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Original Research Article

INCIDENCE OF EPIPTERIC BONES: AN ANATOMICAL STUDY WITH CLINICAL IMPLICATIONS

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ABSTRACT

Introduction: Epipteric bones are small irregular ossicles that occur near the former antero lateral fontanelle of the cranium having no regular relations to their normal ossific centres.

Materials and Methods: The present study was conducted on 120 dry adult human skulls collected from both the Anatomy and Forensic Department also from the students of Shadan Institute of Medical Sciences, Teaching Hospital and Research Centre. They were examined meticulously for the presence of Epipteric bones and photographs were taken.

Results: In the present study the unilateral occurrence of epipteric bones was seen in 6 (5%) skulls out of 120 skulls. 4 (3.33%) skulls showed in left pterion and 2 (1.67%)skulls showed in right pterion. Only in one case 2 sutural bones were present at the right pterion. Remaining skulls showed single relatively larger epipteric bones.

Conclusion: The anatomical knowledge of the epipteric bones is essential for anthropologists, radiologists reporting skiagrams of skulls in head injuries, neurosurgeons while performing burr holes during excision of intra cranial tumours and neuroanatomists.

KEY WORDS: Pterion, Epipteric bones.

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INTRODUCTION

The sutural bones present near the pterion are termed as epipteric bone or flower's bone or pterion ossicle. Pterion is the region seen in the lateral view of the skull, which is the junction of the parietal, frontal, greater wing of sphenoid and squamous part of the temporal bones. For the determination of age and sex, pterion serves as an important land mark. Broca [1] classified the pterion into three types. They are sphenoparietal, frontotemporal and stellate. Later Murphy [2] revised and expanded the classification into four types. They are sphenoparietal, frontotemporal stellate and epipteric types. The mechanism of the formation of the wormian bones is still not clear. Different authors state different reasons trying to explain the reason of their formation. Hess [3] believes that the wormian bones develop due to external influences and Pal GP[4] believes then to be genetically determined.

MATERIALS AND METHODS

About 40 dry human skulls (unknown sexes)were collected from the department of Anatomy and 9 skulls from Department of Forensic. 71 dry human skulls were collected from the I MBBS Students. Total of 120 dry adult human skulls were examined meticulously for the presence of Epipteric bones and photographs were taken.

RESULTS

In the present study the unilateral occurrence of epipteric bones was seen in 6 (5%) skulls out of 120 skulls. 4 (3.33%)skulls showed in left pterion and 2 (1.67%) skulls showed in right pterion. Only in one case 2 sutural bones were present and rest all showed single relatively larger epipteric bones. In the present study their bilateral incidence was not noticed. 4 skulls showed at their left pterions epipteric bone which were large present at the junction of sphenoid, frontal, parietal and temporal bones. Fig. [1] one skull showed at its right pterion a large epipteric bone with its anterior pointed portion at the meeting of frontal and sphenoid bone. The posterior portion it was at the meeting of parietal and temporal bones. Fig [2] one skull showed a small triangular epipteric bone at its left pterion. The apex of this triangular bones was seen just touching the sutural line sphenoid bone and about 3/4th of the bone was seen extending into the squamous part of the temporal bone. It did not have any extension into the frontal and parietal bones Fig [3]. One skull showed 2 wormian bones separated by a faint sutural line at its right pterion. The smaller posterior bone was at the meeting of parietal and temporal bones while the larger anterior bone was at the meeting of the frontal and sphenoid bone predominantly. Fig [4]

Fig. 1: Single epipteric bone at left pterion. (shown in the cirlcle) Present at the junction of the frontal, parietal, temporal and sphenoid bones.

Fig. 2: Epipteric bone (shown in the circle) in the right pterion. The anterior pointed part is seen between the meeting of frontal and sphenoidal bones. The posterior portion is seen between the meeting of parietal and temporal bones.

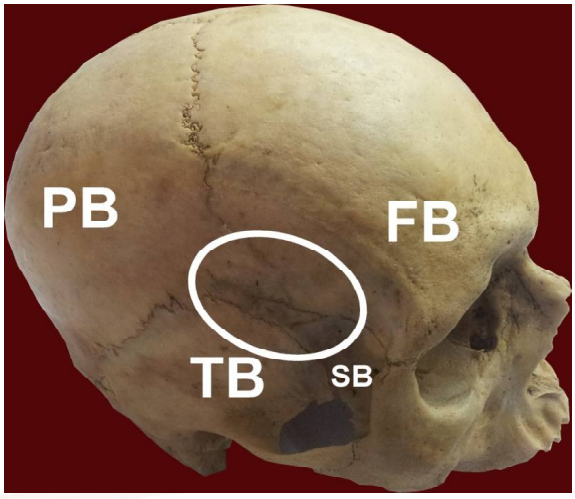

Fig. 3: A triangular epipteric bone (shown in the circle) seen at the left pterion. The pointed apex is seen just touching the sutural line of the sphenoid bone . About ¾ of it is seen extending into squamous part of the temporal bone.

