

Endovascular stenting in transverse aortic arch hypoplasia

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Objectives

To describe the combined experience and outcomes from stenting transverse aortic arch hypoplasia.

Methods

Outcomes for transverse aortic arch hypoplasia stenting were collated from 4 centres between 2000 and 2010. Primary endpoints were reduction in instantaneous peak systolic catheter gradient, improvement in angiographic dimensions of the stented segment, and systolic right arm measured blood pressure. Changes in antihypertensive medication after stenting, early and late complications were recorded.

Results

21 patients (16 male, 5 female) were included. Median age was 16.5 years (0.25-25.9 years). Median weight was 55kg (4.5-103kg) and median height 162.5cm (54-182cm). 19 patients were hypertensive at baseline. There were only 2 neonates, both post repair of interruption where there was no other surgical option for the recoarctation.

Median diameter of the native transverse arch was 7mm, increasing to 14mm post-stenting ($p<0.0001$). Median ratio of the transverse arch to descending aorta at the diaphragm level improved from 0.43 to 0.9 ($p<0.001$). Mean baseline gradient across the hypoplastic transverse arch was 38.1mmHg (14-76mmHg). Mean post-stent gradient was 4.95 mmHg (0-13mmHg) $p<0.0001$.

There were early complications in 5 patients (1 stroke, 2 stent migrations, 1 puncture site bleeding requiring transfusion, and 1 transient arm neuropraxia), with no deaths.

Follow up

Follow up data was available for 19 patients; median follow up period 24 months (1-120 months). 15 patients had a follow up CT, and 3 had an MRI. One neonate had a stent fracture and intimal hyperplasia within the stent at 12 months. A second neonate had intimal hyperplasia of the stent requiring balloon dilation of the stent at 30 months.

17/19 patients had medium term follow-up data on non-invasive blood pressure and medication. Pre-stent median systolic blood pressure was 153mmHg (117 -180mmHg), with a post-stent systolic median of 130mmHg (105-150mmHg) $p=0.0002$. The baseline median diastolic blood pressure was 78mmHg (49-107mmHg), reducing to 70mmHg (50-90mmHg) post-stent ($p=0.006$). 13/17 patients showed a reduction in antihypertensive medication post-stent.

Conclusions

Stenting of transverse arch hypoplasia although technically challenging, produced good angiographic and haemodynamic results with an early improvement in blood pressure control. These results appear to be sustained in the medium term.