

# Partial obstruction of jugular foramen by abnormal bone growth at jugular fossa

S Nayak

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## Abstract

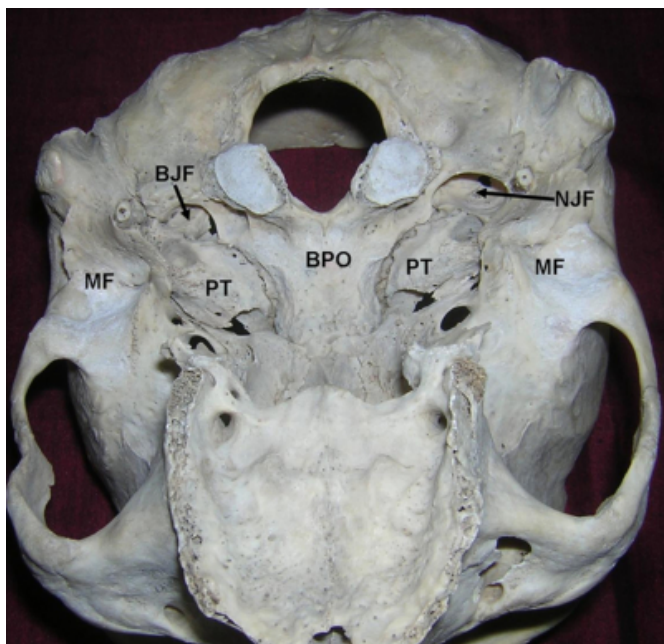
An abnormal unilateral, partial blockage of the jugular foramen was noted in a skull during osteology demonstration classes for the medical undergraduates. The left jugular foramen was narrowed by a thick bony projection. This bony projection filled the jugular fossa. This kind narrowing of the foramen might result in neurovascular symptoms as it transmits important cranial nerves and internal jugular vein.

## CASE REPORT

During osteology demonstration classes for medical undergraduates, an abnormal bony projection was found in the left jugular fossa of a skull (Figs 1 and 2). On the right side the jugular fossa was normal. Presence of the abnormal bony projection resulted in partial blockage of the jugular foramen. The jugular foramen was reduced to less than half of its size when compared with the right jugular foramen. There were no other abnormalities in the skull.

### Figure 1

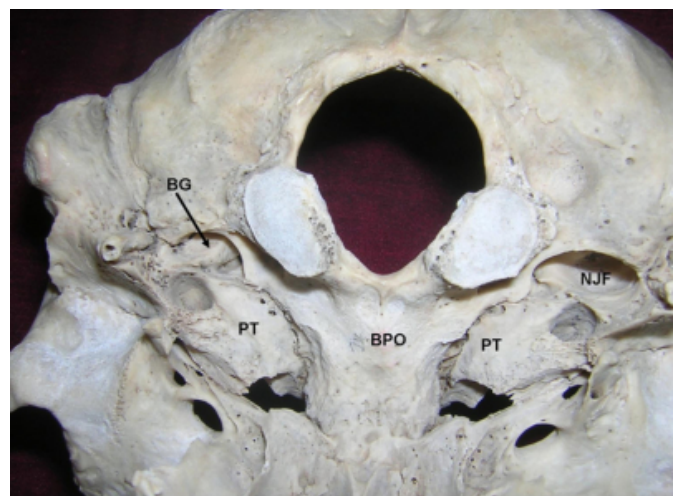
Figure 1: Skull base showing the abnormal bone growth in the jugular fossa.



(NJF – normal jugular fossa; BJF – blocked jugular fossa; BPO – basilar part of the occipital bone; PT- petrous part of the temporal; MF – mandibular foramen)

### Figure 2

Figure 2: Posterior part of the skull base showing the abnormal bone growth in the jugular fossa.



(NJF – normal jugular fossa; BG – bone growth in jugular fossa; BPO – basilar part of the occipital bone; PT- petrous part of the temporal)

## DISCUSSION

The jugular foramen is one of the important foramina of the skull. It transmits the sigmoid sinus, inferior petrosal sinus, ninth, tenth and eleventh cranial nerves. The jugular fossa lies just outside the jugular foramen and lodges the superior bulb of the internal jugular vein. The jugular foramen may

be divided into three parts by four bony spicules. In such cases, the anterior part transmits the inferior petrosal sinus, middle part transmits the three cranial nerves and the posterior part transmits the sigmoid sinus. The jugular foramen may also be divided into two parts by intrajugular processes<sup>1</sup>. In a study on 300 skulls of 17<sup>th</sup> and 18<sup>th</sup> century<sup>2</sup>, the jugular foramen was larger on the right in 61.6% and was larger on the left in 26% of cases, with the remainder being of almost equal size. A dome caused by a superior jugular bulb (jugular fossa) was present bilaterally in 49%, on the right only in 36%, on the left only in 6%; it was absent bilaterally in 10.3%. Complete bony septation occurred in 5.6% on the right and in 4.3% on the left, partial septation was observed in 2.6% on the right and in 19.6% on the left. In a study conducted on 134 East Asian Indian skulls<sup>3</sup>, there was a bridging of jugular foramen in 8.1% of cases.

A bony growth in relation to jugular foramen has not been reported yet. The bony growth presented here markedly reduced the size of jugular foramen and jugular fossa. It might cause the neurovascular symptoms which can mimic the symptoms caused by jugular meningiomas, glomus jugulare tumors or cholesteatoma. The bony growth in the

jugular fossa region might compress the superior bulb of internal jugular vein which in turn might result in venous congestion in the cranial cavity. The compression of 9<sup>th</sup> 10<sup>th</sup> and 11<sup>th</sup> nerves might result in paralysis of pharynx, larynx and palate. This variation may lead to wrong diagnosis clinically. The knowledge of this abnormality may be important for neurologists, radiologists and anthropologists.

## **CORRESPONDENCE TO**

Dr. Satheesha Nayak B. Associate Professor of Anatomy  
Melaka Manipal Medical College (Manipal Campus)  
International Centre for Health Sciences Madhav Nagar,  
Manipal Udipi District Karnataka State, INDIA. 576104  
Email: nayaksathish@yahoo.com Phone: 91 820 2922519,  
91 9844009059

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**Author Information**

**Satheesha Nayak**

Associate Professor of Anatomy, Melaka Manipal Medical College (Manipal Campus), International Centre for Health Sciences