

# Anomalous Shapes of Jugular Foramen in Dried Skulls - Anatomical Basis of Vernet's Syndrome

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## ABSTRACT

Jugular foramen is seen at the base of the skull behind the carotid canal. It transmits 9,10,11 cranial nerves and internal jugular vein. Variations in the shape of the jugular foramen may compress these vital structures. The present study was done to determine the anomalous shapes of jugular foramen in dried skulls. When the dried skulls from the department of Anatomy at a private medical college were observed, two skulls were found to show anomalies in their shapes bilaterally. One skull exhibited a complete partition on left side dividing the foramen into two. Another skull was found to have incomplete partitions to such an extent that they could compress the vital structures passing through them. Vernet's syndrome- a jugular foramen syndrome may be due to inappropriate bone growth leading to partition or anomalous shape of the jugular foramen. The present study demonstrates two dried skulls with anomalous shapes and partition of the jugular foramen.

**KEYWORDS:** Jugular foramen, Vernet's syndrome, partitions, dried skulls

## INTRODUCTION

Examination of interior of dried skulls and their clinical correlation is very much useful to understand the etiopathogenesis of various syndromes. Jugular foramen is a crucial entity in the posterior cranial fossa transmitting the most important 9,10,11 cranial nerves and internal jugular vein. The jugular foramen can be considered as a hiatus between temporal and occipital bone. Gray's anatomy<sup>(1)</sup> describes a jugular foramen as being located in posterior cranial fossa at the posterior end of petro-occipital suture. The study by Hussain et al<sup>(2)</sup> on jugular foramen and jugular fossa revealed that they show bilateral variations. Surrock's<sup>(3)</sup> research on Nigerian skulls reported only 8% were almost same bilaterally. As the jugular foramen exhibit variations, it may be the anatomical cause for Vernet's syndrome where the patient presents with dysphonia, dysphagia, loss of gag reflex, sternomastoid, trapezius paresis etc may be due to a cholesteatoma as reported by Erol et al<sup>(4)</sup>. The anatomical basis of jugular foramen variations and partitions is a key point for neurosurgeons, radiologists, neurologists, otorhinologists to arrive at the diagnosis. The present study has been done to report the occurrence of variation and partition in the jugular foramen.

## MATERIALS & METHODS

Dried skulls from the department of Anatomy were studied routinely. Two skulls were found to have variable shapes

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and partitions in jugular foramen. These were thoroughly examined from the interior of the skull viewing the posterior cranial fossa. Photographs were taken from different angles to show the anomalies.

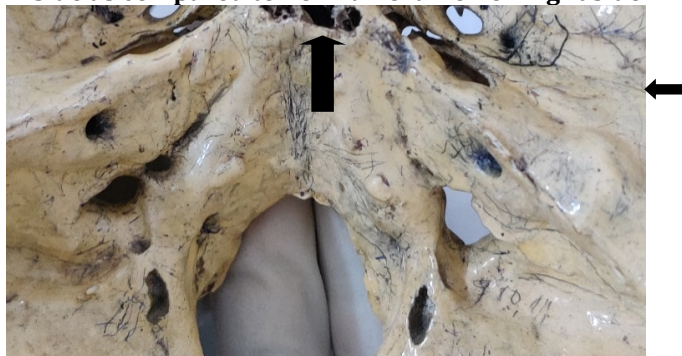
## RESULTS

The following pictures show anomalies in the jugular foramen in two dried skulls.

**Fig 1: Incomplete partition of jugular foramen on the left side, variable bone growth into the foramen on the right side**



**Fig 2: Complete partition of jugular foramen on left side as compared to normal foramen on right side.**



### DISCUSSION

The jugular foramen is not only a complicated entity for surgical approach but also it transmits vital structures like 9,10,11 cranial nerves and internal jugular vein. The size and shape of the foramen may be determined by the anatomical morphology of internal jugular vein. A study by Hatilboglu and Anil<sup>(5)</sup> on Anatolian skulls reported unequal sized jugular foramina on both sides. Ekinci et al<sup>(6)</sup> observed a higher incidence of 61.4%. Wyoscki et al<sup>(7)</sup> described the asymmetry between right and left foramina. Though the literature was less on Indian studies, Patel and Singel<sup>(8)</sup> reported bilateral variations in jugular foramina and fossae as well. Another study by Sethi et al<sup>(9)</sup> concluded that the jugular foramen was larger on the right side in 53.5% skulls and on the left side in 7.1% skulls. The anatomical variations in jugular foramen forms the basis of Vernet's syndrome or jugular foramen syndrome as described by Robbins et al<sup>(10)</sup>. The present study reports the occurrence of anomalies in the jugular foramen in two dried skulls. One skull exhibited an incomplete partition on one side with irregular bone growth into the foramen on the other side. The second skull showed a complete partition where the foramen is divided into two.

### CONCLUSION

Jugular foramen of two dried skulls showed incomplete and complete partition on left side and an irregular bone growth into the foramen on right side in one skull.

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