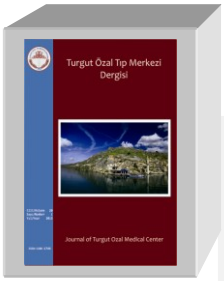

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A Rare Case Report: Thyrolingual Trunk and The Absence of Facial Artery Determined by 3D-CTA

Zülal Öner[1], Serkan Öner[2], Evren Köse[1], Suat Kamışlı[3], Kaya Saraç[2]

[1]İnönü Üniversitesi Tıp Fakültesi, Anatomi Anabilim Dalı, Malatya, Türkiye
[2]İnönü Üniversitesi Tıp Fakültesi, Radyoloji Anabilim Dalı, Malatya, Türkiye
[3]İnönü Üniversitesi Tıp Fakültesi, Nöroloji Anabilim Dalı, Malatya, Türkiye

Abstract
Thyrolingual trunk (TLT), arising from the branches of the external carotid artery (ECA), is well-known to be an anatomical variation. However, TLT may rarely originate from the common carotid artery (CCA). Here, we report a 59-year-old male patient with a diagnosis of cerebrovascular disease in whom TLT arising from the left CCA was incidentally determined by three dimensional angiography performed in order to evaluate carotid stenosis and intracranial vascular structures. TLT arose from the left CCA anterior and at its point of origin, infundibular dilatation was observed. On the right side, however, superficial temporal artery STA was originated from the CCA anterior. In addition, the facial artery (FA) was absent on the left, which is a rare variation. Awareness of variations in the cervical region is of great importance for the diagnosis of the pathologies and treatment.
Key Words: Common Carotid Artery; External Carotid Artery; Thyrolingual Trunk; Multidetector Computed Tomography.

Nadir Görülen Bir Vaka: 3D-CTA ile Tanımlanmış Truncus Thyrolingualis ve Arteria Facialis Yokluğu

Özet
Arteria carotis externa'nın (ECA) dallarından ayrılan truncus thyrolingualis'in (TLT) anatomik bir varyasyon olduğu iyi bilinmektedir. Ancak TLT nadiren de olsa arteria carotis communis'ten (CCA) köken almaktadır. Biz burada 59 yaşında tanımlanmış serebrovasküler hastalığı (SVH) olan bir erkek hastada karotis stenozunu ve intrakraniyal vasküler yapıları değerlendirmek amacıyla üç boyutlu CT anjiyografi (3D-CTA) çekilmesi sonucunda rastladığımız sol CCA'dan köken alan TLT olgusunu sunmaktayız. TLT, sol CCA'nın anterior yüzünden ayrılmaktaydı. TLT'nin CCA'dan çıkış yerinde infundibuler dilatasyon meydana gelmişti. Sağ tarafta ise süperfisyal temporal arter (STA), CCA anterior yüzünden çıkmaktaydı. Ayrıca bu vakada rastladığımız nadir görülen bir varyasyon da arteria facialis (FA) yokluğuydu. Sağ tarafta FA gözlenirken sol tarafın FA'sı gözlenmemiştir. Boyun bölgesine ait arter varyasyonlarının bilinmesi bu bölgeye ait patolojilerin tanı ve tedavisi açısından oldukça önemlidir.
Anahtar Kelimeler: Arteria Carotis Communis; Arteria Carotis Externa; Truncus Thyrolingualis; Multidetektör Bilgisayarlı Tomografi.

INTRODUCTION

Although the branches of the external carotid artery (ECA) are known to have variations, they are usually asymptomatic and incidentally discovered. These variations are usually seen as bifurcation or trifurcation with a common trunk from the ECA. However, their arising from the common carotid artery (CCA) with a common trunk is a very rare occasion (1, 2).

The facial artery (FA) usually arises from the ECA on the anterior and a little above the lingual artery. The variations of the FA have been documented by different authors. Here, we present a patient of thyrolingual trunk (TLT) arising from the CCA and absence of the left FA.

