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Case Report

ANOMALOUS ORIGIN OF LEFT VERTEBRAL ARTERY FROM THE ARCH OF AORTA AND PRESENCE OF DOUBLE ASCENDING PHARYNGEAL ARTERY ON THE LEFT SIDE: A CASE REPORT

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ABSTRACT

Backgrounds: The vertebral artery, being a part of the subclavian arterial system, has significant contribution in cerebral vasculature. Several researchers have reported anomalous origins of the vertebral artery earlier. Reporting of this relatively rare anomalous origin of vertebral artery with associated other vascular anomalies may help to widen the medical record regarding this important arterial system and henceforth will give broader idea to the clinicians about the possible variations during surgical and interventional procedures on this arterial system.

Results: The anomalous origin of left vertebral artery from aortic arch and other associated vascular anomalies were noted during the routine academic dissection in an embalmed male cadaver of 70 yrs in the said institution's anatomy department.

On the left side the vertebral artery originated from arch of aorta instead of subclavian artery between left common carotid artery and left subclavian artery. Also there were two ascending pharyngeal arteries on the left side originating from the external carotid artery; tThe branches from one supplied the pharynx (pharyngeal trunk) and the other one provided meningeal branches (neuromeningeal trunk). On the right side the origin of the vertebral artery and the number of ascending pharyngeal artery were both normal.

Conclusions: Anatomical and morphological variations of the vertebral artery are of immense importance in surgery, angiography and other non-invasive and invasive clinical procedures. So it is of great importance to know the possible rare variations of the origin of the vertebral artery along with this rare instance of double ascending pharyngeal artery on left side.

KEYWORDS: Vertebral artery, Ascending pharyngeal artery.

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INTRODUCTION

The vertebral artery, being a part of the subclavian arterial system, has significant contribution in cerebral vasculature. In both sides, the origin of the vertebral artery is

usually from the first part of the subclavian artery. Different kinds of anomalous origin of the vertebral artery are found in existing medical literatures. The ascending pharyngeal artery is a branch of external carotid artery just after its origin. Prior medical records exist regarding variations of origin of ascending pharyngeal artery, but existing case report regarding presence of more than one ascending pharyngeal arteries is not readily accessible. Nevertheless reporting of this relatively rare anomalous origin of the vertebral artery with associated anomalies in ascending pharyngeal artery in the left side may help to widen the medical record regarding this important arterial system.

CASE REPORT

The anomalous origin of left vertebral artery from aortic arch and other associated vascular anomalies were observed during the routine academic dissection in an embalmed male cadaver of 70 yrs in the said institution's anatomy department.

Clinical record:

Fig. 1: Arch of aorta and origin of left vertebral artery.

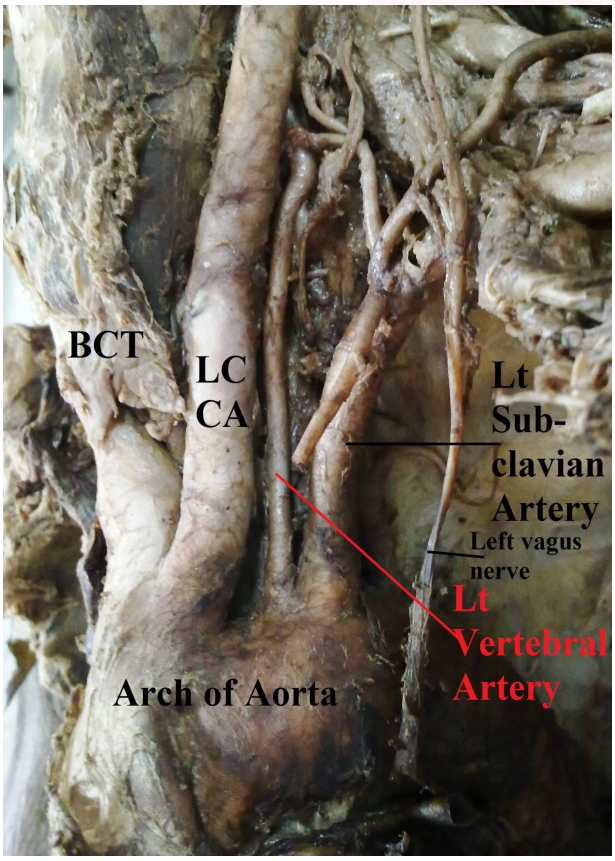


Fig. 2: Double ascending pharyngeal artery of left side.

