

Right Cervical Aortic Arch with Unusual Origin of Left Carotid Artery

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A 9-year-old boy presented with a history of lower respiratory infections and stridor. At age 18 months, he had undergone surgery for inguinal hernia and tracheoesophageal fistula. Physical examination now revealed a pulsatile mass in the right supraclavicular region.

Transthoracic echocardiography and aortography showed a right cervical aortic arch: the right subclavian artery and right carotid artery arose from the right cervical arch (Fig. 1), and the left carotid artery originated from the ascending aorta (Fig. 2). Computed tomography revealed this anatomic configuration and tracheal compression (Figs. 3 and 4). The patient was referred for cardiac surgery.

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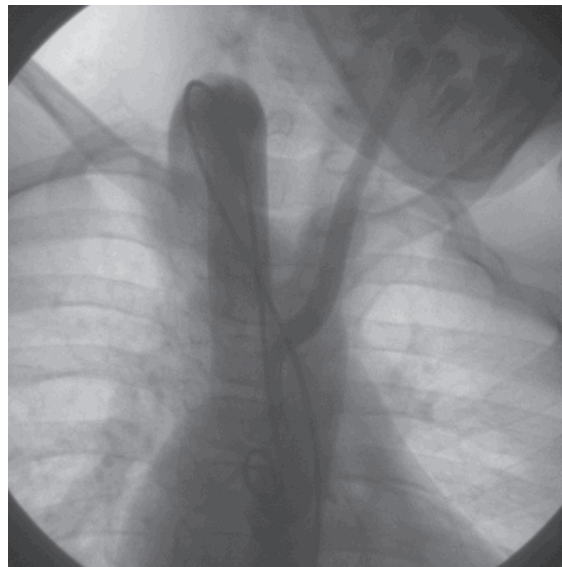


Fig. 1 Aortography during cardiac catheterization shows a right aortic arch.

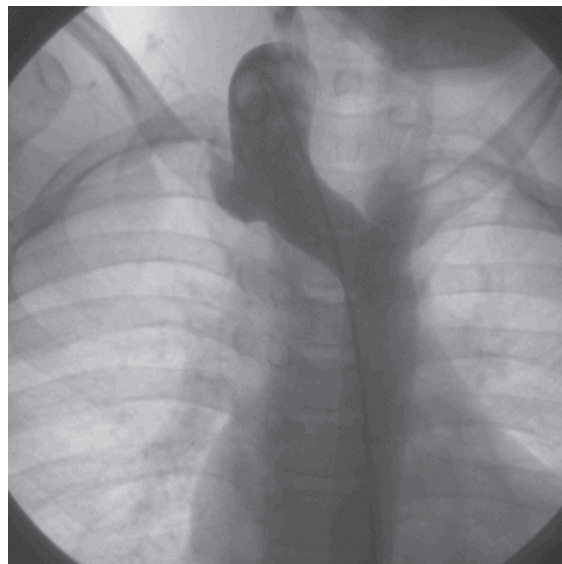


Fig. 2 Aortography during cardiac catheterization shows a right aortic arch and a left carotid artery that arises from the ascending aorta.

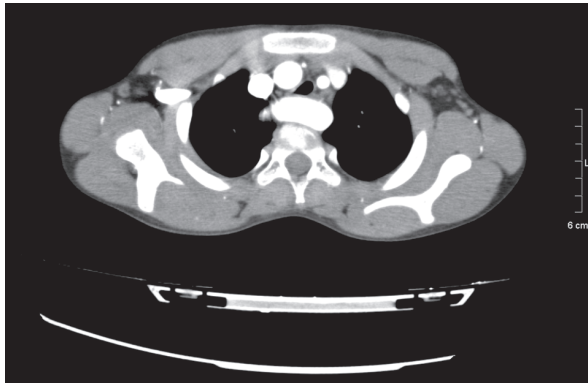


Fig. 3 Axial 64-slice multidetector computed tomographic image shows a right aortic arch and tracheal compression.



Fig. 4 Three-dimensional, volume-rendered, coronal 64-slice multidetector computed tomographic image shows tracheal compression, a right aortic arch, and a left carotid artery that arises from the ascending aorta.

Comment

Cervical aortic arch is a rare anomaly in which the arch extends above the level of the clavicle. Two subcategories of cervical arch are anomalous subclavian artery and vascular ring.¹

In the case of a right cervical aortic arch, an unusually long right-sided arch ascends into the right supraclavicular region, descends, and crosses behind the esophagus as a left descending aorta.² If an embryonic ductus caroticus persists, the 3rd arch becomes the definitive arch with separate internal and external carotid arteries

arising from it, as has been described in chromosome 22q11 deletion.³ An alternative explanation is failed migration of the aortic arch system. A rare type of vascular ring is formed by the combination of a right cervical aortic arch, an aberrant retroesophageal left subclavian artery from a Kommerell diverticulum, and a ligamentum arteriosum.⁴ Although most patients with right aortic arch are asymptomatic, some have dysphagia and respiratory distress from tracheal compression, as did our patient. Other possible findings are a pulsatile supraclavicular mass, discrepancies in blood pressure in the upper limbs, and loss of femoral or opposite-upper-limb pulses.

To our knowledge, this is the 1st report of right cervical aortic arch with a left carotid artery originating from the ascending aorta.

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