CASE REPORT

A 59-year-old male patient applied to the Neurology outpatient clinic of Inonu University Turgut Ozal Medical Center with the complaints of syncope was performed 3D-CT angiography to evaluate carotid stenosis and intracranial vascular structures. A 64-detector spiral CT scanner (Aquilion 64; Toshiba Medical, Tokyo, Japan) was used. Nonionic contrast medium (100 ml) was injected at a rate of 4.0 ml/s through an antecubital vein with an automatic power injector. A bolus tracking technique was used to select the individual start delay for the arterial phase. Repetitive low-dose scans were performed at a level inferior to the carotid bifurcation (CB) with a delay of 8 s. The region of interest was placed in the CCA to measure the bolus arrival time. The scanning procedure started automatically once the enhancement level of 90 HU was reached. The scan volume included aortic arch to vertex for arterial phase scan. The scanner settings were 120 kV, 250 mA, 64×0.5 mm slice collimation, table speed 20.5 mm/rotation (pitch 0.641), and rotation time 0.75 s. The patient was instructed to hold the breath and avoid swallowing during the arterial phase scan. Image processing was done on a workstation (Vitrea 2, Vital Images) using the volume rendering technique. Rotational images of the bilateral three-dimensional vascular architecture were produced and viewed from different angles.

On 3D-CTA, TLT arose from the interior part of the left CCA anterior (Figure 1). The distance between the CB and the upper margin of the infundibular dilatation was 6.4 mm, and the infundibular dilatation was 10.1 mm in diameter. The internal diameter of the TLT was 3.5 mm, and the angle between the TLT and CCA was 142.8°. At 8 mm on its route, TLT bifurcated into the STA and LA. The internal diameters of the STA and LA at their origin were 1.7 and 2.5 mm respectively, and the angle between the two was 76.8°. CB was located 15 mm above the greater horn of the hyoid bone (HB), and TLT was 2.8 mm above the tip of the greater horn of the HB.

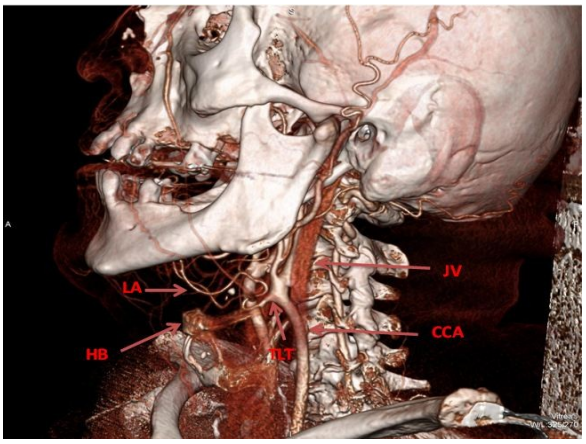

Figure 1: 3D-CTA image of the left carotid artery and hyoid bone. CCA common carotid artery, JV jugular vein, TLT thyrolingual trunk, HB hyoid bone, LA lingual artery.

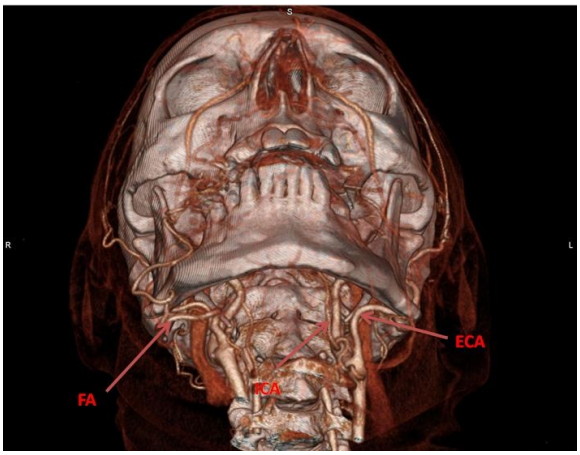

Figure 2 : 3D-CTA image of the left and right carotid artery. ECA external carotid artery, ICA internal carotid artery, FA facial artery.

