Editorial Note

Morphometric study of the hypoglossal canal

Context: The knowledge of hypoglossal canal (HC) and its normal variants is important for neurological procedures around the craniovertebral junction. The aim of this study was to characterize the morphometric parameters of the HC in our environment.

Materials and methods: One hundred and twenty four HCs were studied. The following variables were studied: presence of septation, position of the HC in relation to the occipital condyle (OC), length of HC (LHC), diameter of the intracranial orifice of the HC (DI), diameter of the extracranial orifice of HC (DE), distances from intracranial end of HC to the anterior end (OC-iHC1), inferior end (OC-iHC2) and posterior end (OC-iHC3) of OC.

Results: Absence of septation was more (85.3%) than presence of it (14.7%). HC was related to the anterior, middle and posterior third of the OC in 78.7%, 17.2% and 4.1% of the cases respectively. Mean (mm) values of variable include: LHC (11.40±1.62), DI (7.04±1.33), DE (6.55±1.85), OC-iHC1 (10.78±1.95), OC-iHC2 (11.16±2.21) and OC-iHC3 (10.84±2.55).

Conclusion: Majority of the HCs is located in close relation with the anterior third of the OC, and has absence of septation.

Hypoglossal canal (HC) is important to Anatomists, anthropologists, forensic experts and neurosurgeons. Lesions involving the HC include hypolossal nerve schwannomas, posterior cranial fossa meningiomas and juguo-tympanic paragangliomas. These lesions though uncommon and usually benign, pose great challenge to neurosurgeons because of difficulty in gaining access to the anterior and lateral part of occipitovertebral junction. With advancement of technology, transcondylar approach (TCA) is gaining popularity; a procedure which includes drilling of the posterior part of the occipital condyle. This procedure poses a threat to the HC and its contents, and therefore demands detailed knowledge of the morphometry of the HC, its contents and variations.

Hypoglossal canal transmits the hypoglossal nerve, a meningeal branch of ascending pharyngeal artery and an emissary vein from the basilar plexus. Septation is one of the normal variables of the HC. It may be partial or complete. When it is complete there is double HC. This may cause non united trunks of the hypoglossal nerve to travel separately through the HC.[6] Septation has some clinical significance. Presence of septation may narrow the lumen of the HC and may cause compression of the traversing structures. Venous compression produces symptoms earlier than nerve compression.

From the present study, absence of septation was more prevalent (85.3%) than presence of it (14.7%). Among the HCs with presence of septation, incomplete and complete septations were 9% and 5.7% respectively. Complete septation was more prevalent on the left side than on the right side; the opposite was the case for incomplete septation. Reported 26% and 0% for incomplete and complete septation respectively. They also found out that incomplete septation may be found near the internal opening, midway or the external opening of the HC reported that the prevalence of complete septation of HC was 16%, which is higher than that of the present study. Much higher value (28%) was reported by with 3% of the skulls having bilateral HC reported presence of double HC in 21% and 33% of the total number of HC studied. Another study reported incidence of double HC to be 20%. These differences may be due to racial factor.

Limitations of the study

The bones were dry and retracted; thus the metric parameters in our study may not be true

representative of what the measurements would be in living individuals.

Conclusion

The present study has established the morphometric parameters in dry skulls in our locality. It has also established the existence of variations in the morphometrics of HC. There was absence of septation in majority of the HCs and the diameters of the intra cranial and extra cranial orifices correlated with each other. Majority of the HCs are located in relation to the anterior third of the OC. The knowledge of these variations is very helpful in planning for surgery around cranial base.

Stay Safe & Healthy…!

Thank you!

With kind regards,

Jervas Ukoha
International Journal of Anatomical Variations