

Surgical treatment of a neonate with congenital left main coronary artery atresia

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Background: Left main coronary artery atresia (LMCAA) is a rare congenital malformation with nonspecific and varied clinical presentation. Ventricular dysfunction and mitral insufficiency are expected ischemic consequences in the neonatal period. Left internal mammary artery (LIMA) bypass graft is uncommon due to technical difficulties in performing this procedure in neonates. We describe LMCAA revascularization with LIMA graft and mitral valve repair in a 7-week-old neonate with successful outcome one-year postoperatively.

Methods: Cardiopulmonary bypass was initiated in bicaval fashion for revascularization and mitral valve (MV) repair. Moderate hypothermia (28°C) was induced with cold cardioplegic solution infused antegradely. The LIMA was harvested as a pedicle graft and wrapped in dilute papaverine solution. It was prepared and anastomosed to the LAD in its midportion using interrupted 8-0 Prolene sutures. On release of the soft clip on the LIMA, a good flush was observed in the LMCA and bulging vasculature of the LAD. Severe regurgitation was visualized through the atrial septum between the anterior leaflets and cleft in the posterior leaflet between the P2 and P3 elements on inspection of the MV. The repair consisted of closing the cleft between P2 and P3 with 6-0 Prolene sutures and supporting the posterior commissural with 5-0 Prolene two-layered annuloplasty suture. On static testing the valve was competent. Initially the MV was intact, but gradually symptomatic MR returned. At reoperation 4 weeks later, the MV was repaired without complication. The graft was controlled during cardioplegia with a soft vascular clip. Bypass details were the same as the first operation. The previous repair was intact, however, further distortion had occurred in the intervening time due to fibrosis with thickened and rolled edges of both anterior and posterior leaflets. There was chordal elongation of the P2 segment of the posterior leaflet with infarcted papillary muscles beyond this and chordal elongation of the A2 segment of the anterior leaflet with billowing in the mid-portion. The chord supporting the posterior leaflet was shortened and the P2 segment was plicated creating a shortened leaflet with no prolapse. The previous annuloplasty sutures were removed and both commissures were supported with 5-0 Prolene annuloplasty sutures.

Results: One-year following the initial procedure, elective cardiac catheterization angiograms showed a patent LIMA graft, complete filling of the LAD, and retrograde filling into the LMCA and circumflex. The pulmonary artery (PA) bifurcation had no abnormalities Qp:Qs ratio was 1:1 with no step-up in PA saturation. Left ventricle function was excellent, with only mild MR.

Conclusion: A LIMA graft for LMCAA seems to be a reasonable early interventional approach with excellent outcomes at 1-year postoperatively.