

Study on Asterion and Presence of Sutural Bones in South Indian Dry Skull

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Abstract:

Aim: To study morphological features of asterion and presence of sutural bones in posterior side of the 25 human skull.

Objective: To know the detailed anatomical knowledge of sutural morphology of asterion and formation of sutural bone.

Background: Asterion is the point on Norma lateralis where parietal, temporal and occipital bones meet. It has many neurosurgical importance so any variation during surgery cause damage to dural venous sinuses. Presence of sutural bones will complicate surgical orientation, so it is important to study about the formation of sutural bones and its pattern.

Materials and methods: The study will be performed on 25 south Indian dry skull of unknown age and sex taken from the department of anatomy at Saveetha dental college and hospital, Chennai.

Reason: A Research on this topic will lead to the outcome of asterion position from various anatomical landmarks and incidence of sutural bone at posterior side of the skull.

Keywords: asterion, sutural bones, surgical importance.

INTRODUCTION:

The asterion is the junction of the parietal, temporal and occipital bone. It is the surgical landmark to the transverse sinus location, which is of great importance in the surgical approaches to the posterior cranial fossa[1]. The sutural morphology was classified into two types: Type 1 where a sutural bone was present and Type 2 where sutural bone was absent. occur within a suture in the cranium. These are irregular isolated bones that appear in addition to the usual centres of ossification of the cranium and are seen rare. It is important to know about these bones because they can mislead in the diagnosis of fracture of skull bones in medico legal cases. Hence the study of sutural morphology seen in the posterior of the skull is essential as it may complicate the surgical orientation if present in the asterion[2,3].

MATERIALS AND METHODS:

The present study was carried out in 25 adult dry South Indian skulls in the Department of Anatomy, Saveetha dental college and hospitals. The distance from the asterion towards: a) root of the zygomatic arch, b) apex of the mastoid process and c) external occipital protuberance were recorded. Asterion present on the both sides of the skull were measured from these locations. A digital vernier calliper with a precision of 0.01 mm data was used for each of the then classified into two types where in type-1 sutural bone was seen and in type 2 sutural bone where absent. Presence of sutural bones in the posterior surface of the skull was also noted.

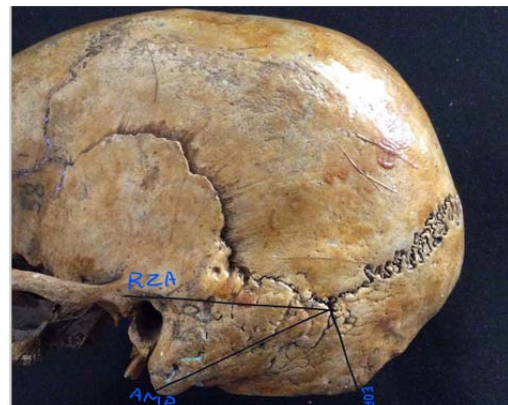


Image :1 Distance of various anatomical landmark from asterions
RZA-Root of zygomatic arch
AMP- Apex of mastoid process
EOP-External occipital protuberance

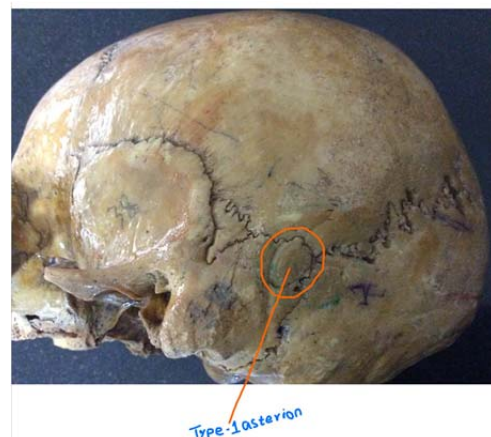


Image 2



Image 3

RESULTS:

Out of the total 25 skulls, Type-1 asterion were found in 32% cases and in 68% incidences, Type-2 were observed. The average distance of the various morphometric parameters are shown in (table-1). 20% of the Type-1 asterion was seen on the left side of the skull, whereas only 12% were seen on the right side. Type-2 asterion were seen in 80% on the left sides and 88% on the right side of the skull (table -2).

