

Case report**ANOMALOUS ORIGIN OF OCCIPITO-AURICULAR TRUNK FROM EXTERNAL CAROTID ARTERY****Prakash Billakanti Babu***Anatomy Department, Kasturba Medical College, Manipal University, Manipal, Karnataka, India***RESUMEN**

Las anomalías en el origen y patrón de ramificación de la arteria carótida externa (ACE) son comunes. El nivel de la bifurcación de la arteria carótida común (ACC) y las variaciones en el origen / patrón de ramificación de la arteria carótida externa están bien documentados. En el hallazgo de las arterias occipitales y posteriores surgían de un corto tronco común de la ACE en el lado izquierdo. El conocimiento de las variaciones en el origen y curso de las ramas de la ACE son de suma importancia en la cirugía. Los cirujanos deben ser conscientes de la posibilidad de encontrar estas variaciones, ya que pueden conducir a dificultades en la distinción de las ramas de la arteria carótida externa. Este conocimiento es también importante para los radiólogos en la interpretación de las imágenes de las regiones de la cara y el cuello.

Palabras clave: *la arteria carótida externa, el tronco occipito-auricular.*

ABSTRACT

Anomalies in the origin and branching pattern of the external carotid artery (ECA) are common. The level of the bifurcation of the common carotid artery (CCA) and the variations in the origin/branching pattern of the external carotid artery are well documented. In the present finding occipital and posterior auricular arteries were arising by a short common trunk from ECA on the left side. Knowledge of variations in the origin and course of branches of ECA is of importance in surgery. Surgeons need to be aware of the possibility of encountering such variations, as they may lead to difficulties in differentiating the branches of external carotid artery. This knowledge is also important for radiologists in the image interpretation of the face and neck regions.

Key words: *External carotid artery, occipito-auricular trunk.*

INTRODUCTION

External carotid artery (ECA) is the chief artery of head and neck region. It begins laterally to upper border lamina of thyroid cartilage, and extends up to a point behind the neck of the mandible, providing altogether eight branches of which the superficial temporal and maxillary are the two terminal branches. Knowledge of variations of ECA is essential for maxillo-facial and neck surgeries. The detailed knowledge of the gross and radiological anatomy of external carotid artery and its branches is essential for application of angiography in the diagnosis of lesions affecting the neck, face and scalp. The abnormalities most readily diagnosed are tumors, vascular malformations or bony disorders.

Due to the increasing need of finding out new safe surgical procedures in the region of neck and head, variations in the branching pattern of blood vessels are more often described, Benson and Hamer (1988). Procedures which need a greater knowledge of the course of the occipital artery include: 1. The biopsy of the artery when one suspects of cranial arteritis with involvement of the occipital artery, Schmidt and Adelman (2001). 2. Transfer of hair-bearing tissue blood-supplied by occipital artery, Matloub et al. (1992).

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3. Surgical procedures involving flap management in the head and neck region, Sharma et al. (1996) as well as angiographic studies Gluncic et al. (2001).

Many authors have described variations in the origin of the occipital artery Adachi and Hasebe

(1928); Altman (1947); Newton and Young (1968); Mustuda et al. (1977) and Benson and Hamer (1988). Kaneko et al. (1996) have described this artery sometimes arising from the internal carotid artery, thyrocervical trunk, inferior thyroid artery or a branch of ascending cervical.

