basis of Bentall procedure and reducing the incidence of complications, a modified flanged technique has been suggested and successfully used at Kosuyolu Heart and Research Hospital [3]. The original technique has been modified for reducing major hemorrhage and leakage from the composite graft and preventing pseudoaneurysm formation at suture lines and progression of aneurysm and/or dissection in the remaining aortic segment, especially in patients with Marfan's syndrome or in patients with aortic dissection. This new technique also provides flexible and secure part of aortic continuity by preventing excess bleeding and narrowing of the root.

But bleeding is still a serious problem for both patient and surgeon in Bentall and its modifications [4]. Bleeding from anastomotic lines is always risk in aortic root surgery and can destroy an otherwise excellent surgical procedure. Previous research for uncontrolled bleeding was done and shunt techniques for classical Bentall procedure were described. Although these complications were lessened with advanced graft making, bleeding from the posterior suture line of proximal anastomosis and the left coronary button are still challenging issues for the surgeon. A successful method for bleeding control by having heart filled and contract spontaneously by warm retrograde blood cardioplegia was

described before [4]. According to our point of view, we do not need the heart contracting spontaneously and moreover, we can control the suture lines with a near normal antegrade physiology with the any pressure possible. The reducing venous return to the pump for few seconds can provide to accomplish left ventricular filling. But this method do not form enough pressure in left ventricle to control the bleeding from the proximal suture line. Although the using of apical vent for controlling can be thought troublesome, this approach is the only filling way to obtain with physiological pressure into the left ventricle. The limitation of this technique, particularly in the former step for proximal anastomosis, is the presence of mitral regurgitation. In case of significant mitral regurgitation, mitral valve should already be either repaired or replaced before aortic root procedure.

Any bleeding that may be seen after removal of the cross clamp shall be prevented in this way. A second cross clamp period, revision of the proximal anastomosis or incision of the graft for bleeding control may be prevented. This will decrease the perfusion period and use of blood and blood products. Another advantage for the latter step for the left button anastomosis is determination of the button site as the graft is filled in order to prevent further distention and distortion at this site.

This new technique provides secure controlling and preventing excess bleeding from the root. Our technique is effective, physiologic and practic to lessen bleeding and additional maneuvers for controll. Moreover, this technique can easily be performed by any surgeon with no additional risk to the patient.

References

1. Bentall H, DeBono A. A technique for complete replacement of the ascending aorta. *Thorax* 1968;23:338-9.
2. Kirali K, Mansuroğlu D, Ömeroğlu SN, et al. Five-year experience in aortic root replacement with the flanged composite graft. *Ann Thorac Surg* 2002;73:1130-7.
3. Yakut C. A new modified Bentall procedure: The Flanged Technique. *Ann Thorac Surg* 2001;71:2050-2.
4. Karamanoukian HL, Dancona G, Ricci M, Bergsland J, Salerno TA. Prevention of bleeding in aortic root surgery. *J Card Surg* 1999;14:390-1.