Outcome of the Ross procedure in 100 Children and Adults: Low mortality, excellent survival but frequent reinterventions during mid-term follow-up

Division of Cardiology, University Children's Hospital Zurich, Switzerland (1), Cardiovascular Center Zurich, Klinik Im Park, Zurich, Switzerland (2), Division of Cardiovascular Surgery, University Children’s Hospital Zurich, Switzerland (3), Division of Cardiology, University Hospital of Zurich, Switzerland (4), Division of Biostatistics, University of Zurich, Switzerland (5).

Background. Ross procedure (RPR) offers excellent hemodynamic and clinical outcome but questionable long-term durability. There are little data on long-term outcome and predictors of reintervention after this procedure.

Methods. Between 1993 and January 2011 (89 interventions after Jan 1, 2000), 100 children and adults (76 males; mean age 17±12 years) underwent a RPR consisting in a root replacement at our center. In all patients (pts), pre- and postoperative clinical and echocardiographic data were analyzed as well as surgery reports, and mid-term follow-up (survival, NYHA class, frequency of reinterventions or endocarditis).

Results. Aortic valve (AV) pathology leading to RPR were congenital heart disease (including 64 bicuspid AV, 12 monocusp AV, 12 tricuspid, 3 quadricuspid, 9 indeterminate); a history of prior endocarditis (6 pts) and rheumatic heart disease (2 pts). 52 pts had previous cardiac interventions, including coarctation surgery (5 pts).

RVOT replacement was made with a pulmonary homograft (66 pts) or a Contegra graft (31 pts) in most. Procedures included reduction surgery of the ascending aorta (19 pts), and resection of subaortic stenosis/myectomy (9 pts).

Perioperative mortality was 1%; one 8 year old pt with postoperative stroke died 3 weeks postoperatively of ventricular fibrillation.

Mid-term follow-up was available in 97 pts (98%) after 5.6±3.8 years. 94 of 95 pt were in NYHA class I or II. Any dilatation of the aortic root or ascending aorta (Z score>4) was observed in 32 of 94 pts (34%). Postoperative endocarditis occurred in 2 pts (1x Contegra graft, 1x autograft). Reinterventions were necessary in 23 pts (24%): most frequently valvuloplasty of the RVOT (7 pts), percutaneous pulmonary valve replacement (6), aortic root procedures (3) and homograft replacement (3 pts). Death occurred in 2 pts (heart failure in both). 5 year freedom from reintervention was 83.8±4.5%.

Conclusion. Ross procedure in pts with predominantly congenital aortic valve disease has low morbidity and mortality. Mid-term follow-up shows an excellent functional class, however, besides aortic dilatation (34%) also reinterventions are frequent (24%) especially in the RVOT. This necessitates regular postoperative surveillance after RPR.