

Common origin of the innominate and left carotid artery in prenatally suspected coarctation of the aorta

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Objective: In neonates with prenatal suspicion of coarctation of the aorta, we have noted a frequent occurrence of common origin of the innominate artery and left common carotid artery (LCCA). Our aim was to establish whether branching pattern influenced the diameter of the distal aortic arch.

Methods: The last 37 cases of prenatally suspected coarctation diagnosed at our institution were reviewed. Neonatal echocardiograms performed within 24 hours of birth were analysed. For the purposes of this study, common origin included neonates with a true common origin and those with less than 1 millimetre between the origins of the innominate artery and LCCA. The arch diameter immediately distal to the LCCA, arch diameter proximal to the left subclavian artery (LSCA) and isthmus at end-systole were measured. Measurements were taken blinded to the outcome. Student's t test, Fisher's exact test and one-way ANOVA were used for analyses.

Results: 14/37 neonates developed neonatal coarctation requiring surgical repair. Common origin occurred in 6/14 (43%) of those neonates who developed coarctation and 13/23 (57%) of those who did not develop coarctation (p=0.508). Neonatal weight was not significantly different amongst these four groups (p=0.811)

With a normal branching pattern the pre-LSCA arch diameter was wider compared to the pre-LSCA arch diameter in neonates with common origin (mean±SD: 4.5mm±0.8; 3.3mm±0.8; p=0.003). Figure 1 shows the distribution of pre-LSCA diameters.

The neonates with common origin who did not develop coarctation had similar arch diameters to those with a normal branching pattern who did develop coarctation: post-LCCA arch diameter (p=0.347), pre-LSCA diameter (p=0.331) and isthmus (p=0.117).

In those neonates who do not develop coarctation, the post-LCCA diameter, pre-LSCA diameter and isthmus are significantly smaller in common origin compared to normal origin (p=0.002, p=0.030, p=0.012, respectively).

Conclusions: In neonates with common origin and no coarctation, the arch measurements were a similar size to those neonates with normal branching pattern with coarctation. Common origin may be a reason for the high false positive rate of prenatal diagnosis. Therefore, we recommend ascertainment of the branching pattern of the aortic arch when disproportion of the transverse and ductal arches is seen in the fetus.