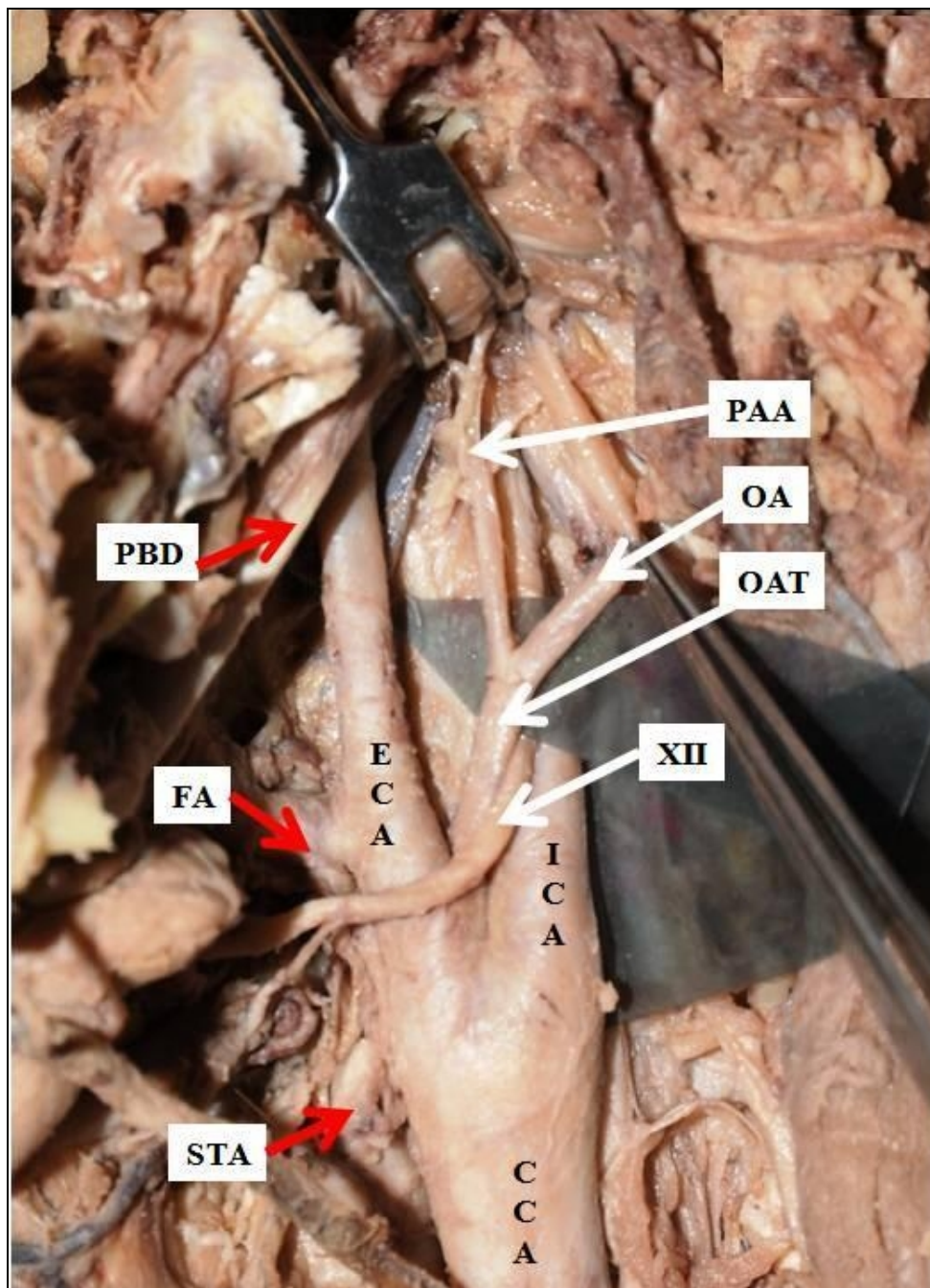


Figure 1.- Dissection of the left side of neck showing origin of occipitoauricular trunk from Left external carotid artery. OAT - Occipitoauricular trunk; OA- Occipital artery; PAA- Posterior auricular artery. CCA - Common carotid artery; ECA- External carotid artery. ICA - Internal carotid artery. STA - Superior thyroid artery. FA - Facial artery. XII - Hypoglossal nerve. PBD - Posterior belly of digastric muscle.

A few authors have reported the origin of occipital artery from external carotid artery close to the carotid bifurcation, Adachi and Hasebe (1928). Zümre et al. (2005) reported about the presence of linguofacial trunk, thyrolingual trunk, thyrolinguofacial trunk and occipitoauricular trunk in the human fetuses. In the present case occipital and posterior auricular arteries were arising by a common trunk from posterior aspect of ECA just above the carotid bifurcation on the left side. The trunk was hooked by hypoglossal nerve at its commencement.

CASE REPORT

During routine dissection for Medical Students in the Department of Anatomy, KMC Manipal in an adult male cadaver an anomaly of origin of occipital and posterior auricular arteries arising from ECA was observed on the left side. Superior thyroid artery, lingual artery and facial artery arose from the anterior aspect of external carotid artery. At the level of the origin of the facial artery, below the posterior belly of digastric muscle, occipitoauricular trunk after its origin from ECA crossed ICA on its lateral side and later divided into occipital and posterior auricular arteries (Fig.1). The posterior auricular artery was running below and later deep to the posterior belly of digastric muscle. Later external carotid artery was observed coursing upwards in its usual anatomical location to the parotid gland and terminated by dividing into maxillary and superficial temporal arteries. The origin and course of ascending pharyngeal was normal arising from medial aspect of external carotid artery near the origin on both sides. On the right side the origin and course of posterior auricular and occipital arteries arising from the ECA are without any change/variation.

DISCUSSION

Classically the occipital artery arises from the posterior aspect of the external carotid artery (Lasjaunias et al., 1978; Standring et al., 2008) 20 mm further the carotid bifurcation. Studies by Newton and Young (1968) reported three cases where in two of them this artery branched from the internal carotid artery 20 mm from the carotid

bifurcation. Lasjaunias et al. (1978) showed that the occipital artery could arise from the internal carotid artery or vertebral artery. Anatomy treatises present the occipital artery as usually branching from the posterior aspect of the external carotid artery, approximately 2cms from its origin just below the hyoid bone, Standring et al. (2008). At its origin it is crossed superficially by the hypoglossal nerve which winds around it from behind. The artery runs backwards and up and deep to the posterior belly of the digastric muscle and ends in the posterior aspect of the head, Standring et al. (2008).

