



An Aberrant branch of Hypoglossal Nerve-A Rare Anatomical Variation

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ABSTRACT:

Introduction: Hypoglossal nerve is formed from the hypoglossal nucleus situated in the medulla oblongata. It leaves the medulla through the anterolateral sulcus. It carries general somatic efferent fibres that means purely motor in nature. Landmark of the nerve is of paramount importance to avoid the damage during neck surgeries. Variations in the extracranial course may lead to the iatrogenic injuries to the important structures related to it. In our case, we found an aberrant branch from the hypoglossal nerve.

Conclusion: Very few cases are reported of an aberrant hypoglossal nerve. Therefore, finding such rare cases is helpful for the surgeon before the operative procedures in the region to prevent serious injuries leading to neurological deficits

KEY WORDS: cervical plexus, hypoglossal nerve, retrostyloid space.

INTRODUCTION

Hypoglossal nerve is formed from the hypoglossal nucleus situated in the medulla oblongata. It leaves the medulla through the anterolateral sulcus. It carries general somatic efferent fibres that means it is purely motor in nature. It is composed of a total of 12 rootlets which then get united to form one single trunk. After its formation the trunk takes its exit from the hypoglossal canal which is also known as the anterior condylar canal of the posterior cranial fossa. It then enters the retrostyloid space. Retrostyloid space is also called lateral pharyngeal space. It runs forward and after a distance of 2cm it is joined by the cervical plexus. At this moment, the hypoglossal nerve is closely related to the internal carotid artery, internal jugular vein, glossopharyngeal nerve, vagus nerve and the spinal accessory nerve. The cervical plexus carries fibres from the C1 and C2 spinal nerves. These spinal nerves actually use the hypoglossal nerve to reach the strap muscles to supply them in the form of Ansa cervicalis. The nerve descends downward through the lateral pharyngeal space, medial to the internal carotid artery. Maintaining this same relation it reaches the occipital branch of the external carotid artery and then it becomes horizontal and turns around the sternocleidomastoid branch of the occipital artery thereafter it courses towards the tongue. There it first crosses the carotid triangle, then it crosses over the digastric triangle. In the digastric triangle it goes deeper to the posterior belly and intermediate tendon of digastric muscle. Here it lies over the hyoglossus muscle, crosses the greater cornua of hyoid bone in the Pirogov triangle deep to the submandibular gland. It is then related inferior to lingual nerve. Between the hyoglossus and mylohyoid muscle it terminates into the terminal branches. It mainly has a meningeal branch which supplies the dura mater, as it contributes as descendens hypoglossi it supplies the strap muscles of neck, terminal lingual branches supply the intrinsic and extrinsic muscles of tongue along with geniohyoid. Landmark of the nerve is of paramount importance to avoid the damage during neck surgeries. Variations in the extracranial course may lead to the iatrogenic injuries to the important structures related to it. In our case, we found an aberrant branch from the hypoglossal nerve.

CASE REPORT:

We found this variation in one male cadaver among 10 cadavers and 20 sides on the right side. Dissection has been performed as a process of routine dissection session during the teaching session. All the steps of dissection have been followed meticulously following the steps from Cunningham practical manual of anatomy. The cadavers were fixed in formalin. The dissection on the neck region was done to visualise the triangles of the neck. First of all, we reflected the skin, superficial fascia along with the platysma, the investing layer of deep cervical fascia, cervical group of lymph nodes, level I and level II. Now in the anterior triangle, all the boundaries and contents were well preserved. No structure got damaged during neck dissection. Interestingly we found that an aberrant branch is derived from the hypoglossal nerve from the deeper side of intermediate tendon of digastric muscle In Front of

the internal carotid artery and common carotid artery, then it crosses the internal jugular vein superficially and then it runs laterally and reaches the sternocleidomastoid muscle and terminates within the substance of the muscle.

PICTURES

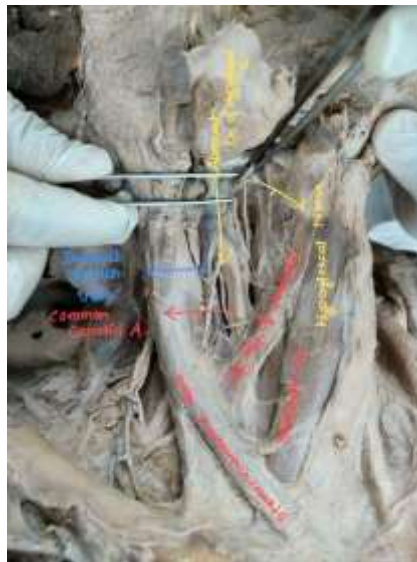


Figure I: Aberrant branch from hypoglossal Nerve.

DISCUSSION

We review that the anatomical variations related to this nerve carries paramount importance. Injury to this nerve leads to multiple diseases and can also lead to paresis. As this nerve is closely related to the important structures, it is very important to understand the topography or any variation in the morphology of the nerve during neurosurgery, vascular surgeries or any other neck surgeries. Furthermore, presence of any tumour or head injury leads to paresis in frequent cases Manoli A et al (2019)¹.

DD Kim et al (2003)² reported a case where they found unilateral aberrant hypoglossal nerve passing In Front and lateral to internal jugular vein.

Islam S et al (2013)³ reported an intraoperative aberrant hypoglossal nerve. They encountered this case during facial reanimation procedures.

Aruede G et (2021)⁴ reported a case where they found intraoperative nerve like structure crossing the internal jugular vein superficially while performing a surgery on a Cancer patient. Later they documented the case as unilateral aberrant hypoglossal nerve on the left side. The patient recovered after few days. Therefore, knowledge of such variation is useful for the surgeon.

The embryological basis innervation of the hypoglossal nerve, the 4 occipital myotomes, grows towards the tongue in the form of hypoglossal cord prior to hypoglossal nerve. As the tongue muscle develops from the occipital myotome which gets innervated by the nerve.

CONCLUSION

Very few cases are reported of an aberrant hypoglossal nerve. Therefore, finding such rare cases is helpful for the surgeon before the operative procedures in the region to prevent serious injuries leading to neurological deficits.

CONFLICTS

There is no conflict of the study to be reported.

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