The Ross operation - a feasible and safe option in the setting of a bicuspid aortic valve?

Abstract:

The Ross operation in the setting of a bicuspid aortic valve (BAV) remains controversial. Using data from the German Ross Registry, we sought to investigate the effect of the presence of a BAV on autograft function and diameters over time after the Ross operation compared with the presence of a tricuspid aortic valve (TAV). A total of 1277 patients (mean age 42.2 ± 15.3 years) with intra-operatively documented aortic valve morphology during the Ross operation were analysed in the present study (sub-coronary technique, n=648, root replacement technique, n=629 patients). A BAV was present in 70.9% of patients. Clinical and echocardiographic follow-up was performed preoperatively and at pre-specified intervals (mean follow-up 5.7 ± 3.8 years, 6806 patient-years). Hierarchical multilevel modelling techniques were used for the statistical analysis of serial measurements and comparisons among groups. Initial neo-aortic regurgitation was lower in the BAV group (0.52 vs 0.62 aortic insufficiency (AI) grades, p=0.008), whereas the annual increase of it did not differ among groups. In both surgical techniques, no significant development of neo-aortic regurgitation (<0.02 AI grades per year) could be detected. Initial aortic annulus and sinus dimensions did not differ in the presence of a BAV. However, BAV patients developed a
higher degree of annulus and sinus dilatation over time (0.20 mm per year vs 0.06 mm per year, 
p=0.003; 0.24 vs 0.11 mm per year, p=0.013). This effect persisted when allowing for the two different 
surgical techniques. Baseline sinotubular junction (STJ) diameters did not differ among groups and 
annual increase thereof was similar (29.15 mm vs 28.9 mm, p=0.69; 0.44 mm vs 0.35 mm, 
p=0.15). For the observed time period, postoperative neo-aortic regurgitation after the Ross procedure 
did not differ between patients with a BAV or a TAV. Root dimensions, although clinically not relevant, 
increased in both valve entities supporting surgical reinforcement strategies. We cannot consider a 
BAV as a contraindication for the Ross operation.