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Case Report

Unilateral, double hypoglossal nerves leaving the cranial cavity through two hypoglossal foramina – a case report

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ABSTRACT

Hypoglossal nerve is the twelfth cranial nerve. It functionally and clinically important since it is supplies most of the muscles of the tongue. Here we report the doubling of the left hypoglossal nerve. The hypoglossal nerve of the left side had two roots which pierced the dura separately and entered two hypoglossal canals and reunited in the occipital bone and emerged out of the skull as a single hypoglossal nerve. Knowledge of this anatomical variation may be important to various fields of medicine. © **Neuroanatomy. 2008; 7: 6–7.**

Key words [variations] [hypoglossal nerve] [hypoglossal foramen] [cranial cavity] [cranial nerves]

Introduction

Hypoglossal nerve is the twelfth cranial nerve. Its fibers arise from the hypoglossal nucleus of the medulla oblongata and emerge out of the medulla between its pyramid and olive. The nerve passes anterolaterally in the posterior cranial fossa and leaves the cranial cavity through the hypoglossal foramen. The nerve passes through the carotid and digastric triangles of the neck. It enters the tongue by passing between anterior border of hyoglossus and genioglossus muscles. It supplies all the intrinsic and extrinsic muscles of tongue except palatoglossus muscle.

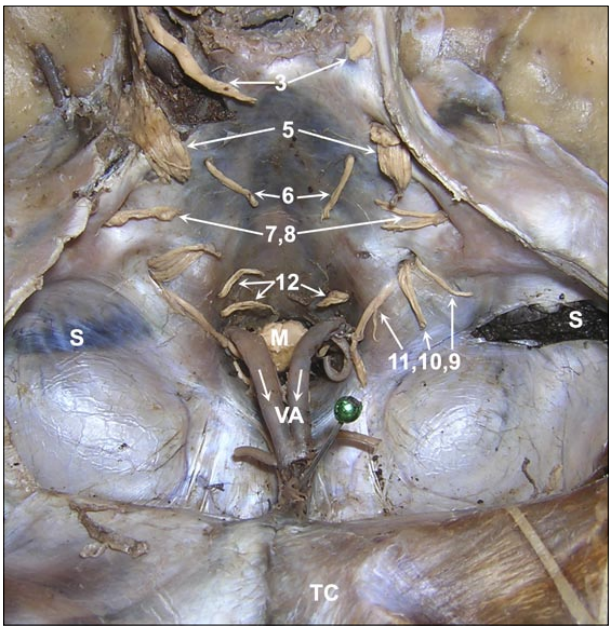
Case Report

In the present case, during routine dissection of cranial cavity for medical undergraduates, the left hypoglossal nerve was found have two roots in the cranial cavity (Fig. 1). This was found in a male cadaver approximately aged 60 years. The right hypoglossal nerve had a single trunk. The two roots of the left hypoglossal nerve pierced the dura separately and then entered the two hypoglossal canals separately. When they came out of the skull, they had already joined to form the single hypoglossal nerve trunk. The union of the two roots had occurred within the occipital bone. The extra cranial course and distribution of the nerve was normal. The two hypoglossal canals of the left side were separated from each other by a gap of about 0.5 cm. The two canals had joined to form one hypoglossal canal just before the exit of the nerve from the cranial cavity.

Discussion

Hypoglossal nerve shows a lot of variations in its course and branching in the extra cranial course; but variations in the cranial cavity are relatively rare. Bergman et al., [1] have reported several variations of hypoglossal nerve which include exit of the hypoglossal nerve from the posterior surface of medulla oblongata and formation of annulus around vertebral artery by its rootlets. Though there are many studies on extra cranial course and relations of the nerve, there are a very few studies on the intra cranial course and relations. One such study [2] on 32 cadavers showed the rootlets of the nerve emerging as a fan-shaped distribution in 23.44%, in two bundles in 76.56% and pierced the dura mater in two separate apertures in 76.57% of cases. In the same study, in 28.12% of cases, the hypoglossal canal was divided in two by a small bony spicule. The current case is a similar case where the nerve roots were separate till they entered the occipital bone and were a single trunk before they emerged out of the occipital bone. Recently a study was conducted on human and other mammalian species [3]. The hypoglossal canal was found to be present in all the skulls studied. The hypoglossal canal was double in 43% of the cases in this study.

The doubling of hypoglossal canal by a bony spicule is not a rare phenomenon. But it has been studied in most of the cases in dry skulls. The studies in a wet specimen with respect to the intracranial course and intra occipital course are very few. The nerve passing as two roots, into



the occipital bone and emerging out as one trunk may be of clinical importance. The nerve roots might get trapped during the ossification process in the occipital bone. If this happens unilaterally or bilaterally, may result in minor degrees of alterations in movements of the tongue. Though this might not produce any major problems in movements of the tongue, they are good enough to change the quality of the words pronounced by the individual. There are no clinical studies yet on the entrapment of the hypoglossal nerve in the occipital bone. It is worth considering this variation in elderly patients with minor difficulties in movements of tongue or speech.

Figure 1. Dissection of the posterior cranial fossa showing the cranial nerves leaving the cranial cavity through their respective foramina. Color version of figure is available online. *(**3:** oculomotor nerves; **5:** trigeminal nerves; **6:** abducent nerves; **7,8:** facial and vestibulocochlear nerves; **11,10,9:** accessory, glossopharyngeal, and vagus nerves; **12:** hypoglossal nerves [doubled on the left side]; **S:** sigmoid sinuses; **M:** medulla oblongata; **VA:** vertebral arteries; **TC:** tentorium cerebelli)*

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