Studies by Adachi and Hasebe (1928) on 298 subjects described only two cases of left occipital artery branching off the carotid bifurcation, characterizing a trifurcation of the carotid tripod. This important variation could lead to severe complications when radiographic evaluation or surgical procedures were done in the neck region. Kaneko et al. (1996) have shown the origin of the occipital artery arising from common carotid artery together with sternocleidomastoid artery.

In the angiographic studies of Takenoshita (1983) the superficial temporal, maxillary and occipital arteries originated from internal carotid artery. Variations in the branching pattern of the external carotid artery have been reported earlier by several authors. Zümre et al. (2005) observed a linguofacial trunk in 20% of the cases, a thyrolingual trunk in 2.5%, a thyrolinguofacial trunk in 2.5%, and an occipitoauricular trunk in 12.5% of the cases in studied human fetuses. Studies by Thwin et al. (2010) reported common occipitoauricular trunk on right side with high origin of ascending pharyngeal arteries on both sides.

Studies by Anil et al. (2000) reported a case where the occipital and posterior auricular arteries were arising as a short common trunk. According to Lippert and Pabst Springer (1985) in 85% of cases occipital and posterior auricular arteries originate separately from the external carotid artery, and in 14% of cases they arise as a common occipitoauricular trunk. In the present case, occipital and posterior auricular arteries arose from ECA as short common trunk which was later divided into two separate branches. It was also observed that occipital artery had slightly a larger caliber than the posterior auricular arteries. Anatomical knowledge of variations in the branching pattern of the external carotid artery will be useful in angiographic studies, transcatheter embolisation procedures and in surgical procedures of the head and neck region.

REFERENCES

- Adachi B, Hasebe K.* 1928. Das Arteriensystem der Japaner. Kyobo, Maruzen, Kaiserlich Japanischen Universitat zu Kyoto, V.1, 58-96.
- Altmann F.* 1947. Anomalies of the internal carotid artery and its branches: Their Embryological and Comparative Anatomical Significance. Report of a New Case of Persistent Stapedial Artery in Man. *Laryngoscope.* 57:c313-39.
- Anil A, Turgut HB, Peker T, Pelin C.* 2000. Variations of the branches of the external carotid artery. *Gazi Med J;* 11: 81-3.
- Benson MT, Hamer JD.* 1988. Anomalous origin of the occipital artery from the cervical internal carotid artery. *J. Vasc. Surg.* 8: 643-5.
- Gluncic V, Petanjek Z, Marusic A, Gluncic I.* 2001. High bifurcation of common carotid artery, anomalous origin of ascending pharyngeal artery and anomalous branching pattern of external carotid artery. *Surg. Radiol. Anat* 23: 123-5.
- Kaneko K, Akita M, Murata E, Imai M, Sowa K.* 1996. Unilateral anomalous left common carotid artery: a case report. *Ann. Anat.,* 178: 477-80.
- Lasjaunias P, Théron J, Moret J.* 1978. The occipital artery. *Neuroradiology,* 15: 31-7.
- Lippert H, Pabst R.* 1985. Arterial variations in man. Classification and frequency. JF Bergman Verlag: Minchen, 84
- Matloub HS, Yousif NJ, Ye Z, Sanger JR.* 1992. The occipital artery flap for transfer of hair-bearing tissue. *Annals of Plastic Surgery,* 29: 491-5
- Matsuda I, Handa J, Handa H, Mizunom H.* 1977. Bilateral anomalous occipital artery of internal carotid origin: case report. *Nippon Geka Hokan.* 46: 57-61.
- Newton TH, Young DA.* 1968. Anomalous origin of the occipital artery from the internal carotid artery. *Radiology* 90: 550-2.
- Schmidt D, Aldemann G.* 2001. The course of the occipital artery? An anatomical investigation for biopsy in suspected vasculitis. *European J. Med. Research,* 6: 235-41.
- Sharma R K, Kobayashi K, Jackson IT, Carls FR.* 1996. Vascular anatomy of the galea occipitalis flap: a cadaver study. *Plastic and Reconstructive Surgery,* 97: 25-31.
- Standring S, Johnson D, Collins P, Mahadevan V.* 2008. *Gray's Anatomy,* 40th edition, Churchill Livingstone, London, 446-447.
- Takenoshita H.* 1983. Case of hypoplasia of the internal carotid artery associated with persistent primitive hypoglossal artery. *Kaibogaku Zasshi;* 58: 533-50.
- Thwin SS, Soe MM, Myint M, Than M, Lwin S.* 2010. Variations of the origin and branches of the external carotid artery in a human cadaver. *Singapore Med J* 51:e40–e42.
- Zumre O, Salbacak A, Cicekcibasi AE, Tuncer I, Seker M.* 2005. Investigation of the bifurcation level of the common carotid artery and variations of the branches of the external carotid artery in human fetuses. *Ann Anat.* 187: 361-69.