## Ascending pharyngeal artery



The ascending pharyngeal artery is an artery in the neck that supplies the pharynx.

It arises from the back part of the external carotid artery, near the commencement of that vessel, and ascends vertically between the internal carotid artery and the side of the pharynx, to the under surface of the base of the skull, lying on the longus capitis.

It is the smallest branch of the external carotid artery and is a long, slender vessel, deeply seated in the neck, beneath the other branches of the external carotid and under the stylopharyngeus muscle. It lies just superior to the bifurcation of the common carotid arterys.

The artery most typically bifurcates into embryologically distinct pharyngeal and neuromeningeal trunks. The pharyngeal trunk usually consists of several branches which supply the middle and inferior pharyngeal constrictor muscles and the stylopharyngeus, ramifying in their substance and in the mucous membranes lining them. These branches are in hemodynamic equilibrium with contributors from the internal maxillary artery. The neuromeningeal trunk classically consists of jugular and hypoglossal divisions, which enter the jugular and hypoglossal foramina to supply regional meningeal and neural structures, being in equilibrium with branches of the vertebral, occipital, posterior meningeal, middle meningeal, and internal carotid arteries (via its caroticotympanic branch, meningohypophyseal, and inferolateral trunks). Also present is the inferior tympanic branch, which ascends towards the middle ear cavity; it is involved in internal carotid artery reconstitution via the "aberrant carotid artery" variant. The muscular branch of the ascending pharyngeal artery is in equilibrium with the odontoid arcade from the vertebral artery.

The ascending pharyngeal artery (APA) may, in very rare cases, supply the posterior inferior cerebellar artery (PICA). In reported cases, when such is the case, the ipsilateral vertebral artery (VA) does not supply the PICA, and most of the time it is hypoplastic.

## **Case series**

Shibao et al. from the Keio University School of Medicine, Tokyo, retrospectively analyzed data from patients with carotid body tumors (CBTs) who underwent transarterial embolization or angiographic examination-only between July 2010 and February 2017. The arterial supply of the tumors, the number of feeder pedicles, the mean tumor size, embolization materials, complication of

embolization, and extent of tumor removal were assessed. The embryological origin of feeding artery was considered based on the literature.

Eighteen patients with 20 CBTs underwent preoperative embolization or angiographic examination. The number of feeder pedicles was significantly related to the size of the CBT (p = 0.0002). The main feeding artery was the descending branch of ascending pharyngeal artery (APhA), which was hypertrophied and tortuous (18/20, 90%). Embryologically, this artery originated from the musculospinal branch and is termed the "descending musculospinal branch".

The main feeder of the CBTs was the "descending musculospinal branch" of the APhA and needs special consideration such as dangerous anastomosis for embolization <sup>1)</sup>.

## **Case reports**

Effendi et al. described a unique cadaveric observation of a direct anastomosis between the posterior division (neuromeningeal) of the jugular branch of the APA and the PICA, where the PICA is also supplied by a normal-size VA.

A direct connection between the APA and the PICA was examined in a cadaveric specimen using a 3dimensional endoscope and a surgical microscope.

The enlarged jugular branch of the posterior division of the APA entered intracranially via the jugular foramen in its pars vascularis. It then connected directly with the lateral medullary segment of the PICA. The first segment of the PICA originated from a left vertebral artery of normal size and continued its normal course beyond the junction with the jugular branch of the APA.

Both the VA and the jugular branch of the APA may simultaneously supply the PICA territory. Recognition of this anatomic variant is relevant when planning surgical or endovascular treatments <sup>2</sup>).

1)

Shibao S, Akiyama T, Ozawa H, Tomita T, Ogawa K, Yoshida K. Descending musculospinal branch of the ascending pharyngeal artery as a feeder of carotid body tumors: angio-architecture and embryological consideration. J Neuroradiol. 2018 Nov 10. pii: S0150-9861(18)30241-4. doi: 10.1016/j.neurad.2018.10.002. [Epub ahead of print] PubMed PMID: 30423383.

Effendi K, Magro E, Gentric JC, Darsaut TE, Raymond J, Seizeur R, Bojanowski MW. Anastomosis Between the Ascending Pharyngeal Artery and the Posterior Inferior Cerebellar Artery Through the Jugular Foramen: A Cadaveric Observation. Neurosurgery. 2015 Nov 3. [Epub ahead of print] PubMed PMID: 26540355.

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