

## Percutaneous Pulmonary Valve Implantation: 5 Years of Follow Up

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### **Background:**

Percutaneous pulmonary valve implantation (PPVI) is a safe, less invasive alternative to surgical valve replacement for the congenital heart disease patient with right ventricular outflow tract dysfunction. The aim of this study was to determine if reverse right ventricular (RV) remodeling following PPVI is persistent in the longer term and whether timing of PPVI influences outcomes.

### **Methods:**

Consecutive patients from the pediatric and adult congenital heart disease programs were enrolled. Cardiac magnetic resonance imaging, echocardiography, metabolic exercise testing and hemodynamics prior to intervention were compared to repeat measures at follow up, using paired t tests and linear regression models assessing changes over time.

### **Results:**

Fifty-one patients were followed for a mean  $4.5 \pm 1.9$  (range 0.9-6.9 years) after implantation, including 31 children with a mean age of  $14.2 \pm 2.1$  years and 20 adults mean age  $29.5 \pm 12.3$  years at time of implantation. Freedom from surgery was 90% at 5 years and from re-intervention 87% and 68% at 3 and 5 years. Freedom from re-intervention was 100% at two years for all patients since 2008. Younger age at implantation was associated with an increase of  $4.17 \pm 1.29\%$ /10 years of age in echocardiographic LV ejection fraction ( $p=0.001$ ),  $0.23 \pm 0.10$  points (on a 3-point scale) per 10 years in qualitative RV function ( $p=0.03$ ),  $2.68 \pm 0.90$  ml/kg/min per 10 years in max  $\text{VO}_2$  ( $p=0.003$ ) and a decrease of  $0.81 \pm 0.19$  cm per decade in RVED ( $p<0.001$ ). Improved RV function before PPVI was associated with an increase of  $5.8 \pm 0.8\%$ /10% in MRI RVEF ( $P<0.001$ ) and  $3.3 \pm 0.5\%$ /10% in LVEF ( $P<0.001$ ) post-procedure, and superior LV function pre-procedure was associated with an improvement of  $6.2 \pm 1.5\%$ /10% in RVEF ( $P<0.001$ ) and  $4.8 \pm 0.8\%$ /10% in LVEF ( $P<0.001$ ).

### **Conclusions:**

PPVI in younger patients with preserved ventricular function has improved functional outcome. Strategies to preserve right ventricular function may include earlier timing of PPVI in this population.