ANOMALOUS ORIGIN OF BOTH VERTEBRAL ARTERIES COMBINED WITH ABERRANT RIGHT SUBCLAVIAN ARTERY AND TRUNCUS BICAROTICUS

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ABSTRACT

We present a 50-year-old woman who was admitted to our institution with headache. Magnetic resonance angiography examination revealed truncus bicaroticus, aberrant right subclavian artery and bilateral vertebral artery anomalies in which the right vertebral artery and left vertebral artery orginates from right common carotid artery and aortic arch respectively. To our knowledge, coexistence of these anomalies is the first report in the English literature. The awareness of these variations is of great importance especially in endovascular intervention and head and neck surgery.

Key Words: *Vertebral artery anomaly, aortic arch anomaly, magnetic resonance angiography* ***Nobel Med 2012; 8(3): 124-126***

TRUNKUS BİKAROTİKUS VE ABERAN SAĞ SUBKLAVİAN ARTER İLE BİRLİKTELİK GÖSTEREN HER İKİ VERTEBRAL ARTER ORİJİN ANOMALİSİ

ÖZET

Baş ağrısı şikayeti ile hastanemize başvuran 50 yaşında kadın olgunun, manyetik rezonans anjiografi incelemesinde saptanan, supraaortik vasküler yapılara ait kombine anomalilerini sunuyoruz. Olguda aberan sağ subklavian arter, ana karotid arterlerin tek kök olarak aorttan çıktığı trunkus bikarotikus, arkus aortadan kaynaklanan sol vertebral arter ve sağ ana karotid arterden kaynaklanan sağ vertebral arter anomalilerinin birlikteliği görüldü. Bilgilerimize göre bu şekildeki anomali kombinasyonu literatürde ilk olarak görülmektedir.

Bu tip vakalarda, özellikle günümüzde artan tanısal anjiografi, endovasküler tedavi uygulamaları ve baş boyun cerrahisi öncesinde anomalinin farkında olunması büyük önem taşımaktadır.

Anahtar Kelimeler: Vertebral arter anomalisi, aortik ark anomalisi, manyetik rezonans anjiografi **Nobel Med 2012; 8(3): 124-126**

INTRODUCTION

Anomalies of the supraaortic great vessels are incidental findings during angiografic procedures, because most of the cases are clinically asymptomatic. Anomalous origin of both vertebral arteries concomitant with truncus bicaroticus is extremely rare. To our knowledge coexistence of these anomalies have not been reported to date in the English literature. Awareness of these variations is of clinical importance prior to vascular surgery and endovascular intervention. We discuss the possible embryologic development of this anomaly combination and related literature briefly.

CASE REPORT

A 50-year-old woman was admited to our hospital with the complaint of headache for about a month. Neurological examination was normal. During lomber puncture high cerebrospinal fluid pressure was observed. Subsequently, magnetic resonance imaging (MRI) of the brain, cranial and cervical 3D contrast enhanced magnetic resonance angiography (MRA) and magnetic resonance venography (MRV) were performed. Partial thrombus detected in the left internal juguler vein and the left sigmoid sinus on MRV imaging. Following appropriate treatment, symptoms of the patient resolved. In addition, the source and maximum intensity projection (MIP) images incidentally revealed that the right subclavian artery (RSCA) originated from the aortic arch as the last branch, right vertebral artery (VA) originated from the right common carotid artery (CCA), the left VA originated from the aortic arch as the second branch and both of the carotid arteries originated from the aortic arch as a common trunk also known as truncus bicaroticus (Figure 1, 2).

In addition, the right VA enters the transvers foramen of the C6 vertebra normally but the left VA enters the transvers foramen of the C7 vertebra. No intracranial vascular or parenchymal anomaly was detected on the cerebral MR and MRA images.

DISCUSSION

An aberrant RSCA, is commonly encountered anomaly of the aortic arch with an incidence of 0.5%. This variation is due to interruption of the fourth right aortic arch between the notches for the CCA and SA while the left fourth arch remains intact.[1]

Truncus bicaroticus, in which carotid arteries originate from a common truncus, possibly develops due to persistence of the septum intercaroticus that divides right and left third aortic archs. The prevelance of this anomaly is less than 0.2%.[2]

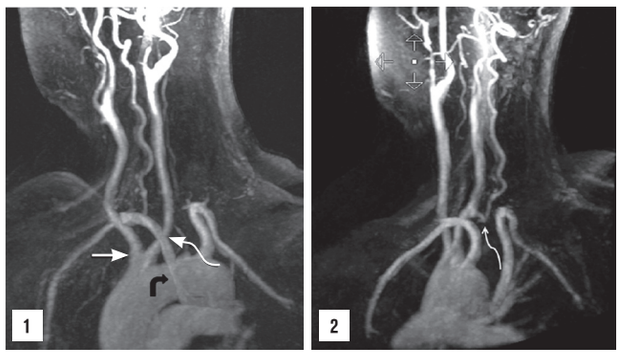

Figure 1. Magnetic resonance angiography image demonstrates the truncus bicaroticus (straight arrow), aberrant right subclavian artery (curved arrow) and left vertebral artery (wavy arrow) orginating from the aortic arch. **Figure 2.** Magnetic resonance angiography image demonstrates right vertebral artery orginating from the posterior side of right common carotid artery (arrow).

Embryologically, the origination of the left VA from the aortic arch and of the right VA from the right CCA can be explained by the persistence of the first or second dorsal intersegmental artery and persistence of the right sixth dorsal segmental artery, respectively.[3] The left VA anomaly was described between 2.4% to 5.8% in a large autopsy series. The anomalous origins of the right VA: directly from the aorta, from the common carotid artery, from the brachiocephalic artery and duplicated origin are rarer.[4,5]

In patients with 102 aberrant RSCA, Tsai et al. reported that 13.7% of the patients had right VAs originated from the right CCA, and 28.6% of this group also had left VAs originated from the aortic arch as the third branch.[6] Aside from these, in our case, left VA is the second branch of the aortic arch concomitant with truncus bicaroticus. To our knowledge, this is the first case in the literature. Anomalies of VAs are rarely symptomatic. Bernardi and Dettori suggested that anomalous origin of large aortic arch vessels can cause changes in cerebral hemodynamics.[7] Komiyama et al. was reported that increased incidence of arterial dissection with aberrant left VA.[8] The catheter angiography is gold standard for imaging. Nevertheless, currently, thanks to advanced MRA and multidetector computed tomography angiography (MDCTA) examinations, the anomalies of origin of aortic arch branches can be demonstrated optimally without intervention.

In conclusion, such abnormalities are incidental findings in endovascular and surgical procedures or at autopsies but prior to both diagnostic and interventional angiography and head and neck surgery to be aware of the anomaly may save time and ease procedures and also prevent the possible iatrogenic complications. For this reason, anomalies origin of supraaortic vessels should be taken into consideration.

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