How-to-do-it

A simple method to adapt the height of the sinotubular junction of the De Paulis Valsalva graft to the height of the patient’s sinuses in David reimplantation procedure

Alessandro Mazzola*, Renato Gregorini, Carmine Villani, Raffaele Giancola

Department of Cardiac Surgery, G. Mazzini Hospital, 64100 Teramo, Italy

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Abstract

De Paulis and associated introduced a new aortic root conduit for valve-sparing operation. The use of this prosthesis for David I (reimplantation) procedure occasionally may be problematic when the top of the commissures, do not match the new sinotubular junction of the graft. We propose a simple method that allows to create a new sinotubular junction at the desired level in the skirt portion of the Valsalva prosthesis.

Keywords: Aortic valve-sparing procedure; Aortic root surgery

1. Introduction

Aortic valve-sparing operation has become the gold standard treatment of root aneurysm when the aortic valve leaflets are normal. The remodelling procedure proposed by Sarsam and Yacoub does not prevent late annular dilatation [1]. The reimplantation procedure 'T.David I' is an alternative that provides annular stabilization [2]. The cylindrical shape of the new root in classical T. David I operation predisposes the leaflets to stress so that many variations have been made to the original technique [3–6]. De Paulis introduced a new manufactured prosthesis (Gealweave Valsalva; Sulzer Vascutek, Renfrewshire, Scotland) with a compliant proximal segment [7]. Because the height of the skirt is predetermined in the prosthesis and the height of the sinuses is individually different there is some concern to implant the commissures to the new sinotubular junction [6,8]. We describe a simple method that allows to tailor a new sinotubular junction in the De Paulis Valsalva conduit when the height of the patient sinuses are shorter than the height of the skirt.

2. Technique

After the excision of the diseased aortic wall and sinuses a Valsalva graft is selected. The collar is implanted in the left ventricular outflow tract to stabilize the aortic annulus. The distal tubular graft is cut 1-2 cm above the skirt. If the commissures do not reach the level of the graft sinotubular junction, three horizontal U stitches are passed at the top of each commissure, then from the inside to the outside at the desired height in the skirt and again from the outside to the inside at the top of the graft (Fig. 1A). Knotting the three stitches the free margin of the tubular prosthesis is lowered at the level of the commissures creating a new sinotubular junction on the skirt (Fig. 1B). The double layer at this level creates a little reduction of the diameter of the sinotubular junction as in a normal aortic root. The remnant of the tubular graft can be utilized to replace the aneurysmatic ascending aorta.

Case 1. A 47-year-old woman with Marfan’s syndrome suffering from ascending aorta aneurysm with normal aortic valve and severe mitral regurgitation caused by annular dilatation and prolapse of both leaflets was operated on using this artefact. In addition an Alfieri mitral valve repair was carried out. Case 2. A 60-year-old man with aneurysm of the aortic root associated with aortic valve regurgitation caused by the sinotubular junction dilatation and prolapse of the non-coronary leaflet underwent aortic root reimplantation with the same technique. The prolapsing leaflet was repaired by central plication and free margin reinforcement. Postoperative echocardiography showed no aortic regurgitation in both cases. The postoperative Magnetic Resonance image showed: in the oblique sagittal plane the bulging of the pseudo-sinuses and the normal morphologic appearance of the new sinotubular junction (Fig. 2A); in the oblique axial plane, the clover shape of the sinuses proves the compliant nature of the new root (Fig. 2B); although a flow analysis has
3. Discussion

The reimplantation type of aortic valve-sparing operation is the preferred alternative to the Bentall procedure when the aortic valve leaflets are normal [2-7]. Many modifications to the 'David I' original work have been proposed to create pseudosinuses with the aim to increase longterm durability of the aortic valve [3-7]. The use of the Valsalva graft introduced by De Paulis and colleagues, appear to be an attractive possibility because the prefashioned compliant neosinuses mimic the normal root physiology. The major drawback for a more widespread use of this graft is the predetermined height of the skirt [6]. In most cases in fact, the height of the valve remnants are shorter than that of the skirted section of the graft [7]; because the commissures must be implanted on the new sinotubular junction, De Paulis suggests to trim the graft collar to a minimum or reimplant the valve in the skirt to allow the commissural posts to meet the sinotubular junction [7,8]. We propose a simple technique to create a new sinotubular junction at the desired level in the skirt of the Valsalva graft. We believe that the proposed method provides a greater flexibility to the De Paulis prosthesis allowing a secure stabilization of the aortic annulus even when the patients' sinuses are shorter than the skirt.

References