

## **Unusual coarctation repair with double lumen distal arch**

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A 18-year old male with neonatal repair of pre-ductal coarctation of the aorta presented with increasing shortness of breath. Cardiovascular magnetic resonance showed a double lumen aorta in the region of the coarctation, extending from the distal aortic arch to the pulmonary artery level (Panel A, in-plane flow panel B). The left subclavian artery is absent. The inner lumen (1) measures 8mm in diameter, the outer lumen (2) 11mm (Panel A,C). Flow to the descending aorta was near normal at 60% of the total cardiac output (normal is  $\sim 2/3$  of cardiac output), with  $1/3$  of the flow passing through the inner lumen and  $2/3$  through the outer one. Peak velocities were also reasonable: 2.1m/s in the smaller (inner) and 1.8m/s in the larger (outer) vessel.

Review of the medical notes revealed that the original coarctation involved a relatively long segment for a neonate (1.2cm) with severe hypoplasia (0.13cm diameter). The surgical approach had therefore been modified from standard, with creation of an unusual double lumen repair by transecting the left subclavian artery at the thoracic inlet and bringing it down to the descending aorta beyond the coarctation and establishing aortic continuity (Panel D+E, diagram of aorta before and after repair, redrawn from surgeon's sketch). The original coarctation segment appears to have grown from that time and now contributes significantly to the descending aortic flow. More common approaches to coarctation repair include end-to-end anastomosis, interpositional graft, subclavian flap insertion into the existing aorta, and patch angioplasty.