GROWTH AND FUNCTION OF A NOVEL BIO-ENGINEERED TRICUSPID VALVE IN A GROWING OVINE MODEL: RESULTS FROM A PRE-CLINICAL STUDY

Poster Contributions

Hall C

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Authors: Farhan Zafar, Ryan Moore, Robert Hinton, Richard S. Baker, Roosevelt Bryant, Nanitaka Kimura, Michael Taylor, David Morales, Cincinnati Children’s Hospital, Cincinnati, OH, USA

Background: Valve replacement options in children lack the ability to grow with the patient and therefore require multiple reoperations. Small intestinal submucosa derived extracellular matrix (SIS-ECM) remodels into surrounding tissues and has been used successfully as a patch in a variety of tissues including artery and myocardium. A complete valve bioprosthesis made of SIS-ECM is hypothesized to remodel into native valve tissue and function and grow similar to a native valve. The objective of this study is to evaluate growth, structure and function of implanted SIS-ECM tricuspid valve (TV) in a growing ovine model.

Methods: Nine lambs [median weight 18 (17-23) kg] are included; 7 with SIS-ECM TV placement and 2 age-matched controls with native valves (NV). Each lamb underwent echocardiogram at similar intervals to measure the valve annulus dimension and right ventricular (RV) function.

Results: The SIS-ECM TV demonstrated physiologic growth as evidenced by an incremental increase in annular diameter similar to NV [3.0 vs 3.5 mm; p = 0.5] [Figure 1]. All lambs (TV and NV) had stable trivial to mild regurgitation except one TV had moderate to severe regurgitation due to papillary detachment with a flail leaflet. All TV had full mobility without stenosis and RV systolic function was normal at follow-up.

Conclusions: SIS-ECM TV bioprostheses demonstrate normal growth with preserved valve function at 3 months. The SIS-ECM may provide a unique solution for valve replacement in infants and small children.