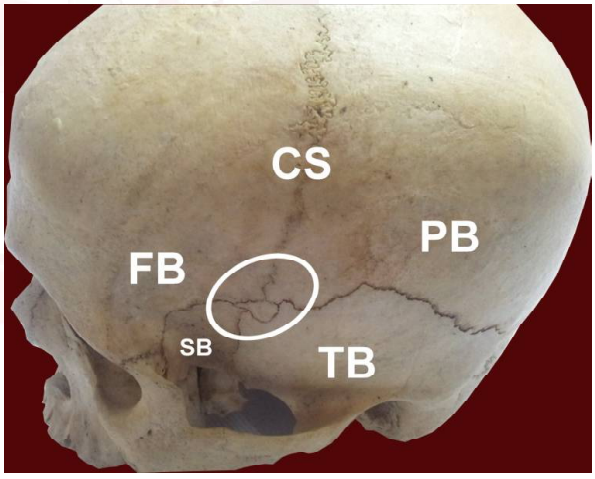

Fig. 4: Two epipteric bones (shown in the circle) seen at the right pterion. The posterior smaller bone is present at the meeting of parietal and temporal bones. The larger anterior bone present at the meeting of the frontal and sphenoid bones.

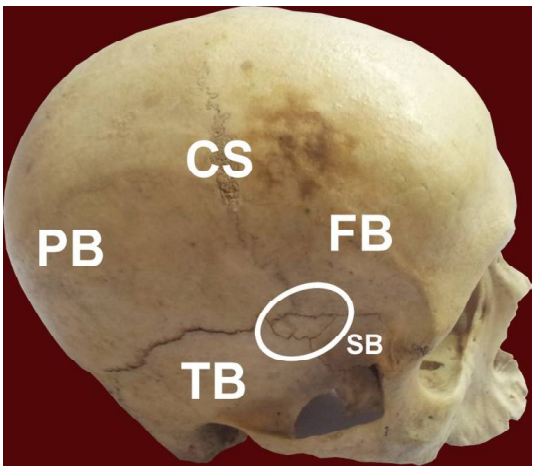

Table 1: Showing the incidence of epipteric bones in the present study conducted on 120 skulls.

Epipteric bones	Number of skulls and Percentage
Present	6 skulls (5%)
Absent	114 skulls (95%)

Table 2: Showing the incidence of epipteric bones reported by different authors.

Name of the author (Year)	% of Incidence of epipteric bones
Saxena (1988) [6]	11.79%
Mwachaka PM (2009) [8]	6.70%
Manjula patil (2012) [7]	12.22%
Uday Kumar(2016) [9]	5.30%
Rajasekhar (2016) [10]	4%
Present study (2016)	5%

DISCUSSION

The present study was to know the incidence of epipteric bones occuring in the adult skulls of Telangana region. 6 (5%) skulls showed the incidence of epipteric bones 4 (3.33%)skulls on left side and 2 (1.67%) on right side.

Bergman et.al.,[5] stated the incidence of epipteric bones to be the second most common type of sutural bone after the sutural bones occuring in the lambdoid suture (being the first). Saxena et.al., [6], Manujla Patil et.al., [7] reported the incidence to be 11.79% and 12.22% respectively. The results of the present study are much lesser when compared to their results. Mwachaka PM et.al.,[8] and Uday Kumar et.al., [9] reported their incidence to be 6.7%. and 5.30% respectively. The present study reports their incidence to be 5% which is close to the findings of Uday Kumar when compared. Rajasekhar et.al., [7] reported their incidence to be 4% 2 cases at the left pterion and 1 at the right pterion. All of them were unilateral in occurrence. In the present study the epipteric bones were all unilateral in occurrence, 4 cases on the left pterion and 2 cases on the right pterion. In both the studies no bilateral occurrence was noticed and the reported incidence of 5% in the present study is much closer to his results 4%. In the both the studies the occurrence of the epipteric bones was more on the left side than on right side of the skulls.

Hussain et.al., [11] reported 2 skulls with epipteric bones at right pterion and 1 at left pterion. A skull with 2 wormian bones at right pterion. The smaller bone was at the meeting point of frontal bone and sphenoid bones, larger was between parietal, sphenoid and frontal bones. But in the present study which differs from his observation, 4 skulls showed wormian bones at left pterion and 2 at right pterion. 1 skull showed 2 wormian bones were at right pterion. The smaller bone was at the meeting point of parietal and temporal bones at the larger was at meeting of frontal sphenoid and temporal bones.

Raju sugavasi et.al.,[12] reported a unilateral single epipteric bone on the left pterion. In the present study the incidence of all the epipteric bones was unilateral and higher at left pterion.

Satheesha NB [14] reported a case of unusual sutural bones at pterion. 3 bones, the smallest was at the meeting point of frontal, sphenoid and parietal bones, the medium sized bones was between parietal, sphenoid, and temporal bones. The largest was between the temporal and parietal bones. In the present study only 2 wormian bones were seen at pterion. Pryles CV [13] reported the presence of the sutural bones is usually associated with cranial and nervous system anomalies. In the present study the skulls did not show any such abnormalities. Ersoy M [15] opined that the presence of epipteric bones can lead to complications while making burrholes by the neurosurgeons. The pterion is relatively softer when compared to the other regions of the skull.

CONCLUSION

Incidence of the epipteric bones in the present study was 5% in total, 3.33% at left pterion and 1.67% at right pterion and unilateral in occurrence. The knowledge of incidence of epipteric bones is very essential for the radiologists while interpreting skull radiographs in cases of head injuries. The fractures of the temporoparietal bones is frequent in cases of epidural haematoma. In such cases if epipteric bones are present then may lead to confusion while reporting the bone windows in C. T. scans. Neurosurgeons must be aware of these variations while performing burrholes using a perforator at pterion while performing craniotomy during excision of intracranial tumors.

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Conflicts of Interests: None

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