



INCIDENCE, NUMBER AND LATERALITY OF EPIPTERIC BONES IN THE PTERION IN DRY HUMAN SKULLS OF SOUTH INDIA

Ditty J.Mary and Karthik Ganesh M

Saveetha Dental College and Hospitals, Chennai

ARTICLE INFO

Article History:

Received 3rd January, 2017

Received in revised form 20th February, 2017

Accepted 25th March, 2017

Published online 28th April, 2017

Key words:

Anthropologists, Epipteric bone, pterion, Radiologists, Skulls.

ABSTRACT

Aim: To estimate and analyze the presence, number, incidence and laterality of epipteric bones in the region of pterion in dry human skulls of South India.

Objective: To evaluate the relative frequency of occurrence, number and laterality of epipteric bones of the pterion on examining dry human skulls and to analyze its variability in different populations.

Background: The floor of the temporal fossa is formed by the frontal bone, parietal bone, greater wing of the sphenoid and the squamous part of the temporal bone. All four bones meet on each side at an H-shaped junction of sutures termed the 'pterion'. Epipteric bones are small irregular bones developing at the site of pterion because of additional ossification centers. Its presence is important for anthropologists, radiologists and neurosurgeons.

Reason: The number and incidence of epipteric bone are of much interest to anthropologists. The presence of epipteric bones provides false impression of fractures or fractures may be misinterpreted as epipteric bones on examining cranial radiographs. The knowledge of epipteric bones are important to fix the site in burr hole surgeries for neurosurgeons.

Copyright©2017 Ditty J.Mary and Karthik Ganesh M. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

The temporal fossa is an important area of the skull that is bounded inferiorly by the zygomatic arch, superiorly and posteriorly by the temporal lines and anteriorly by the frontal process of the zygomatic bone. The frontal bone, parietal bone, the greater wing of sphenoid and squamous part of the temporal bone forms the floor of the temporal fossa. All these four bones meet on each side at an H-shaped junction of sutures termed the 'pterion'. Epipteric bones or epipteric ossicles are small irregular bones developing at the site of pterion because of additional ossification centers. According to Bergman *et al.*, (1) nearly 40% of skulls have sutural bones in the vicinity of the lambdoid suture. The next most common is the epipteric bone found near the pterion [1]. There can be another wormian bone called preinterparietal bone or Inca bone found at the lambda. Perusal of relevant literature reveals that major work on pterion is limited to the type of sutural patterns in pteric region in the primates as well as in several races of mankind. Very little literature is available regarding the study of epipteric bones in different populations. The knowledge of the variations of pterion and its clinical anatomy, in Indian population are important for surgeons operating in the field [2].

Epipteric bones can cause weakness of the cranium and can help in extension of the fractures according to their locations. These bones also provide false impression of fractures or the fracture may be interpreted for epipteric bones especially in the region of pterion or asteroid either radiologically or clinically and may produce complications during burr hole surgeries.[3]. The incidence of epipteric bone is of extreme importance in anti-mortem cranial radiograph and forensic medicine as the presence of epipteric bones provides false impressions of fractures or fractures may be interpreted as epipteric bones. Although their occurrence is less frequent, their presence may severe as a moderate marker for the identification of various anomalies and syndromes of the central nervous system and is relevant to anthropologists, neurosurgeons and radiologists to diagnose and manage it accordingly[4][5][6].

MATERIALS AND METHODS

The study was conducted in the Department of Anatomy, Saveetha Dental College, Chennai. A total of 60 dry human skulls of unknown sex and without any gross abnormality were collected and evaluated. All skulls were serially numbered from 1 to 60. The skulls were macroscopically observed with naked eye. In each skull the presence, number, incidence and laterality i.e., present unilaterally or bilaterally and for the side of unilateral presence were observed, noted

*Corresponding author: **Ditty J.Mary**

Saveetha Dental College and Hospitals, Chennai

and photographed. The results obtained were analysed, tabulated and represented in percentages.

RESULT

Epipteric bones were noted in 11 out of 60 skulls. Out of 11 skulls, 10 skulls showed epipteric bone on one side (unilateral) and remaining 1 skull showed epipteric bone on both sides (bilateral). Among the unilateral skulls epipteric bone occurrence was more common on the right side than on the left side. The epipteric bones which are present occurred as 2 fragments in 1 skull and in the rest it was present as 1 fragmented bone. The Incidence, Laterality and Side of unilateral presence are given in Table 1, 2 & 3 and Figure 1 & 2.