Table: 1

From	Towards	Mean (mm)
Asterion	Root of Zygomatic Arch	53.89
Asterion	Apex of the Mastoid Process	50.84
Asterion	External Occipital Protuberance	61.41

Table: 2

Asterion	Left side	Right side	Total
Type-1 Asterion	20%	12%	32%
Type-2 Asterion	80%	88%	68%

DISCUSSION:

The findings of the present study are almost similar with those of previous studies (Table 3). The MSX2 gene, which encodes a home domain transcription factor, Plays a crucial role in craniofacial morphogenesis by effecting fusion of sutures[4]. In this study the anatomical landmark of asterion from various position will help Neurosurgeons use this point to orient themselves, in order to plan safe entry into the skull for some operations.

Table: 3

Authors	Asterion-Root of Zygomatic Arch	Asterion-Apex of Mastoid process	Asterion-External occipital protuberance
Martinez et al.(2000) ⁶	55.42	49.70	64.40
Galindo-de Leon et al (2012) ⁷	54.74	51.33	61.51
Mohammed Ahad (this study) (2015)	53.83	50.84	61.41

Table: 4

Population	Number	Type-1 Asterion	Type-2 Asterion
North america ⁸	50	12%	88%
Turks ⁹	302	9.92%	90.08%
Kenyas ¹⁰	79	20%	80%
Australian aborigines ¹¹	-	19.8%	80.2%
South Indian (present study)	25	32%	68%

In the present study type-1 asterion occurred in 32% of cases. This frequency is very much higher than other studies(table:4).In north America the type-1 asterion was seen around 12% of skull. While the Turks study shows around 9.92% type-1 asterion only. According to this study, the type -1 asterion are seen most on the left side (20%) than the right side (12%).Graphically shown(fig:1).

The sutural bones were present in almost 48% of the posterior side of the skull.Graphically analyzed (FIG:2). The mechanism of formation of sutural bones is not fully understood. Some authors suggest that these bones develop from pathological influence such as hydrocephalus [5], while others believe that sutural bones develop from normal process and are generally determined.

Fig: 1

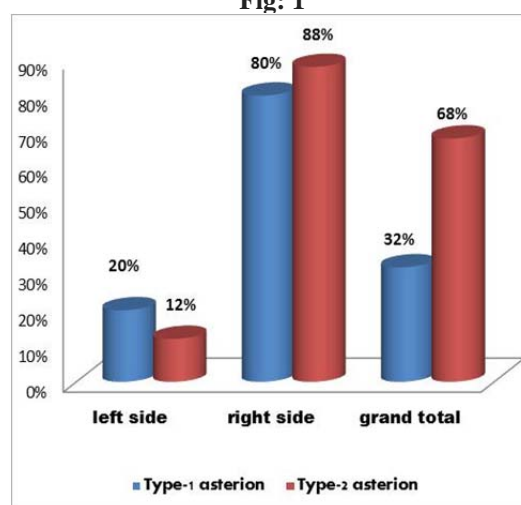
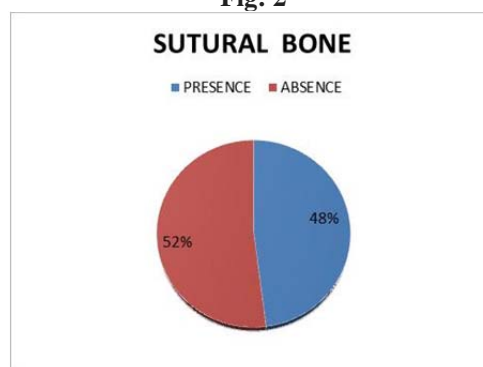


Fig: 2



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