

Original Article

Morphometric analysis of posterior cranial fossa and surgical implications

ABSTRACT

Background: Posterior cranial fossa (PCF) is an important area in terms of anatomy and surgery. It is a common site of many neoplastic, vascular, and degenerative lesions. Craniovertebral surgeries require special attention regarding detailed information about the morphology and morphometry of this region. The aim of this study was to analyze the morphometric characteristics of PCF and distances between the inner base of the skull.

Materials and Methods: An observational, retrospective cross-sectional study was made. Fifty-five dry human skulls of unknown sex were measured ascertained using digital Vernier caliper with 0.01 mm precision.

Results: The morphometric analysis of the mean length and width of the FM was 34.51 mm and 29.85 mm, respectively. We found a significant difference ($P < 0.05$) among the distance between the posterior tip of occipital condyle and basion of the right and left sides.

Conclusion: According to our observations, the present study yielded detailed morphometry of the PCF and neurovascular relationship. It can facilitate successful instrumentation and minimize neurovascular injuries. Furthermore, it provides safe and suitable data for guiding neurosurgical procedures. The major limitation of this study was the lack of knowledge regarding the age and gender of the participants whose skull base was studied.

Keywords: Cranial morphometry, neuroanatomy, occipital condyle, posterior cranial fossa

INTRODUCTION

The posterior cranial fossa (PCF) is an important area in terms of anatomy and surgery. It is a common site of many neoplastic, vascular, and degenerative lesions.^[1] Various neural structures are in close vicinity to this area, like IX to XII cranial nerves, C1 and C2 spinal nerves, caudal aspect of the medulla oblongata, rostral aspect of the spinal cord, inferior vermis, and tonsil of the cerebellum. In addition, vascular structures such as vertebral, cerebellar, meningeal arteries, dural venous sinuses, and internal jugular vein are also closely associated with it.^[2,3]

Lateral approaches to the foramen magnum (FM) are frequently used to treat lesions located anteriorly to the brain stem and at the craniocervical junction (CCJ).^[4] The occipital condyle (OC) represents the cranial portion of the cranial vertebral junction. Each OC is oriented obliquely, so that its anterior end lies closer

to the midline. The OC is related to the hypoglossal canal directed laterally and slightly forwards, jugular foramen (JF) and internal auditory canal (IAC) is lateral to each condyle.

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