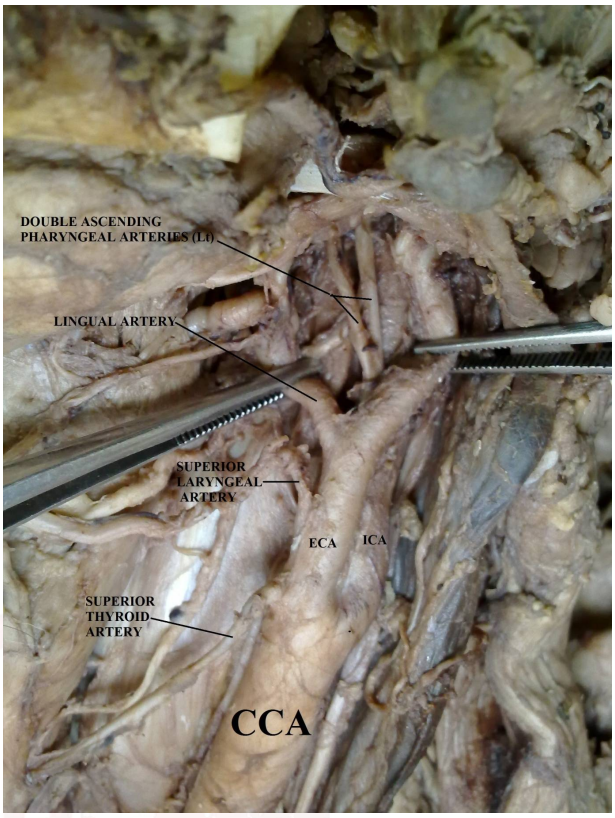
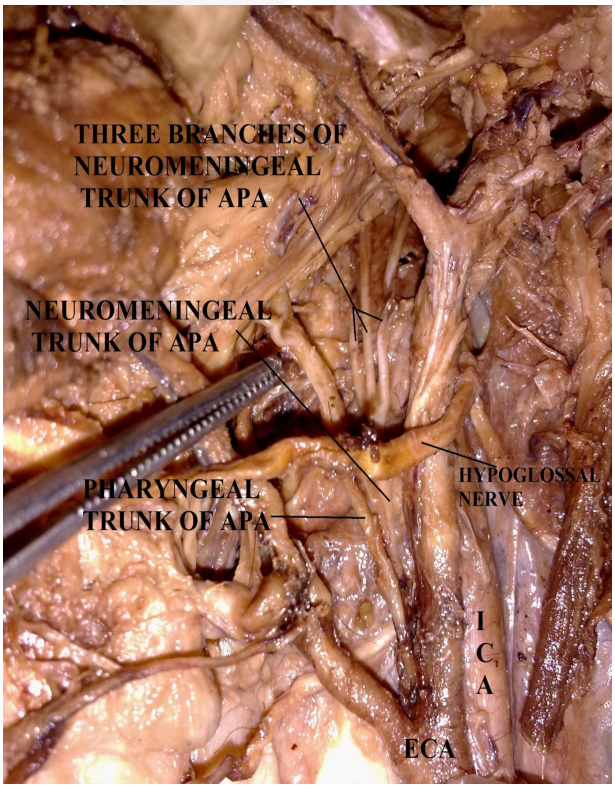


Fig. 3: Branches of ascending pharyngeal artery of left side.



