

Design and Development of a Bi-Leaflet Pulmonary Valve

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Abstract : Paediatric patients who require ventricular outflow tract reconstruction usually need valve construction to prevent valvular regurgitation. They would face problems like lack of suitable, affordable conduits and the need to undergo several operations in their lifetime due to the short lifespan of existing valves. Their natural growth and development are also of concern, even if they manage to receive suitable conduits. Current prosthesis including homografts, bioprosthetic valves, mechanical valves, and bovine jugular veins either do not have the long-term durability or the ability to adapt to the growth of such patients. We have developed a new design of bi-leaflet valve. This new technique accommodates patients' annular size growth while maintaining valvular patency. A mock circulatory system was set up to assess the hemodynamic performance of the bi-leaflet pulmonary valve. It was found that the percentage regurgitation was acceptable and thus, validates this novel concept.

Keywords : bi-leaflet pulmonary valve, pulmonary heart valve, tetralogy of fallot, mock circulatory system

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