How to do it

An alternative repair technique for aortic periprosthetic leakage

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Received 28 September 1998; received in revised form 23 November 1998; accepted 1 December 1998

Abstract

In case of aortic periprosthetic leakage, there are several methods of repair. When valve replacement or refixation is not suitable an alternative repair technique, ‘curtaining’ with a Dacron patch to prevent leakage is presented. © 1999 Elsevier Science B.V. All rights reserved.

Keywords: Cardiac surgery; Aortic valve surgery; Periprosthetic leakage

In the series published previously, the incidence of periprosthetic leakage requiring surgery varied between 1 and 12% (5% average). Several factors may result in periprosthetic leakage. These include annular calcification or fragility, infection, size and design of the prosthesis and suture technique. Annular calcification was the most common factor associated with leakage [1].

Repair of an aortic periprosthetic leak may require removal of the prosthetic valve and insertion of a new one. At other times, tissues in the area can be apposed easily through the ascending aorta. Repair of a left-coronary-cusp aortic-periprosthetic leak can be achieved by placing stitches through the main pulmonary artery, right pulmonary artery and left atrium when removal of the previously inserted valve is contraindicated [2]. In selected patients who require repeated approaches to the aortic root, Hufnagel’s original idea to place the prosthetic valve to the descending thoracic aorta is suggested to reduce the severity of aortic insufficiency [3]. In our case, it was not possible to refix the valve to the calcific aorta.

An aortic valve replacement operation with a no. 29 Björk–Shiley disk valve, was performed in 1986 on a male patient 44-years of age. It was noted at the time of operation that aortic annulus was highly calcified. He was admitted to our clinic with 3-4° aortic insufficiency. According to transthoracic echocardiography, prosthetic valve motion was normal but there was periprosthetic leakage.

Reoperation was performed in January 1998. Standard cardiopulmonary bypass techniques were used with femoral
The aortic valve was exposed through transverse aortotomy. Selective cold crystalloid cardioplegia (PLEGISOL, Abbott Laboratories, USA) was given. The prosthetic valve motions were in normal limits and an area of periprosthetic leakage was observed which was started from the non-coronary-right coronary commissure and ended just before the left coronary ostium. The aortic root and sinuses of valsalva showed extensive calcification which extended to the subvalvular apparatus. Due to the extensive calcification it was thought that neither the removal and reimplantation of prosthetic valve nor homograft use was appropriate. Unsuccessful attempts were made to place sutures on the aortic annulus and the valve itself. Then it was decided to place a crescent shaped Dacron patch to prevent leakage (Meadox Medicals, Double velour polyester fabric). U-shaped pledgeted sutures were placed to the aortic wall and non-pledgeted U-shaped sutures were placed to the sewing ring of the prosthetic valve all along the area of leakage. Sutures were passed from the Dacron patch and tied. So, the periprosthetic leakage area was curtained by this technique (Fig. 1). The patient was weaned from cardio-pulmonary bypass without difficulty and after an uneventful postoperative period he was discharged from the hospital with trivial aortic insufficiency. INR level was kept between 3.5 and 4 to prevent thrombus formation just below the Dacron patch. His last transthoracic echocardiography was performed in November 1998, and revealed normally functioning aortic prosthetic valve with 1° insufficiency (Fig. 2).

Repair of aortic periprosthetic leakage may require the removal of the prosthetic valve and an insertion of a new one. If that seems impossible, periprosthetic leakage should try to be repaired by apposing the tissues around the leakage zone. This patch placement technique is suggested for the unusual case in which the periprosthetic leakage didn’t involve the coronary ostia and none of the techniques which were mentioned above seem feasible. This technique is not suggested for cases with active infected endocarditis.

References