



A Morphological Study of Jugular Foramen in Dry Skull

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ABSTRACT

Jugular foramen of human skull is one of the most interesting foramina. AIM: The present study was done to examine and assess the length and width of jugular foramen. MATERIALS & METHODS: The study was conducted on 30 dried skulls from department of anatomy, A.C.S medical college, Chennai. The jugular foramen was observed by naked eye, 60 jugular foramina both right and left side of skull was measured using divider and scale. RESULTS: The mean width of right and the left sides were 9.5mm and 8.2mm respectively. The mean length of right and left sides were 15.12mm and 14.12mm respectively.

KEYWORDS : SKULL, JUGULAR FORAMEN, MEASUREMENTS

INTRODUCTION

The jugular foramen is a paired large complex bony canal, found in posterior cranial fossa. It is formed by the occipital bone postero-medially and the petrous part of temporal bone anterolaterally. The foramen is located in the cranial base laterally and anteriorly related to the foramen magnum. The foramen is elongated and irregular in shape. It varies in size and shape from side to side in same cranium. It is the essential and chief route for the venous outflow from the skull. The internal jugular vein passes through the foramen. Along with the vein glossopharyngeal (IX), vagus(X) and cranial part of accessory nerve (XI), meningeal branches of occipital artery, ascending pharyngeal artery also pass through the foramen. The neural and vascular components pass through this foramen is more important. The jugular foramen was a subject of many morphological studies because of its clinical significance. It can be affected by congenital, vascular and tumoral lesions which manifest in various clinical syndromes. Most of the approaches for skull base surgeries are designed to drill the bone around the jugular foramen for proper exposure. Therefore, an understanding and detailed knowledge about the foramen is necessary for the radiologist, anthropologist and neurosurgeons. Morphological studies of the jugular foramen were focused on measuring its antero-posterior (length), mediolateral (width) diameter.

MATERIALS AND METHODS

The study was conducted on 30 dried skulls from department of anatomy, A.C.S medical college, Chennai. The length and width of 60 jugular foramina both right and left side of skull was measured using divider and scale.

RESULTS

The mean width of right and the left sides were 9.5mm and 8.2 mm

respectively. The mean length of right and left sides were 15.2mm and 14.2mm respectively. The measurements were tabulated.



PICTURE: 1



PICTURE: 2

TABLE: 1

S.NO	PARAMETERS	RIGHT MEAN (mm)	RANGE (mm)	LEFT MEAN (mm)	RANGE (mm)
1.	LENGTH	15.2	10.5-20.5	14.2	10.0 - 17.2
2.	WIDTH	9.5	6.0 - 14.5	8.2	6.0 -10.5

DISCUSSION

The jugular foramen is difficult to understand and to access surgically, because of its deep position. The size of the jugular foramen is associated with the size of internal jugular vein. The difference in size of two internal jugular veins is already visible in human embryo. Tumors involving jugular foramen and nearby structures requires microsurgical approach to enter into this region. Hence a detailed knowledge of the jugular foramen is needed to all the neurosurgeons while doing the surgery in this region. The picture: 1 shows a probe passing through jugular foramen. The picture: 2 show the closer view of jugular foramen. The measurements were given in Table 1. The mean length of the right side foramen is about 15.2mm shown. The length on right side ranges from 10.5mm to 20.5mm. The mean length of left side foramen is 14.2mm. The width on right side ranges from 10.0mm to 17.2 mm. The mean width of right side foramen is 9.5mm. The width of right side ranges from 6.0mm to 14.5mm. The mean width of left side foramen is 8.2mm. The width of left side ranges from 6.0mm to 10.5mm. From the above results it is found that the right side foramen is larger than the left jugular foramen. Similar studies were carried in various regions and race across the world. The value of length and width of jugular foramen differed with Brazilian and Nigerian population. Osunwoke et al., Idowu, found the mean length of right and left jugular foramen as 13.90, 14.11mm respectively, while the mean width of right and left jugular foramen was 11.22, 16.52mm. Ayeni et al showed that 70% of right side jugular foramina were wider than the left side. Kumar et al showed that in 64.7% of cases the right jugular foramen is larger. In 19.1% of cases the left foramina were larger. In all above studies the jugular foramen was larger on the right side of skull than on the left side.

CONCLUSION

In comparison with the previous studies the length of the jugular foramen is slightly higher whereas the width is slightly lower. Since knowledge of size of jugular foramen seems to be important, for anatomical studies at assessing normal and pathological variation of basicranial foramina and their relationship with the venous system of the skull. Results of this study will help the neurosurgeons and radiologists in their clinical practice and during surgery in this region.

REFERENCES

1. Pereira GA, Lopes PT, Santos AM. Morphometric aspects of the jugular foramen in dry skulls of adult individuals in southern Brazil. *Journal of Morphological Sciences.* 2010;27:3-5
2. Vijjisha P, Bilodi AK, Lokeshmaran. Morphometric study of jugular foramen in Tamil Nadu region. *National journal of clinical anatomy .* 2013;2:71-4.
3. Idowu OE. The jugular foramen – a morphometric study. *Folia Morphologica (Warszawa)* 2004;63:419-22
4. Osunwoke EA, Oladipo GS, Gwunireama IU, Ngaokere JO. Morphometric analysis of

- foramen magnum and jugular foramen in adult skulls in southern Nigerian population. *American Journal of science and Industrial Research.* 2012;3:446-8.
5. Singla A, Sahni D, Aggarwal A, Gupta T, Kaur H. Morphometric study of jugular foramen in north west Indian population. *Journal Postgraduate Medicine Education and Research.* 2012;46:165-71
6. Sahib HS, Mavishetter GF, Thomas ST, Prasanna LC, Muralidhar PA. Morphometric study of jugular foramen in human adults of south India. *Journal of Biomedical science and Research.* 2010;2:240-243
7. Kumar A., Akhtar J., Kumar A: Variation in jugular foramen of human skull. *Asian journal of medical sciences.* 2015;6:95-98