Recovery of the left ventricle and mitral valve function long after repair of anomalous origin of left coronary artery from pulmonary artery

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Background: the aim of this study is to evaluate long term results after surgical repair of anomalous origin of left coronary artery from pulmonary artery (ALCAPA) in children. We focused on the function of both left ventricle and mitral valve.

Methods: medical files of patients operated for ALCAPA for twenty seven years period (1987-2014) were retrospectively analyzed. Echocardiography measurements of left ventricle (LV) and mitral valve (MV) function preoperatively, at discharge, at 3 and 12 months after operation and at last visit were collected. The results in two groups – survivals and nonsurvivals were analyzed and compared. Data are presented as medians with range or means ± standard deviation. A parametric paired samples T-test integrated in the statistical software SPSS v.19 was used. A value of $p \leq 0.05$ was considered significant.

Results: for a period of 27 years 26 children underwent surgery for ALCAPA. Median age at surgery was 5.5 months (range 0-111 months). All patients underwent establishment of a two-coronary circulation by direct reimplantation (n=16) or by intrapulmonary tunnel technique (n=10), with concomitant mitral valve repair in two cases. 6 patients died. The age of nonsurvivors was lower than survivors: 3.5 (2-6) versus 9 (0-111) months, $p=0.05$. All nonsurvivors had moderate or severe mitral regurgitation (MR) preoperatively and higher LV diastolic diameter (LVDD) z score than survivors: 11.3 (9-14.6) versus 6 (1.9-13.1), $p=0.003$. Median follow up was 79 months (4-178). At last follow up, all survivors were asymptomatic with LVDD z-score near normal: 0.3 (0-2.4) versus 6.8 (1.9-14.6) preoperatively $p=0.001$; and normal LV EF: 66 % (61-78) versus 40.5 % (16-70) $p=0.001$. 22 patients had moderate or severe mitral regurgitation at initial presentation and it eventually regressed to non significant in all survivors $p=0.001$. No subsequent interventions on the coronary arteries or mitral valve were needed.

Conclusion: in our institution operative treatment of ALCAPA with establishment of two coronary circulation without MV repair leads to normalization of LV dimentions and systolic function and improvement of MR in surviving patients. Mortality is related to low age and associated higher degree of LV dysfunction.