Table 1 Incidence of Epipteric bones

Total Skulls Examined	Number of skulls showing Epipteric bones	Percentage (%)
60	11	18.30%

Table 2 Laterality of Epipteric bones

Number of Skulls with Epipteric bones	Laterality	Number	Percentage (%)
11	Unilateral	10	90.90%
	Bilateral	1	9.10%

Table 3 Side of Unilateral presence of Epipteric bones

Total Number of Unilateral Epipteric bones	Side	Number	Percentage (%)
10	Right side	7	70%
	Left side	3	30%

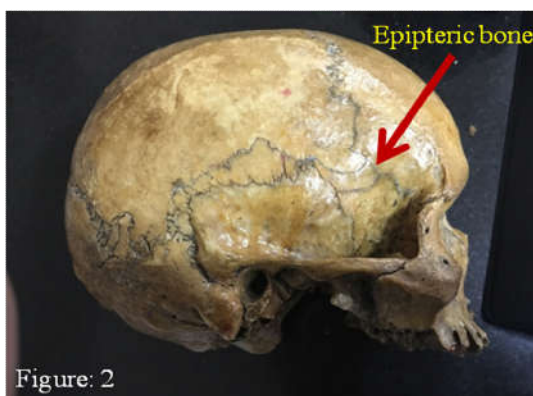
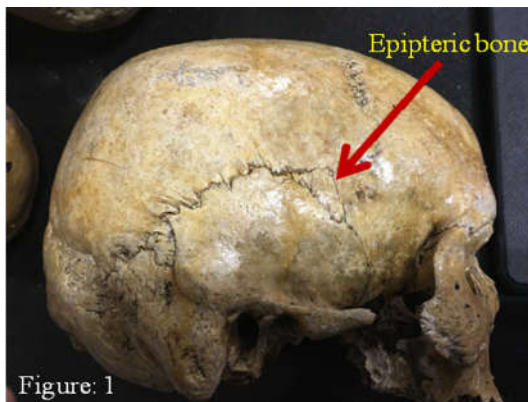


Figure 1 & 2 shows the Epipteric bone at Pterion on Right Side of the Skull

DISCUSSION

Various hypotheses have been put forward to justify the existence of epipteric bones. The most appropriate hypothesis was put forward by Ranke in 1898[7]. He was of the view that the postero-superior border of the greater wing of sphenoid has got a separate centre of ossification. This center fuses with the greater wing of the sphenoid during the 4th month of the intrauterine life. In case, it fails to unite with the greater wing, it results in an epipteric bone. Here the incidence of epipteric bones is 11 out of 60 skulls out of which 10 was unilateral and 1 was bilateral and among the unilateral skulls epipteric bone occurrence was more common on the right than on the left side.

Pterion junction has been used as a common extra-cranial landmark for surgeons in microsurgical and surgical approaches towards important pathologies of this region. Pterion is an important landmark for anterior branch of middle meningeal artery, Broca's motor speech area to the left, insula, the lateral cerebral fissure, for the pathologies of optic nerve, orbit, sphenoidal ridge and for the anterior circulation aneurysm and tumors. Because of its clinical importance the present study was focussed on presence, number and laterality of epipteric bones on pterion. Thus its presence is important for anthropologists, radiologists and neurosurgeons.

CONCLUSION

To conclude, the occurrence and laterality of epipteric bone in human skulls is variable in different populations. Identification of the occurrence of epipteric bones at the site of pterion and its variations are important for neurosurgeons, radiologists and anthropologists. As incidence of epipteric bone is variable, further studies will be required on different populations. The number and incidence of epipteric bones are of much interest to Anthropologists.

The presence of epipteric bone provides false impression of fractures or fractures may be misinterpreted as epipteric bones on examining cranial radiographs for Radiologists. The knowledge of epipteric bones are important to fix the site in burr hole surgeries and other related surgeries in the region of pterion for Neurosurgeons. The occurrence and laterality of epipteric bone in human skulls is variable in different population and the knowledge about their presence, throws light upon the anatomico-clinical significance of sutural/epipteric bones in the cranium.

References

1. Pavan P. Havaldar, Shruthi B.N, Shaik Hussain sheib, Henjarapa K S. Morphological Study on Shapes of Pterion. *International Journal of Anatomy and Research, Int J Anat Res* 2015, Vol 3(4):1555-58. ISSN 2321- 4287 DOI.
2. Bergman RA, Afifi AK, Miyauchi R. Skeletal systems: Cranium. In: *Compendium of human anatomical variations*. Baltimore, Urban and Schwarzenberg 1988; 197-205.
3. Study of Pterion And Incidence Of Epipteric Bones In Dry Human Skulls Of Gujarat Dr. Chirag R. Khatri, Dr. Sumit Gupta, Dr. Jagdish S. Soni

4. Ashley Montagu. The Anthropological significance of the pterion in the primates. *American Journal of Phys Anthropol* 1953; XVIII: 159-336.
5. A prospective anatomic study of epipteric bones in dry human skulls of Karnataka Sucharitha Annam and Roshni Bajpe / *International Journal of Biomedical and Advance Research* 2016; 7(6): 262-264. 262 *International Journal of Biomedical and Advance Research*
6. Brock E. On pteric suture and pteric bones in human skull. *Proc Sect Science* 1914; 2: 634-639.
7. Ranke. J. Der Stirnforsatz der Schlafenschuppe bei den Primaten - Sitz, *Mathem. Phys. Cl. Akad. Wiss. Munchen* 1898; 27: 227 - 270.

How to cite this article:

Ditty J.Mary and Karthik Ganesh M (2017) ' Incidence, Number And Laterality Of Epipteric Bones In The Pterion In Dry Human Skulls Of South India', *International Journal of Current Advanced Research*, 06(04), pp. 3198-3200.
DOI: <http://dx.doi.org/10.24327/ijcar.2017.3200.0223>
