

Systemic Atrioventricular Valve Replacement by mechanical prosthesis in Children: Evolution in Practice and Predictors of Long-Term Outcome

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Introduction. Systemic atrioventricular mechanical valve replacement (SAVR) in children, especially children aged < 5 years, has been associated with a high complication rate and long-term outcome is generally perceived as poor because of mandatory anticoagulation and fixed size prosthesis.

Methods. A retrospective review of clinical and surgical records of patients undergoing SAVR in Necker hospital between 2000 and 2017, was performed. 94 children underwent 108 SAVR procedures at a median age of 4.2 years (range, 1 month to 17 years) and a median weight of 15 kg (range, 2.5 to 68 kg). 25 patients (27%) were < 1-year-old. Fifteen patients (16%) had more than one SAVR. Median follow-up for operative survivors was 5.8 years (range, 1 month to 18 years, 96% complete).

Results. Thirty-day mortality was 9% (n = 8). One-year, five-year and ten-year patient survival was respectively 87%, 82% and 79%. By multivariate analysis, high operative mortality in the younger children < 1-year-old with Shone's syndrome was the most important contributor to poor long-term survival (p = 0.03). Among survivors, the 10-year freedom from reoperation was 68%. 5-year survival substantially increases in the second period of the study (72% before 2008 vs 89% after 2008, p = 0.03) irrespective of age and disease aetiology. From 2008, age-adjusted variable predictors of death that changed were: the median valve size (23 mm vs 17mm, p = 0.007), the shape of prosthesis (28% inversed aortic prosthesis vs 3%, p = 0.007) and the prosthesis position (28% in the supra-annular position vs 54%, p = 0.017). Complications after SAVR included heart block requiring pacemaker (13%) with a higher risk in case of atrioventricular canal (p = 0.004), bleeding (8%), prosthesis thrombosis (3%), stroke (3%) and endocarditis (4%).

Conclusions. Early mortality after SAVR is low and decreases from 2008 thanks to operative technic modifications. Complications associated with surgery and long-term anticoagulation are rare. This study gives confidence in mechanical prosthesis especially when they are performed in children aged > 1 year.