Long-term outcomes and risk factors for reoperation after subaortic stenosis resection in children and adults

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**Background:** Sub-valvular aortic stenosis (SAS) is an extremely heterogeneous form of left ventricular outflow tract (LVOT) obstruction, which can lead to aortic valve damage. Although corrective surgery is considered the most effective treatment, rates of recurrence and reoperation are still high. Previous studies have focused on predictors of reoperation in several subgroups of patients with SAS, but rarely in the whole population of patients with SAS.

**Purpose:** We sought to describe long-term outcomes after SAS resection and to determine the predictors of reoperation after successful primary resection.

**Methods:** We retrospectively reviewed the records of patients who underwent SAS resection between 1994 and 2021 at our institution with at least 12 months’ follow-up. Patients with a single-ventricle physiology and idiopathic hypertrophic cardiomyopathy were excluded. Demographic, surgical and echocardiographic data were analyzed. Outcomes were reoperation after successful primary resection, death and morbidities, including postoperative complete heart block and aortic regurgitation (AR) grade at latest follow-up.

**Results:** Seventy-six patients (paediatric, n = 72 and adult, n = 4) who underwent SAS resection were included in the analysis. Median length of postoperative follow-up was 11.1 years (IQR range: 7.3 – 15.7 years), with two late deaths. Reoperation due to recurrent obstruction or severe AR occurred in 24 patients (31.6%). Median time to reoperation was 7.5 years (IQR range: 3.6 – 11 years). Overall freedom from reoperation at 5 years and 10 years was 84.6% and 69.1% respectively. Gender and association with other cardiac defects did not differ significantly between those with reoperation and those without. In multivariate analysis, independent predictors of reoperation were age at first surgery younger than 5 years (HR 3.54, 95% CI 1.06 – 11.83; P = 0.040) and tunnel-type lesions (HR 4.42, 95% CI 1.70 – 11.51; P = 0.002). Three patients (3.9%) had complete heart block and required placement of an implantable pacemaker. Following SAS resection, progression of AR was common (39/68, 57.3%) but only 5 patients (7.3%) developed sufficient regurgitation to require surgical repair or replacement.

**Conclusions:** Reoperation is not infrequent after surgical relief of SAS and reaches a plateau after 10 years. Younger age at first surgery and tunnel-type SAS independently predict reoperation. Progression of AR after corrective surgery of SAS is common, but fortunately only a minority of patients develop hemodynamically significant AR requiring reintervention.