Modiﬁed Aortic Root Replacement Technique in Destructive Ventricular-Aortic Discontinuity

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We describe a simple technique for aortic root replacement in destructive prosthetic aortic valve endocarditis wherein the fragile aortic annulus tissue is not suitable for suture placement. Therefore, we ﬁrst reconstructed the intervalvular part with a nontreated pericardial patch and then implanted the aortic composite graft on the aortic root through the roof of the left atrium and reconstructed the defect thus made with another pericardial patch. No complication was seen at 6-month follow up.

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leakage from both sides of the sewing ring (mostly on the postromedial side) secondary to large dehiscence and upward displacement. A large (2.5 cm x 2.7 cm) non-pulsatile echo-free space was detected around the PAV suggestive of a ring abscess. Multiple mobile particles around the sewing ring and valve leaflets were suggestive of vegetations. Color flow Doppler demonstrated a tiny (2-mm) defect in the noncoronary sinus (near its junction to the left coronary sinus), which suggested perforation of the Valsalva sinus to the left atrium. The patient also had severe functional mitral regurgitation.

Because of the extent of the disease and also the severe involvement of the proximal part of the aorta, the team of surgeons decided to replace the aortic root with the proposed technique. We observed no intraoperative bleeding need for further suturing or revision of the aortic root. The initial TEE in the operating room demonstrated an LVEF of 35% to 40% and acceptable results of a hemodynamic study for the mechanical prosthetic mitral valve and replaced aortic valve and aortic root (peak gradient = 28 mm Hg). The follow-up TEE during his uneventful postoperative period and 6 months after operation showed normal left ventricular size and LVEF (40%). Both valves had normal leaflet motion without any paravalvular leakage or mass.

Comment
Several innovative techniques have been used to repair aortic root defects. Danielson and colleagues [4] implanted the PAV in the ascending aorta and used reversed saphenous vein bypass grafting to reconnect the right and left coronary artery systems to the aortic artery. Although this technique promotes abscess healing, the systemic pressure might expand the subannular aneurysm. Brown and colleagues [5] bypassed the aortic root in a dog by inserting a valved conduit between the left ventricular apex and the descending thoracic aorta. A reversed saphenous vein bypass graft connected the descending thoracic aorta and the left anterior descending coronary artery. Although this technique obviates inserting the new prosthetic valve in the infected area, secondary closure of friable necrotic tissue against systemic pressure and adding length and complexity to the operation would be its disadvantages [5]. Implanting either a synthetic [6] or a biological tube graft [7] to the base of the heart and inserting the coronary ostia to the sides of the graft is another technique. Later results have shown that if the aortic annulus is involved, the defect created by the resection should be patched by either autologous or xenogenic pericardium before prosthetic valve implantation [8].

The difficulty in situations like that reported here was the extent of tissue destruction in the aortic annulus (especially the anatomic position of the noncoronary and left coronary leaflets junction) and the intervalvular fibrous body, which resulted in ventricular-aortic discontinuity. Reconstructing the intervalvular fibrous tissue by a pericardial patch has previously been demonstrated [9], but this technique was not applicable in our case because the posteromedial part of the aortic annulus lacked any safe and firm fibrous tissue to attach either the superior part of pericardial patch or the posterolateral part of composite graft. Therefore, we proposed a new
modified technique to reconstruct the intervalvular defect and implant the composite graft on the remnant aortic annulus by the help of the left atrial roof.

References


