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Custom made external aortic root support, an alternative for aortic root replacement in patients with Marfan

Rega F. (1), Gewillig M. (1), Budts W. (1), Troost E. (1), Dymarkowski S. (1), Pepper J. (2), Treasure T. (2), Meyns B. (1)
(1) Paediatric Cardiology and Cardiac Surgery, University Hospitals Leuven, Leuven, Belgium
(2) Cardiac Surgery, Royal Brompton Hospital, London, UK

Introduction: Classical repair for aortic root dilatation in patients with Marfan disease involves major surgery. Anticoagulation is needed when the valve is replaced and if the valve is preserved a substantial risk of valve failure exists.
Methods: We report on two successful implants with a custom made external aortic root (AR) support device (Exstent, Ltd) thereby avoiding these substantial disadvantages.
Results: Our first patient is a 19 year old girl with Marfan's syndrome. Her AR dimensions on echo-cardiography increased from 31 mm in 2000 to 45 mm in 2010 (CT: 42 mm). In our second Marfan patient (male, 22 yrs), echocardiographic AR dimensions increased from 35 mm in 2006 to 40 mm in 2010 (CT: 45 mm). By computer-aided design, a model of the individual patient's aorta was created from cardiac CT images and an external AR support device was manufactured.
Both patients were operated in March 2011 using a midline sternotomy. The AR was dissected towards the annulus, thereby freeing the ostia of the coronaries and this without using cardiopulmonary bypass. The custom made woven graft was placed around the AR and secured. Both procedures were finished within two hours with minimal blood loss. Patients were discharged after 7 days and 8 days respectively. A control MRI after six months revealed unchanged dimensions of the AR (42 mm and 46 mm respectively).
Conclusion: External AR support is a possible alternative for AR replacement in Marfan patients. The procedure involves a sternotomy but avoids the use of cardio-pulmonary bypass. The aortic valve and the endothelium remain intact thereby avoiding the need for anticoagulation therapy. MRI after 6 months revealed unchanged dimensions of the AR.