

Our 7-Year Experience Supporting the Ross Autograft with the Novel Technique of the Personalised External Aortic Root Support

Background

Ross operation is the preferred option for aortic valve replacement in children, and evidence shows its excellent results in terms of haemodynamics and durability. However, indications are still limited due to the fact that it is a technically demanding procedure, only performed by specialized surgeons. On top of that, and despite numerous techniques have been described, we still haven't been able to overcome its main disadvantage: the autograft dilatation leading to graft failure. On the other hand, the Personalised External Aortic Root Support (PEARS) has proven to be a safe and effective option to prevent aortic root dilatation in all sort of aortopathy scenarios.

Methods

During the past 7 years we have used the PEARS graft, manufactured from the patients' pulmonary artery measurements from CT scan, to support the pulmonary autograft in the Ross operation. This graft is implanted at the same time as the autograft implantation. We have reviewed all the patients who underwent this technique, including demographic data, aorta measurements, operative data, and follow-up assessment consisting of periodic echocardiograms and MRI scans.

Results

46 patients were included in the study. Mean age at the time of the operation was 29.3, being the youngest patient 9 years-old. 15 patients (32.6%) had previous sternotomies, having 8 of them had a previous aortic valve replacement. 35 patients (76.1%) had initially a bicuspid aortic valve. Mean diameter of ascending aorta was 3.92 cm. 21 patients (45.65%) required a concomitant reduction aortoplasty due to mismatch sizes between the ascending aorta and the autograft. Mean bypass and cross-clamp times were 202.8 and 150 minutes respectively. Median length of stay was 6 days. Mean follow up was 17.9 months. Two patients required subsequent aortic valve replacement (one had rheumatic valve disease and the other had iatrogenic damage in his autograft valve leaflet). Ascending aorta dimensions remain stable when compared to immediate postoperative studies. There were no deaths

Conclusions

PEARS graft has proven to be an excellent support in the Ross operation to prevent the autograft failure, which can offer several advantages compared to other techniques described in the past. With this type of support, we believe the Ross indications can be expanded to multiple clinical scenarios, given the good long-term results this operation offers in terms of durability, life expectancy and haemodynamics

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