

Carotid Artery Syndrome Associated with Anomalies of Middle Cranial Fossa Foramina Encountered in a Dried Human Skull

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ABSTRACT

Intracranial course of the internal carotid artery is complicated where the lacerum segment and cavernous segment are prone for compression due to anatomical variations in the middle cranial fossa. The present study reports anomalies encountered in middle cranial fossa which may lead to carotid artery syndrome. On routine examination of dried human skulls from the department of Anatomy, one skull was found to have anomalies in the middle cranial fossa. The foramen ovale was incomplete on right side and was found to be merged with incomplete foramen spinosum and both foramina were communicating with foramen lacerum. On the left side in the middle cranial fossa, a caroticoclinoid foramen was observed with ossification of carotico clinoid ligament. These entities may lead to carotid artery syndrome and other neurological complications. Carotico clinoid foramen and ossified carotico clinoid ligament may be congenital leading to ischemia or hemorrhagic changes in the brain due to carotid artery syndrome. Excision of carotico clinoid ligament could be the treatment in such cases. Hence, knowledge regarding the anatomical anomalies in the middle cranial fossa is of paramount importance to the neurosurgeons and radiologists in dealing with such rare syndromes. The present study reports anomalies in the middle cranial fossa encountered in a dried human skull.

KEYWORD: Carotid artery syndrome, incomplete foramen ovale, foramen spinosum, carotico clinoid foramen

INTRODUCTION

Middle cranial fossa is mainly formed by sphenoid bone which bears important foraminae that give way to vital nerves and vessels. Internal carotid artery is classified by Bouthillier⁽¹⁾ into seven segments where the lacerum and cavernous segments occupy middle cranial fossa. Foramen lacerum transmits internal carotid artery which is elaborated by Tauber⁽²⁾. Mandibular nerve passes through foramen ovale as one of its contents and middle meningeal artery courses through foramen spinosum. Ossification of interclinoid ligament that connects the anterior and posterior clinoid processes is termed as interclinoid osseous bridge or sella turcica Bridge⁽³⁾. The internal carotid artery may be compressed while passing through this leading to carotid artery compression syndrome. Ozdogmus⁽⁴⁾ described about the carotid artery syndrome in their study. Though few studies were available in the literature, a combination of anomalies of carotico clinoid ligament and foramen ovale and spinosum has not been reported to the best of author's knowledge. The present study reports an anomalous human dried skull with a combination of variations bilaterally in the middle cranial fossa.

MATERIALS & METHODS

On routine examination of human dried skulls while teaching for the undergraduates in a private medical college, one skull was found to show the combination of anomalies in the

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middle cranial fossa. The photographs were taken in different angles and thoroughly examined.

RESULTS

Fig 1: Incomplete foramen ovale on right side merging with incomplete foramen spinosum, both opening into foramen lacerum; normal foramen ovale on right side

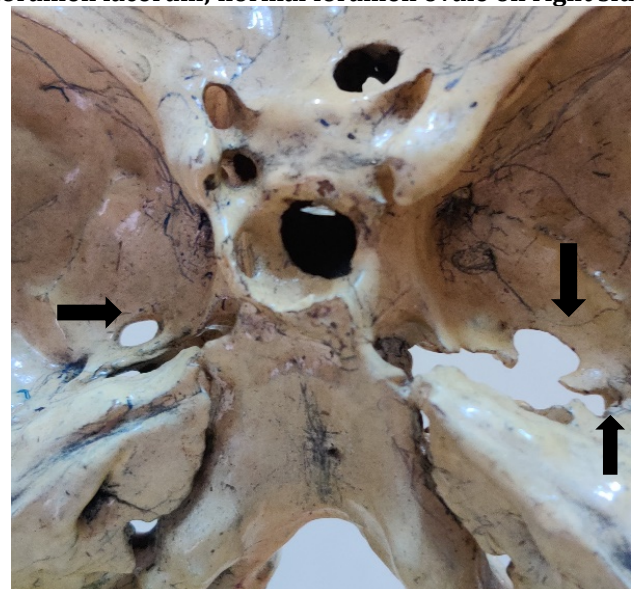
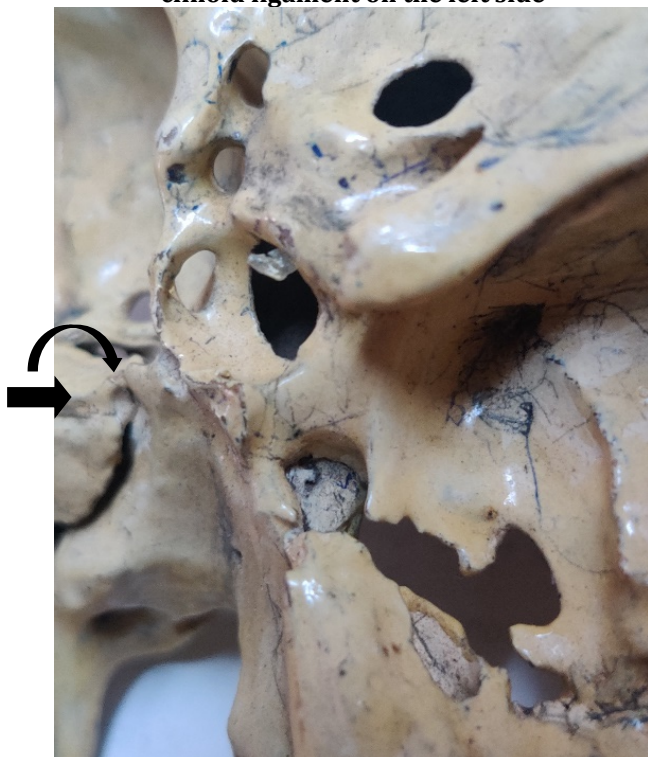


Fig 2: carotico clinoid foramen, ossified carotico clinoid ligament on the left side



DISCUSSION

Middle cranial fossae lodge important foramina that transmit vital nerves and vessels. Foramen ovale and spinosum of the sphenoid bone are located in the middle cranial fossa. Khairnar⁽⁵⁾ et al made research on different shapes of foramen ovale and spinosum. Carotico clinoid foramen and ligament of middle cranial fossa is also a part of sphenoid bone. The internal carotid artery is closely related to all these structures. A study by Gupta et al⁽⁶⁾ emphasized on the carotico clinoid foramina of Nepal region. Huynh et al⁽⁷⁾ described the careful approach while operating at the carotico clinoid ligament. The literature is scanty on the middle cranial fossa anomalies in human dried skulls. The present study depicts the middle cranial fossa anomalies seen bilaterally in a human dried skull. On the left side, carotico clinoid foramen and sella turcica bridge has been observed. On the right side, incomplete foramen ovale merging with foramen spinosum and lacerum has been

detected. These anomalies may form an etiology for carotid artery compression syndrome.

CONCLUSION

A human dried skull was observed to have open foramen ovale communicating with foramen spinosum and foramen lacerum on the right side and carotico clinoid ligament and foramen on the left side.

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