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Images in Congenital Heart Disease

Delineation of persistent fifth aortic arch using magnetic resonance angiography

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A 10-YEAR-OLD GIRL WAS REFERRED FOR A cardiac evaluation due to a 12-month history of intermittent palpitations, exercise induced dizziness, and chest-pain. Cardiac examination demonstrated a well-nourished African-American female with normal vital signs. The precordium was quiet and the apex beat was located in the fifth left intercostal space. There was a normal first heart sound but a widely split second heart sound and no audible murmurs. The chest was clear to auscultation and the liver was not enlarged. The electrocardiogram and 24 hour Holter monitor demonstrated normal sinus rhythm. An echocardiogram was performed to assess coronary arterial anatomy and demonstrated a small atrial septal defect of 5 mm diameter within the oval fossa, with no significant volume overload of the right heart. The aortic arch was left-sided, with no evidence of coarctation, but the coronary arterial origins could not be clearly visualized. In addition, there was a vascular structure arising from the inferior aspect of the aortic arch and coursing to the left, but its distal connection could not be visualized by echocardiography. Paracoronal maximal intensity projection of a three dimensional gadolinium magnetic resonance angiogram with sensitivity encoding technique (Figs 1 and 2b), along with sequential paracoronal tomographic magnetic resonance sections using the black blood double inversion turbo spin echo technique (Fig. 2a), were performed to evaluate this vascular anomaly. There was a double-barrelled aortic lumen, which was patent proximally and distally, representing persistence of the fifth aortic arch. The coronary arterial origins were normal, and the defect within the oval fossa was clearly visualized. An aorto-pulmonary collateral artery was also seen arising from the descending aorta.

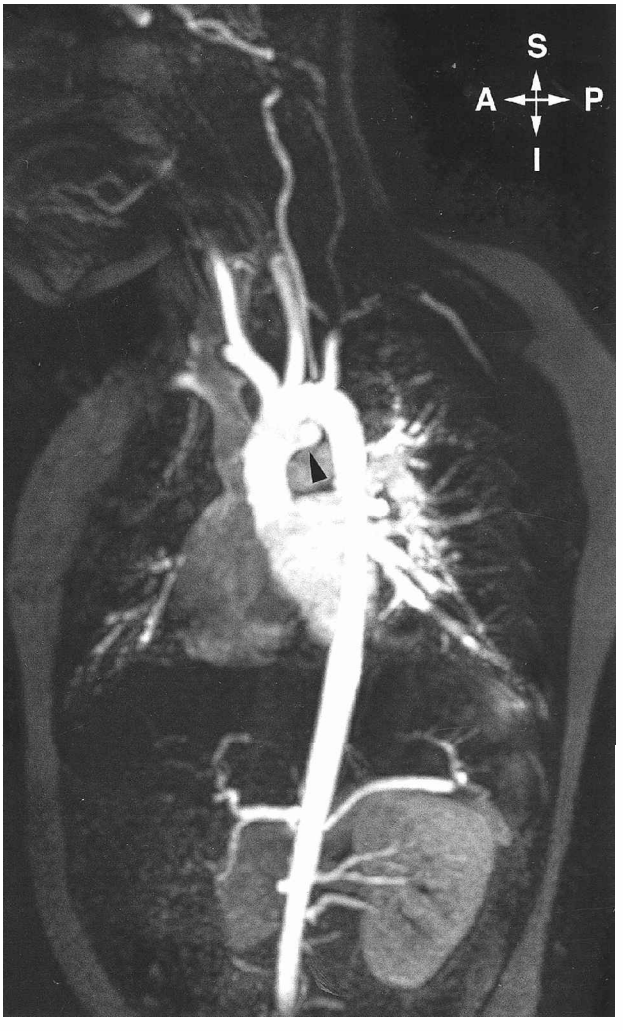

Figure 1.

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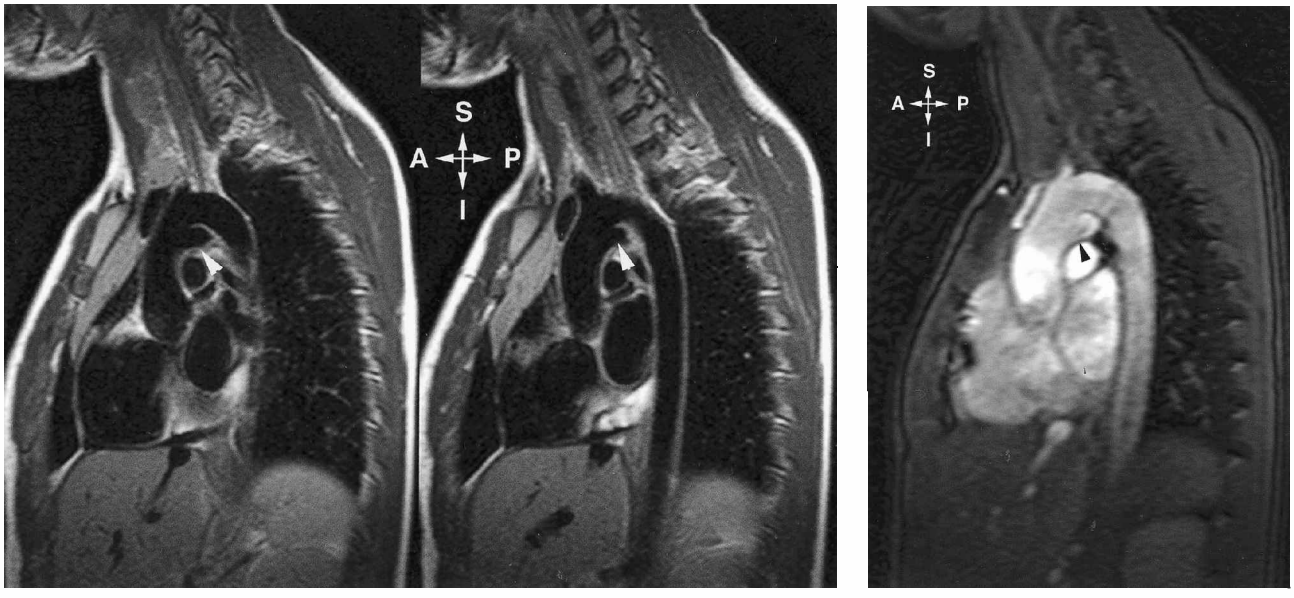

(a) (b)

Figure 2.

Persistence of the fifth aortic arch may occur in isolation, or in association with various anomlies such as patent arterial duct, interrupted aortic arch, and pulmonary atresia with tetralogy of Fallot. Presentation may be late into adulthood, and previous authors have drawn attention to the fact that this lesion may be deceptively rare only because of its powers of mimicry.[1] This short report demonstrates the utility of magnetic resonance angiography in exposing such attempted deception.

Reference

1. Gerlis LM, Anderson RH, DaCosta P. Persistent 5th aortic arch – a great pretender: three new covert cases. Int J Cardiol 1989; 23: 239–247.

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