While the right FA was observed, no left FA was noted (Figure 2). The initial artery arising from the left ECA was the occipital artery that bifurcated from the posterior On the right side, however, STA originated from the interior part of CCA anterior as a single branch. Furthermore, fenestration was observed in the basilar artery that was 1 mm in diameter and extended 9.3 mm from one outer end to the other, 5.8 mm after the merging of the right and left arteries. The orifice of the basilar fenestration at the origin was 3.1 mm, and at the terminating point, 2.9 mm in diameter.

DISCUSSION

The CCA does not generally produce terminal branches. Nevertheless, the vertebral, superior thyroid, superior laryngeal, ascendens pharyngeal, inferior thyroid or occipital artery may rarely originate from the CCA (7). The STA, the first branch of the ECA, sometimes arises from the CCA (2). The incidence rate of this anomaly has been reported to vary between 1% and 54% (2, 8, 9). Toni et al. have maintained that the STA frequently arises from the ECA on the right and from the CCA on the left (9). In our patient, the STA arose from the CCA on the right. The LA usually originates from the ECA above the STA. However, it may rarely originate from the CB level (10). Moreover, literature presents few cases where the LA originated from the CCA (11). In our case, while the STA arose from the CCA on the right, the LA arose from the ECA. On the left, however, the STA and LA originated from the CCA anterior with a common trunk. In the study by Ozgur et al., the incidence rate of TLT arising from the ECA was reported to be 0.7-3% (12). Iwai et al. have reported an incidence rate of 0.38% for TLT arising from CCA (1). Lemaire et al. described as case where TLT arose from the CCA and was 5.2 mm in length, and it originated from 30 mm below the CB (2). In our case, however, it was 8 mm in length and the distance between the infundibular dilatation and CB was 6.4 mm.

CB is usually located in at the level of upper margin of the thyroid cartilage. It has been reported to be located at a higher level than the upper margin of the HB at an incidence of 12.5% (13). Lemaire et al. found that the CB was located 13.2±5.6 mm below the upper end of the greater horn of the HB (8). In our case, on the other hand, it was 15 mm above the greater horn of the HB. Similarly, Iwai et al. reported that CB was located 11.2 mm above the greater horn of the HB (1). In their case, TLT was 2.7 mm below the upper end of the greater horn of the HB, while in our case; it was located 2.8 mm above the greater horn of the HB.

In the case reported here, the absence of unilateral FA, which is a rare variation, was striking. Ezure et al. reported a case where the left FA was completely absent and this was compensated by a larger than normal transverse facial artery (5). Adachi evaluated 146 cadavers and found that in only one of the 292 sides, absence of FA was compensated by the transverse facial artery (3). In our case, the left FA was absent, but there was no transverse facial artery. We believe that the left FA was compensated by the thin collaterals of the maxillary artery and ophthalmic artery. The FA is generally targeted for superselective intra-arterial chemotherapy of some cranial cancers (1). Therefore, through knowledge of the anatomical variations of this area is important.

In addition to the variations presented above, another variation in our case was the basilar fenestration.

Postmortem studies have provided a high incidence rate of 5.26% for basilar artery (14), while its angiographic prevalence varied between 0.04% and 0.06% (15). Uchino et al. (16), in their study with MRA, reported an incidence rate of 2.07% and showed that 94% of the fenestrations occurred in the proximal segment. In our case, it was observed in the lower half of the artery as well. In conclusion, for surgical and interventional approaches to the cranial and cervical area, awareness and description of potential variations are highly important.

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Correspondence/İletişim

Zülal ÖNER
İnönü Üniversitesi Tıp Fakültesi, Anatomi Anabilim Dalı, Malatya / TURKEY
GSM: 0532 5873438
Email: zulal.ekincioglu@inonu.edu.tr

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