1. On the left side, instead of subclavian artery, the left vertebral artery (LVA) originated from the arch of aorta between its two branches, left common carotid artery (LCCA) and left subclavian artery (LSA). (Fig 1)

2. There were two ascending pharyngeal arteries on the left side originating from the external carotid artery; the pharyngeal branches originated from one and the meningeal branches from the other. (Fig 2,3)

3. No such anomaly was found in the corresponding arteries on the right side or in the other parts of the body.

DISCUSSION

Literatures are found regarding various anomalous origin of vertebral artery (VA), arising from the aortic arch, between the LCCA and LSA or distal to LSA, from the thyro-cervical trunk, from the brachio-cephalic trunk, from the common carotid artery, from the external carotid artery, from a trunk formed by LSA and LVA. Specifically previous few studies recorded the anomalous origin of LVA from the arch of aorta between LCCA and LSA [1]. According to previous reports, the frequency of the LVA originating from the aortic arch ranges from 2.4 % to 6.9 %. But, most authors have recorded that it is about 2.5-3 % [2].

This anomalous origin has its importance related to different clinical situations. The most common site of the consequent stenosis, is its origin [2]. According to some authors the unusual origin of the VA may cause cerebral disorders because of alterations in the cerebral haemodynamics [3]. Some study reported a variation in the origin of VA, where the case was asymptomatic [4].

The development of the arch of aorta and its primary branches are from the primitive ventral aorta, and 6 sets of matched aortic arches, where as the vertebral arteries originate from the distal end of the 7th dorsal inter segmental artery, branches of the dorsal aorta, bilaterally [5]. In the present case, the left sixth dorsal inter segmental artery might have persisted as the first part of vertebral artery hence LVA was arising from the arch of aorta.

In our case we also observed two ascending pharyngeal arteries in the left side, originating from the medial or deep surface of the left external carotid artery just after the bifurcation of common carotid artery. S.Cortés-Franco et al in 2012 reported three cases of anomalous origin of ascending pharyngeal artery from ICA [6]. V. Gluncic et al in 2001 reported a case of anomalous origin of ascending pharyngeal artery (APA) from Internal Carotid Artery (ICA) just before its bifurcation which is higher than normal [7]. Though there have been several mentions about the anomalous site of origin for APA in earlier literatures [8,9]. We couldn't find any previous mention regarding the double APA.

The embryological explanations of such variations though not clear, but this anatomic situation may have certain important clinical implications especially where interventional neuroradiology plays an important role in management. The ascending pharyngeal artery plays an important role in the healing process of Le Fort I osteotomies, because it supplies the attached posterior palatal soft tissue pedicle. Among the other clinical situations, epistaxis, trauma, head and neck tumours, skull base tumors and other local vascular lesions are worth mentioning [10].

CONCLUSION

The anatomic and morphologic variations of LVA and ascending pharyngeal artery are significant for diagnostic and surgical procedures in the head and neck region. It is of clinical importance to know the origin and course of prevertebral segment of the vertebral artery in detail and being aware of the possible variations, to assess vascularisation in this region prior to conducting surgical procedures. The extra cranial portion of VA is frequently affected from atherosclerosis. Anomalous VA origin also represents a potential pitfall in diagnostic cerebrovascular injury. The endovascular interventionists and the diagnostic radiologists must be aware of variations of the VA, to both identify them correctly and to know where to search for them when the vessels are not seen in their normal position while undertaking any clinical procedures.

Similarly the variations of ascending pharyngeal artery are also worth mentioning. This particular artery, though a small one, have immense clinical importance as it supplies vital structures of pharynx and base of the skull region by either directly or forming important anatomises. So it is very important to look for this relatively

rare variation which, so far has not been mentioned earlier, before undergoing any surgical procedures in that region.

ABBREVIATIONS

VA- Vertebral artery
LVA- Left vertebral artery
LCCA- Left common carotid artery
LSA- Left subclavian artery
ICA- Internal carotid artery
APA- Ascending pharyngeal artery
ECA- External carotid artery
BCT- brachio-cephalic trunk
CCA- Common carotid artery

Conflicts of Interests: None

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