Our experience on Personalised External Aortic Root Support (PEARS) application to paediatric population

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Objectives

The PEARS technique, has been safely used in over 500 patients worldwide. The original concept was to stabilize dilatational aortopathy in Marfans syndrome, and with its proven efficacy its use has been expanded to other aortopathies. Here we report our unique experience in the paediatric age group.

Methods

We have reviewed our single institutional results in the application of PEARS in patients aged 18 years old and younger. We review the baseline diagnosis, aorta dimensions, intraoperative data, and short-term morbidity.

Results

21 patients in the paediatric cohort have undergone PEARS procedure since 2012. Mean age was 15.28 years (range 9 to 18). Most patients (42.85%) had Marfan's Syndrome with aortic root dilatation (mean diameter 4.25 cm). Other diagnosis included bicuspid aortic valve aortopathy (n=5), DORV (n=2), interrupted aortic arch and post dilated Free root Ross (n=2), dysplastic aortic valve having paediatric Free Root Ross PEARS (n=2) and TGA (n=1). 7 patients had previous sternotomies. 5 had a reduction aortoplasty before PEARS application. 10 had their surgery done off bypass. Mean postoperative maximum aorta diameter was 3.4 cm. Mean reduction in aortic diameter post-PEARS application was - 0.87 cm. Follow-up imaging consisted of echocardiogram, MRI or CT-scans, showing stable diameters. One patient had to be reopened for pericardial effusion, while another one had to be re-operated three years later for severe aortic regurgitation which had been corrected during the PEARS post delayed arterial switch.

Conclusions

PEARS is an effective procedure in the paediatric Marfan's syndrome patients and even other complex congenital conditions developing aortic dilatation.

We have proven PEARS to be a safe procedure providing stable aortic dimensions and non-interference with the aortic valve in the paediatric population.

An interesting subset has shown reversal of aortic insufficiency with PEARS application that reduces the aortic dimensions.