A 27-year-old woman with slight mental retardation underwent a magnetic resonance imaging scan of the head in an outpatient clinic. In that examination, the neurocranium was unremarkable, but dissection of the right common carotid artery (CC) was suspected. The patient was transferred to our hospital. A Doppler ultrasound examination and magnetic resonance angiography of the aorta and the supraaortic vessels were performed. On physical examination, palpitations in the right superior thoracic aperture were noted.

Magnetic resonance angiography revealed a complex vascular anomaly: a retroesophageal aortic arch extending cranially to the level of the right thoracic aperture. No brachiocephalic trunk was present. The left CC was the first aortic branch arising 5 cm distal to the aortic valve (Figure, A and B). The second branching vessel, the right CC, had a length of only 1.5 cm before it branched into the internal carotid (IC) and external carotid arteries. The vessels were adjacent up to the level of the second cervical vertebra, where they separated (3.3 cm more cranial to the site of bifurcation on the left). The close proximity of IC and external carotid arteries, best visualized on ultrasound (Figure, C), imitated dissection on the cranial magnetic resonance image. The right subclavian artery, the third branch, gave rise to a large-caliber right vertebral artery (right vertebral artery = 6 mm versus right CC = 3 mm; Figure, D). The site of origin of the left subclavian artery, the fourth branch, was a circumscribed eccentric dilatation of the wall of the descending part of the aortic arch, known as Kommerell diverticulum.

Typically, during organogenesis, the aorta develops from the right fourth aortic arch out of a basic pattern of 6 pairs of primitive aortic arches. A cervical arch is formed when atresia of the fourth primitive aortic arch occurs. In this case, the right third primitive aortic arch developed into the cervical arch. A Kommerell diverticulum was a remnant of the left fourth aortic arch and was situated at the point of merger between the right aortic arch and the proximal descending thoracic aorta.

An aneurysm of the cervical arch required surgical repair. Given the normal diameter of the aorta in our patient, no further action was taken.

Disclosures
None.
Figure. A and B. Volume rendering of magnetic resonance angiography in anteroposterior view (A) and left lateral oblique view (B). Doppler ultrasound of the carotid arteries (C) and power Doppler ultrasound of the vertebral artery (D) are also shown. The cervical arch reaches the superior thoracic aperture on the right side. The first vessel originating from the aortic arch is the left common carotid artery (CC). The second is the right CC, which after only 1.5 cm branches into the external carotid (EC) and internal carotid (IC) arteries (C). There is a rudimentary brachiocephalic trunk that gives rise to the right subclavian artery (SA) and a large-caliber right vertebral artery (VA) (D). The left SA originates from a Kommerell diverticulum (K).
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