Growth of unrepaired hypoplastic proximal aortic arch and reintervention rate after aortic coarctation repair

Objective: To evaluate growth of unrepaired hypoplastic proximal aortic arch (PAA) after surgical repair for coarctation of the aorta (CoA) and tubular hypoplasia of the aortic arch (THAA). Reintervention rates due to aortic arch obstruction and diameters of the aorta were assessed.

Methods: Preoperative, postoperative and follow-up echocardiographic images at 3 and 7 years after operation of 140 patients who underwent repair for CoA from 2005 to 2012 were reviewed. Three patients (2 %) underwent end-to-side repair and 137 extended end-to-end repair (98 %). All 140 procedures were done via thoracotomy approach. Patients were divided into two groups based on the preoperative PAA z-scores: THAA was defined as z-score less than -3 and non-THAA group, z-score greater than or equal to -3.

Mortality and reintervention data were collected from patient records.

Results: Fifty-one (36 %) had THAA and 89 (64 %) had non-THAA. Survival was 94 % at 10 years and median (IQR) years to death was 1.49 (0.10 – 3.19) years. The overall reintervention rate at 10 years was 9 % in THAA and 17 % non-THAA group (p = 0.51). The catheter reintervention rate at 10 years was 2 % in THAA and 17 % non-THAA group (p = 0.029). The surgical reintervention rate at 10 years was 7 % in THAA and 0 % non-THAA group (p = 0.018). All patients who required surgical reintervention (3 for PAA obstruction and 1 for distal aortic arch obstruction) were in THAA group and 3 patients with PAA obstruction had preoperative PAA z-scores ?3.6, -4.2 and -4.3. Other patients in the THAA group did not have PAA obstruction. Indication for all catheter reinterventions was anastomotic restenosis/recoarctation in distal arch/descending aorta. Follow-up echocardiography showed PAA catch-up growth in the THAA group compared to the non-THAA group (pre-operative median z-score of -3.6 vs -2.3, and at 7 years follow-up of -1.1 vs. -1.2, p <0.001). There was no difference in size of the PAA between THAA non-THAA group (median z-score at 7 years follow-up of -1.1 vs. -1.2, p=0.93). At latest follow up 4 (8 %) patients in THAA group and 7 (8 %) in non-THAA group (p = 1.00) had elevated systolic blood pressure (> 90 percentile). One (2 %) in THAA and 5 (6 %) patients in non-THAA group (p = 0.41) were on antihypertensive medication.

Conclusions: Unrepaired PAA hypoplasia grows after CoA repair. Reintervention rates were comparable between groups but those with THAA had higher surgical reintervention rate.

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