Patients with prenatally diagnosed coarctation of the aorta may be at increased risk of re-coarctation

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Introduction:
Prenatal diagnosis of coarctation of the aorta (CoA) has improved by comparing the aortic and ductal arch sizes and flow disturbance in three-vessel and tracheal view. While antenatal diagnosis of CoA may improve perioperative survival, little is known regarding longer term morbidity of children detected prenatally.

We compared children with antenatal (A) and postnatal (P) diagnosis of CoA undergoing surgical repair. We hypothesized that detection of CoA prenatally selects patients with more complex aortic arch anatomy that are at increased risk for re-intervention following repair.

Methods:
Retrospective study of all patients undergoing surgical repair of CoA within the first year of life between 2003-2011. Patients were excluded if there were associated major cardiac abnormalities other than mild aortic stenosis, atrial or ventricular septal defect. All operative and medical records were assessed. Re-coarctation was defined as 20mmHg difference between upper and lower limb blood pressure and diastolic tail on echocardiography.

Results:
One-hundred-and-thirty-eight children met inclusion criteria, 48(34.8%) in group A. Twenty-seven(19.6%) had pulmonary-artery-banding. There were 7 deaths (5.1%). Group P had a higher risk of preoperative ventilation(p = 0.005), lower pH(p = 0.0024), older age at operation(p=0.0001) than group A. There was no statistical difference in mortality (p=0.67).

Predictors for mortality included associated aortic valve stenosis +/-ASD or VSD(HR 26.5, 95%CI 1.6 – 449.9, p=0.023), and pulmonary-artery-banding(HR 6.03, 95%CI 1.3-27.0, p=0.019).

Eighteen of 138(13.0%) required re-intervention for aortic arch obstruction. Univariable risk factors for re-intervention included prenatal diagnosis(HR 3.7, 95%CI 1.4-10.0, p=0.011), age at operation≤ 7 days(HR 3.9, 95%CI 1.4-11.1, p=0.011), subclavian flap procedure(HR 2.9, 95%CI 1.0-8.4, p=0.049) and male gender(HR 0.3, 95% CI 0.1-0.9, p=0.026). Multivariable analysis showed age at operations≤ 7 days(HR 2.6, 95%CI 0.8-8.8) and prenatal diagnosis(HR1.2 95%CI 0.7-7.0) had increased hazard ratio but were not statistically significant.

Conclusions:
Children with postnatal diagnosis of CoA have increased morbidity at initial presentation; however an antenatal diagnosis of CoA confers increased risk for surgical re-intervention which should be reflected in prenatal counseling. These findings may reflect the more successful antenatal detection of arches with long segment hypoplasia.