Commentary: New look at an old operation

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Kobayashi and colleagues from Okayama, Japan, have reviewed their results with selective pulmonary artery banding for neonates and infants with complete atrioventricular septal defects (CAVSDs) over more than 2 decades. Comparing staged repair with primary repair, the staged group had equivalent survival and reoperation rates but better long-term left atrioventricular (AV) valve competence. The infants in the staged repair group were significantly smaller and younger at the time of their initial procedure; hence, they were actually at greater risk for postoperative complications.

Pulmonary artery banding is an “old” operation. It is quite interesting to look at the conclusion from the University of Minnesota group from 1979. They concluded that “pulmonary artery banding is an effective palliative procedure for infants with complete AV canal and congestive heart failure.” This is essentially the same conclusion reached by the group from Okayama in the current era!

In the 40 years between these 2 reports, the trend has been to perform earlier primary repair of CAVSD. Perhaps it is time to take a step back and acknowledge the usefulness of pulmonary artery banding in a subset of smaller infants. The integrity of AV-valve tissue in neonates and tiny infants can be quite friable. This can make valve reconstruction problematic, resulting in difficult-to-manage left AV-valve insufficiency in a small baby. I am sure that most of us would rather operate on a child with a CAVSD when they are 6.8 kg (weight at complete repair in this cohort) rather than when they are 2.9 kg (weight at pulmonary artery banding in this cohort).

In a recent review of pulmonary artery banding for CAVSD by Devlin and associates from the Congenital Heart Surgeons’ Society, similar results were noted. In that multi-institutional analysis, 50 of 474 (11%) infants with CAVSD underwent staged repair with previous pulmonary artery banding (median age, 1.1 months). Survival at 4 years was equivalent to patients who underwent primary repair along with freedom from AV-valve reoperation and pacemaker requirement. In particular for the subgroup of patients with coarctation of the aorta along with CAVSD, a staged approach with neonatal coarctation repair and pulmonary artery banding is associated with improved survival and lower morbidity.

Two of the reasons the pulmonary artery banding results are so good from the Okayama group are the timing of the procedure and their attention to detail with the technique. The operation is best performed after a drop in pulmonary vascular resistance but before there is annular dilatation of the AV valve secondary to volume overload. The operative age of 37 days for banding may be the “sweet spot” for preparing these patients. In addition, performing the operation through a median sternotomy, with very precise calibration of the band using multiple strategies (as they carefully outlined) for assessing the tightness of the band, has resulted in excellent results.

One aspect of their strategy that surprised me was that the mean duration from band to intracardiac repair was 342 days, nearly 1 year. Although this feels rather long, it did not appear to adversely affect the function of the left AV valve, or the ability to rehabilitate the main pulmonary artery.
artery after the band was removed. Given the results the group from Okayama has presented, along with the results of the recent Congenital Heart Surgeons’ Society review, it is clearly time to take a long, careful, “new look” at an “old” operation.

References