

Long-term outcomes after Ross procedure in different age groups: a single - institution experience

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Objective: To evaluate long-term outcomes after Ross procedure.

Patients and Methods: All consecutive patients (n=231), operated between 1996 and 2017 at our institution, were analyzed. Among them, neonates and infants were 16 (6,9%). The mean age was 145 ± 101 (2-648) months, mean weight - $40\pm 22,9$ (3.3-119)kg. Aortic stenosis - 111 (48%) patients, aortic insufficiency - 95 (42%) and combined lesion - 25 (10%). Aortic root reinforcement was used in 123 (53%) patients, Ross-Konno procedure in 25 (10,8%). Right ventricle-pulmonary artery (RV-PA) connection was created by prosthetic trileaflets conduits in 125 (54%), homografts – 11 (5%), xenografts – 32 (14%), RV-PA autologous tissue - 63 (27%). Long-term follow-up was 132 ± 67 (6-252) months. Regression and correlation analysis was used to assess the results.

Results: Long-term outcomes followed in 204 (95%) patients. Overall mortality was 9,5% (n=22), hospital mortality was 6,9% (n=16) and late – 2,6% (n=6). During the follow-up, reoperations required 11 (5,1%) patients on the pulmonary autograft (4 repairs and 7 replacements), 35 (16,2%) on the RV-PA conduit (4 plasty and 31 replacement). Transcatheter procedures were performed in 40 (18,6%) patients. Independent predictors of autograft reoperation were older age ($r = 0,01$, $p = 0,033$) and preoperative aortic regurgitation ($r = 0,1$, $p = 0,04$). Independent predictors of autograft regurgitation were older age of patients at the time of surgery ($r = 0,277$, $p = 0,003$), acquired AV lesion (rheumatic disease ($r = 0,252$, $p = 0,001$), infective endocarditis ($r = 0,314$, $p = 0,006$), EDI $LV > 100\text{ml/m}^2$ before surgery ($r = 0,477$, $p = 0,001$). Factors which decrease risks of autograft disfunctions and reoperations are aortic root reinforcement ($r = -0,287$, $p = 0,002$), congenital aortic valve lesion ($r = -0,405$, $p = 0,001$), bicuspid aortic valve ($r = -0,351$, $p = 0,001$). Independent predictors of RV-PA reoperation were younger age ($r = -0,174$, $p = 0,03$) and small conduit size ($r = -0,38$, $p = 0,001$).

Conclusions: Ross procedure is an operation with low mortality and good long-term follow-up results. Reoperations on pulmonary autograft were rare in our patients. RV-PA conduit require more reoperations and it is important to continue further study.