

Images in Congenital Cardiac Disease

Echocardiographic diagnosis of left carotid artery arising from the pulmonary trunk

Viktor Tomek, Oleg Reich, Jan Skovranek

Kardiocentrum and Cardiovascular Research Centre, University Hospital Motol, Prague, Czech Republic

Keywords: Isolation of left carotid artery; vascular anomalies; neural crest migration

A THREE-WEEK-OLD MALE WITH CHOANAL ATRESIA and CHARGE association was referred for evaluation of a systolic murmur. Echocardiography (Fig. 1) revealed a right aortic arch (RAOA) with aberrant origin of the left subclavian artery (LSA), as well as a large, right-sided patent arterial duct (PDA). An abnormal vessel, arising from the bifurcation of the pulmonary trunk (MPA), and passing to the neck, was identified as the left carotid artery (LCAR). Angiography confirmed the diagnosis (Fig. 2; Abbreviations: LPA = left pulmonary artery, RCAR = right carotid artery, RSA = right subclavian artery). The left carotid artery was

translocated to the ascending aorta, and the duct was ligated via midline sternotomy. A left-sided arterial ligament was not observed at the time of surgery.

Only 5 cases of this malformation have thus far been reported. Right aortic arch with aberrant left subclavian artery was present in all. The hypothetical system for regression of the arteries of the pharyngeal arches proposed by Edwards not explain this anomaly, nor does an arterial duct connecting the pulmonary and left carotid arteries, as all but one of the described cases had a left-sided duct or ligament separate from the left carotid artery.

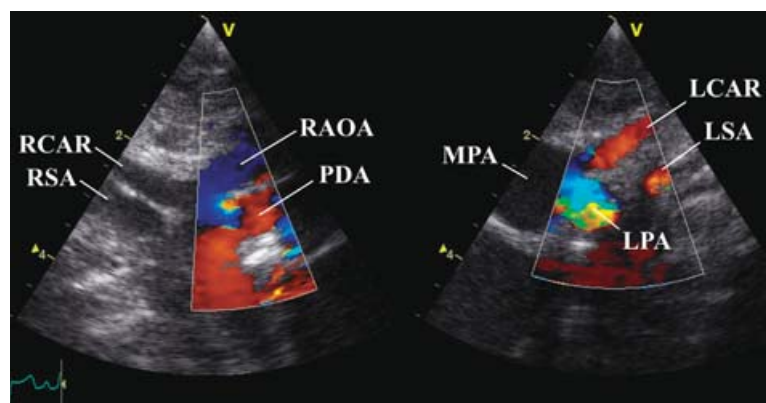


Figure 1.

Echocardiograms from the suprasternal approach. Left: right aortic arch with a huge right sided arterial duct. Right: left carotid artery arising from pulmonary artery bifurcation and aberrant left subclavian artery.

Correspondence to: Viktor Tomek, MD, Kardiocentrum and Cardiovascular Research Centre, University Hospital Motol, V uvalu 84, 150 08 Prague 5, Czech Republic. Tel: +420 22443 2900; Fax: +420 22443 2915; E-mail: viktor.tomek@seznam.cz

Accepted for publication 2 August 2007

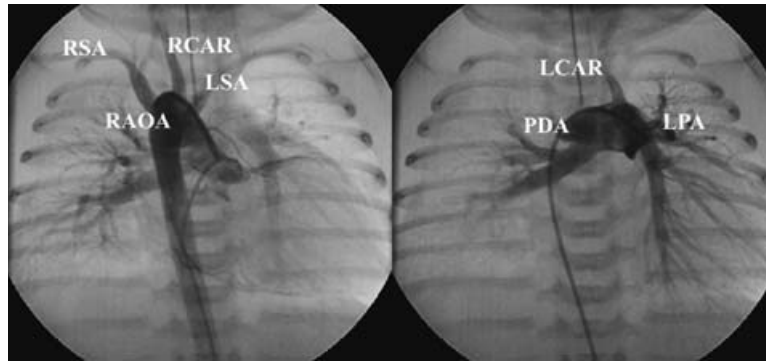


Figure 2.
Angiograms in frontal projection. Left: aortography. Right: transductal pulmonary artery injection.

We propose abnormal formation of the arterial pole of the developing embryo as a more likely explanation. CHARGE association, also present in our patient, is an anomaly of migration of cells from the neural crest. Manner et al.,¹ by ablation of such cells migrating from the neural crest in chicken embryos, have induced abnormal formation of the arterial pole resulting in origin of a left brachiocephalic artery from the pulmonary trunk in association with right aortic arch and aberrant left subclavian artery.

Acknowledgements

The publication was supported by the grant of the Czech Ministry of Health – VZ FNM 64203.

Reference

1. Manner J, Seidl W, Stesing G. The formal pathogenesis of isolated common carotid or innominate arteries: the concept of malseptation of the aortic sac. *Anat Embryol* 1997; 196: 435–445.