ORIGINAL ARTICLE

A Study of Morphology of Posterior Condylar Foramen and Its Anatomical Variations in Dry Pakistani Adult Skulls

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ABSTRACT

Background: The exact anatomical location of condylar canal is on norma basalis just posterior to the condyles of occipital bone. Condylar emissary vein running along its path ensures patency of this passage.
Aim: To assess normal location and variability in posterior condylar foramen (PCF}.
MethodS: This research work was conducted on 69 cadaveric skulls of human beings obtained from Anatomy Departments, King Edward Medical University, Fatima Jinnah Medical College, Postgraduate Medical Institute/Amerudin Medical College, Sahiwal Medical College.
Results: We found posterior condylar foramina on either side of miline in 18%, and on one side posterior condylar foramina were found in 14% while the total incidence was 33% of observed skulls. In 17% posterior condylar foramina was present within the sinus while in 8% posterior condylar foramina was found located on the back of sinus out of the 69 skulls examined in current research work.
Conclusion: Present research work provides fundamental information to the practicing physicians and surgical specialists prior to operative work on norma basalis in the vicinity of condyls of occipital bone. Adequate management of dural arteriovenous fistula is dependent on exact knowledge of anatomy of posterior condylar foramina.
Keywords: "Posterior condylar canal, bilateral, unilateral, variations".

INTRODUCTION

Hypoglossal canal or condylar canal in located in anterior part of the occipital condyle. There is a depression located just behind occipital condyle1and is called posterior condylar fossa. This depression located just behind occipital condyle accommodates the first cervicle atlas vertebra during the atlanto-occipital joint movements. This depression or fossa may be is characterized by a foramen, also called the posterior condylar canal[1,2,3]. By far this posterior condylar foramen is the biggest emissary foramen of the posterior cranial fossa. Condylar canal is present behind and on lower aspect of to the jugular foramen and posterior to the hypoglossal canal. Condylar canal transmits an emissary vein to the sigmoid sinus and also nerves which supply the duramater of the posterior cranial fossah[4,5]. Emissary vein to the sigmoid sinus is also called as the posterior condylar vein that unites the veins located within the suboccipital triangle with those of the sigmoid sinus[6,7]. Meningeal branches of the occipital artery also course through posterior condylar canal. This anatomical information is of vital significance to surgeons doing operative work on base of skull to avoid damage to the neurovascular structures[8,9]. The condylar veins can be used as access routes to hypoglossal dural arteriovenous fistulas. The surgical anatomy of posterior condylar foramina is of real importance during the management of clinical settings involving treatment of dural arteriovenous fistula.

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MATERIALS AND METHODS

This study was conducted on 69 dry adult skulls gathered from the departments of anatomy, King Edward Medical University, Fatima Jinnah Medical College, Postgraduate Medical Institute/Amerudin Medical College, and Sahiwal Medical College Sahiwal, to observe weather posterior condylar canal is located on one sided or two sides of midline. Furthermore to study the morphologic anatomy of posterior condylar canal and its variations. Protocol of current study was the presence of complete condylar foramina behind occipital condyles as variation for the present study. Methodology included passing a probe into the posterior condylar foramina to observe

their patency and also to understand their connection with posterior cranial fossae.

RESULTS

Posterior condylar foramina were investigated in 69 cadaveric skulls. Current research showed incidence of presence of posterior condylar foramina as 33% amongst which we found bilaterally locatedposterior condylar foramina in 18%, and Type Bilateral (18%) Unilateral (14%) unilateral in another 14%. Intrasinus form of posterior condylar foramina was in 17% and retrosinus form in 8% of the total skulls observed in our study.

Table 1: Location of PCF in cadaveric.

Variety	Bilateral (18%)	One side (14%)
	Right	Opposite side
Posterior condylar foramen	15	7

Table 2: Percentage of location of PCF in relation with sigmoid sinus

Type	Intraspinus	17%	Retrospinus	8%
	Right	Left	Right	Left
Posterior Condylar Foramen	12	5	4	

DISCUSSION

Within posterior cranial fossa, the normal location of opening of posterior condylar canal is at or near to the groove for sigmoid sinus, behind and away to the jugular foramen. More importantly anomalous foramina, when present, also open at the same sites within the posterior cranial fossa[10].

Fig. 1: Posterior condylar foramen bilateral location probed documented.

Fig. 2: Bilateral posterior condylar foramina.

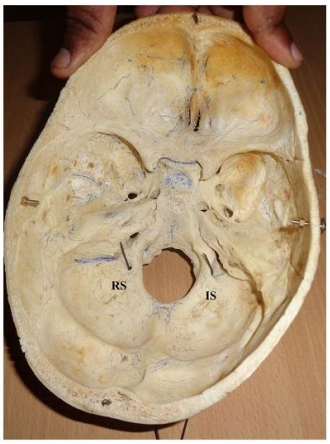
Variations are law of nature and significant variations have been observed in cerebral venous return into systemic veins[11]. This has been a priority research topic of modern time in anatomical circles. This is pertinent to mention here that these anomalous foramina might be acting as additional source of drainage of the intracranial veins into extracranial veins. Ginsberg observed the posterior condylar canal to be bilateral in 55.9% of his study work and was located unilaterally in17.6%[7].

In a research work performed by Boyd, posterior condylar canal was observe the posterior condylar canal with an incidence of 77% unilaterally[8].

Fig. 3: Unilateral posterior condylar foramina.

Galarza et al. in their study documented posterior condylar foramina of intrasinusal form in 24.6% of cases bilaterally, in which 17.8% were on the right side and 13.5% were found to be on the opposite location, whereas the type in which it present behind the sinus, the posterior condylar foramina was found in 1.2% of both sides and 1.2% observed on the right side[9].

Fig. 4: Posterior condylar foramen in relation with sigmoid sinus, retrosinus type on left side and intrasinus form found on right side.



Krause discovered that condylar canal was found on both sides in 21% and on one side only in 38%.[10] In our study, of the 69 human dry skulls, we observed posterior condylar foramina The incidence of posterior condylar foramina was 33%, on two sides in 18%, and on one side in 14%. The type of posterior condylar foramina present within sinus, was depicted in 17% and variety present behind sinus in 8% of the 69 skulls documented in current research work (Fig. 1,2,3).

The results of our study parallel with previous research. Our recently established Sahiwal Medical College Sahiwal h, so current work involved less number of skulls.

CONCLUSION

Current research work provides fundamental information the clinicians, radiologists, anatomists and surgeons prior to operative procedures involving base of skull.

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