Right ventricular outflow tract reconstruction with decellularized porcine xenografts in patients with congenital heart disease

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Background and aim of the Study
Decellularized xenogeneic pulmonary valves have been introduced for right ventricular outflow tract (RVOT) reconstruction in congenital heart disease. In the present study, the intermediate-term results from three institutions were analyzed.

Methods
Between January 2006 and September 2008, a total of 61 patients (median age 7 years; range: 9 days to 50 years; median body weight 21 kg; range: 1.9-140 kg) underwent RVOT reconstruction with either the Matrix P (n = 9) or Matrix P Plus (n = 52) tissue-engineered conduit. Eighteen patients underwent surgery in infancy, and 31 patients had previously undergone one or more RVOT interventions or operations.

Results
The valve sizes ranged from 11 to 27mm. Five patients died during the hospital stay or within three months, from non-valve-related causes; hence, the early mortality was 8.2%. No deaths occurred during the follow up period. Reoperation due to valve failure became necessary in four patients; three patients underwent RVOT interventions due to distal anastomotic stenosis, and six reinterventions were performed distal to the valve due to hypoplastic branch pulmonary arteries. Patients with valve implantation during infancy showed a composite freedom from valve-related reoperation, catheter intervention or valve dysfunction (defined as dP(max) > 40 mmHg) of 87% at one and three years postoperatively. Both, computed tomography and magnetic resonance imaging studies demonstrated normal structural features, with no evidence of calcification.

Conclusion
The Matrix P/Matrix Plus conduit represents a viable alternative for RVOT reconstruction in patients with congenital heart disease. The intermediate-term performance of the conduits was favorable compared to that of other currently available implants.

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