Carotid and Subclavian Aneurysms in Infants Following Neonatal Norwood Surgery: Report of Seven Cases.

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Introduction:
Following incidental finding of a left common carotid aneurysm during diagnostic cardiac catheterisation prior to cavopulmonary shunt surgery, we sought to investigate the occurrence of head and neck artery anomalies following neonatal Norwood surgery. As the only patient group to undergo both neonatal bypass surgery and routing advanced imaging of the aortic arch, those selected for this analysis were exclusively post-Norwood palliation.

Methods:
Retrospective data review for 80 sequential patients post Norwood surgery and diagnostic catheterisation at a single tertiary referral center (May 2010-March 2014).

Results:
Carotid or subclavian arterial abnormality was identified in seven patients (8.8%). See figure 1 for example angiography. In all patients the lesion was proximal to the arch. Lesions consisted of mixed stricture and aneurysm. The largest aneurysm measured 4mm. No patient had any clinical manifestation of their abnormality.

Discussion:
The relevance and natural history of such abnormalities is unreported. The adult literature for extra-cranial carotid aneurysms predominantly describes thrombo-embolism as the most commonly reported manifestation. In a case series of four symptomatic children with carotid artery aneurysms fro, a variety of aetiologies, one patient had CVA with focal neurological deficit, local signs were identifiable in all. We hypothesised as a mechanism, the use of silk snuggers’ for head and neck vessels during circulatory arrest and selective head and neck perfusion during cardiac bypass.
Patients undergoing neonatal bypass surgery with circulatory arrest other than Norwood do not routinely undergo advanced imaging, thus the true incidence of these anomalies remains undefined. Patient numbers in this report were insufficient for statistically significant delineation of risk factors for aneurysm.

This report highlights the importance of assessing proximal arch vessels during advanced imaging for complex patients who have undergone selective head and neck perfusion as part of arch reconstruction. The incidence, mechanism and natural history of these lesions remains undefined. Further evaluation and follow-up of these patients will be required to guide future practice.