We present our standard technique of composite graft replacement performed by a left-handed surgeon. This procedure is performed with a 30-day mortality comparable to that of elective isolated aortic valve replacement.

Keywords: composite-graft • aortic root • left-handed surgeon

INTRODUCTION

Aortic root replacement is indicated in patients presenting with annulo-aortic ectasia and aortic valve dysfunction, to whom aortic valve sparing is not advisable [1]. We preferentially adopt replacement strategy in patients older than 60 years and in those with true bicuspid (Sievers type 0) or pseudo-bicuspid (Sievers type 1 and 2) aortic valve.

Video 1 demonstrates composite graft replacement of the aortic root and proximal arch replacement performed by a left-handed surgeon.

CASE DESCRIPTION

The 51-year-old patient suffered from dyspnea (NYHA functional class II–III). Echocardiography showed annulo-aortic dilatation with severe aortic valve regurgitation. Intraoperative situs confirmed the presence of a bicuspid valve Sievers type 1, with a raphe between the left and right coronary cusps (subcategory L–R).

The composite graft is implanted at the level of the aortic annulus using interrupted Ethibond 2.0 sutures. The coronary arteries are re-implanted with 6.0 Prolene running sutures. To control haemostasis, cardioplegia is instilled into the aortic graft, and fibrin sealant (Evicel®, Ethicon, New Brunswick, NJ, USA) may be used Teflon feet is never used. For the most complete resection of the ascending aorta, core temperature is usually decreased to 28°C (typanic temperature around 24°C), and cardiopulmonary bypass is interrupted. The arterial cannula is removed, and the most cranial part of the ascending aorta is resected. Two catheters are introduced into both common carotid arteries for antegrade selective cerebral protection (flow: 500–800 ml/min, pressure: 50–60 mmHg). The distal anastomosis is performed using a Vascutek Terumo Anteflow (Renfrewshire, Scotland, UK) prosthesis 30 mm (side-arm 8 mm) at the level of the proximal aortic arch. Thereafter, perfusion is restarted through cannulation of the side-arm of the prosthesis. Finally, the coronary anastomoses and the end-to-end anastomosis between the ‘root’ and the ‘arch’ prostheses are performed. Then cardiopulmonary bypass is discontinued, the patient decannulated and the chest is closed in typical way.

RECOMMENDATIONS FOR THE LEFT-HANDED SURGEON

The procedure starts with the suture of the composite graft to the aortic annulus using separated mattress suture of 2.0 Prolene running sutures. The first suture is placed at the level of the commissure between the left and right coronary sinuses, and the following are stitched in a clockwise fashion (back-hand until the middle of the non-acoronary sinus, then forehand) (Fig. 1). The sutures are then stitched through the sewing cuff of the prosthesis which is parachuted down to the aortic annulus. Once this part of the repair has been performed, the temperature has usually reached the targeted core temperature for a brief period of circulatory arrest. The distal anastomosis is then performed, starting at the back side of the proximal aortic arch from inside and stitching the prosthesis from outside-in. Following re-institution of cardiopulmonary bypass, the coronary ostias are re-implanted using continuous 6.0 Prolene sutures. A bovine pericardial strip is used exceptionally (friable coronary buttons and aortic dissection). For the
left-handed surgeon, it is rather easy to start this continuous suture from inside the coronary orifice. The posterior part of the anastomosis is constructed, and then the other end of the suture is performed. For the anterior part of this anastomosis, the suture is stitched from outside the coronary orifice to inside-out of the prosthesis (Fig. 2A). The same is done for the right coronary artery: the suture is stitched (for the back wall) from inside-out of the graft (Fig. 2B) and thereafter from outside-in. The procedure ends with the end-to-end anastomosis between the arch and the root prostheses. Epicardial pacemaker electrodes are placed on the ventricle and the atrium, and the patient is weaned from cardiopulmonary bypass as soon as the core temperature has reached 35.5°C. The pericardium is re-adapted over the vascular graft.

**COMMENT**

Composite graft replacement is an established technique for patients to whom an aortic valve sparing root repair is not suitable [1, 2]. Material refinements have considerably improved the haemostasis of the vascular graft and also at the junction of the valve sewing cuff with the vascular prosthesis. We routinely perform the composite-graft procedure in the open technique. Graft inclusion is applied exceptionally in complex re-operative cases to control haemostasis. In such cases, a xenopericardial patch rather than the native aortic wall is used to cover the vascular prosthesis. In the case of laborious haemostasis, we connect the perigraft space with the right atrium using an 8 mm Gore-Tex graft (Cabrol shunt). Our experience with composite-graft replacement represents 80–100 cases per year with a mortality comparable to that of elective isolated aortic valve replacement (<1.0%).

Being a left-handed individual does not represent any drawback to perform cardiosurgical procedures, and the perioperative risk of patients operated by left-handed surgeons is not increased when compared with that of patients operated by right-handed surgeons [3]. Adusumilli et al. [4] revealed the perceptions of left-handed surgeons in adapting to a right-handed world: he concluded that training duration and surgical performance were similar for right- and left-handed surgeons.
Personally, I do not believe that left-handed surgeons have to adapt to techniques described by right-handed mentors: the left-handed surgeon may simply work back-end when the right-handed surgeon is working forehand and vice versa. Early laterality-related mentoring during surgical residency may reduce the inconveniences that left-handed surgeons could encounter during learning. However, I found some handlings to be facilitated by being left-handed, for instance, the distal anastomosis with the arch open, as well as the re-attachment of the left coronary artery to the composite graft.

REFERENCES