

To Study the Morphology of Pterion in Dry Human Skull in Vidarbha Region

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Abstract: Eighty five (85) dry skulls were studied to find out the variations of Pterion. Sphenoparietal variety of Pterion was seen predominantly along with frontotemporal and stellate varieties. The importance of the pterion is its relation to the middle meningeal artery, Broca's motor speech area on the left side, and surgical interventions relating to pathologies of the sphenoid ridge and optic canal. The present study was done on 85 dry human skulls available in anatomy department and bone sets available with students. The sutural pattern of pterion on right and left side of each skull bone was noted based on description by Murphy (sphenoparietal, frontotemporal, stellate and epipteric types).

Keywords: Pterion, Sphenoparietal, frontotemporal, stellate

1. Introduction

The pterion is the weakest part of the skull and the most interesting bone meeting points in craniofacial osteology. It is an H-shaped sutural convergence formed by frontal, parietal, temporal and sphenoid bones of the skull^(2,3,4,5). It is a common site for the formation of accessory or epipteric bones which may be pitfall when misinterpreted as fractures in radiological study. This pterion junction has been used as a common extra cranial landmark for surgeons in microsurgical and surgical approaches towards important pathologies of this region^(2,6,7,8,9). This point is an important landmark for anterior branch of middle meningeal artery, Broca's area 44-45, insula stem of lateral sulcus^(2,4,8,10). It is also commonly used as an important guide for age by cranial suture closure methodology.

2. Material and Methods

The present study was done on 85 dry human skulls, available in anatomy department and bone sets available with students without considering the sex. The sutural pattern of pterion on right and left side of each skull bone was noted based on description by Murphy¹ (sphenoparietal, frontotemporal, stellate and epipteric types). 1) *The sphenoparietal type (1A)* is defined as a sutural pattern in which the sphenoid and parietal bones are indirect contact, preventing the frontal and temporal bones making contact with one another. 2) *The frontotemporal type (1B)* is a sutural pattern in which the frontal and temporal bones are in direct contact, preventing the sphenoid and parietal bones making contact with one another. 3) *The epipteric type (1C)* is defined by presence of a small sutural bone between the four bones articulating at pterion. 4) *The stellate type (1D)* is characterized by articulation of four bones (frontal, parietal, temporal and sphenoid) at a point.

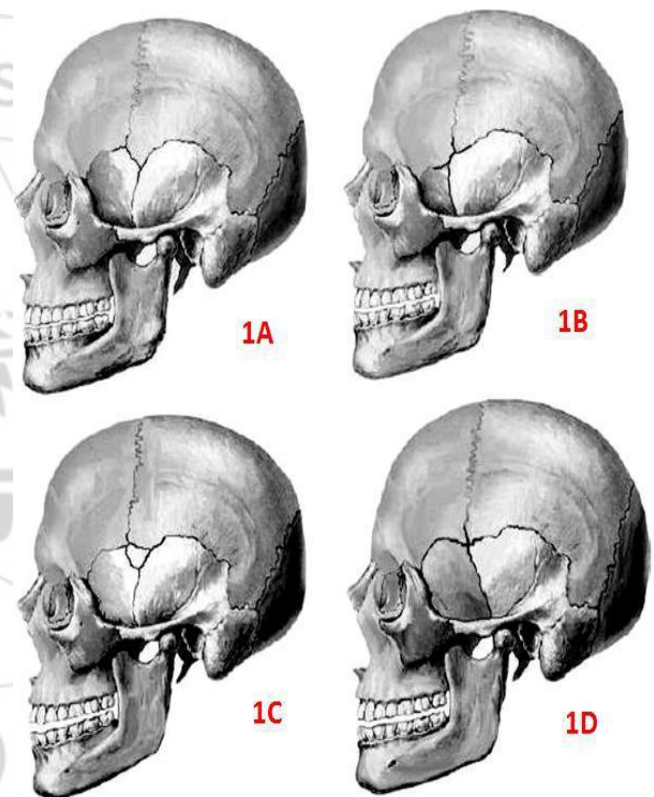


Figure 1:

3. Observation and Result

All types of pterion were found in dry human skull of vidarbha region. The sphenoparietal type was found to be most prevalent in right and left side. Frontotemporal was of less type on both sides. Atypical pterion was observed in 2.35% skulls on right side and 1.17% skull on left side



Figure 2: Epipteric type



Figure 3: (Atypical Type)

Table 1: Type of pterion pattern in vidarbha region

Pterion type	Right side (n=85)		Left side (n=85)		Both side (n=170)	
	number	Percentage (%)	number	Percentage (%)	number	Percentage (%)
sphenoparietal	70	82.35	71	83.52	141	82.94
Frontotemporal	02	2.35	03	3.52	05	2.94
Stellate	04	4.70	05	5.88	09	5.29
Epipteric	07	8.23	05	5.88	12	7.04
Atypical	02	2.35	01	1.17	03	1.76

4. Discussion

Knowledge and understanding of the type and location of pterion and its relation to surrounding bony landmark is important especially in neurosurgery. In present study sphenoparietal, frontotemporal, stellate, epipteric and atypical types of pterion were observed. Sphenoparietal type

of pterion is most common seen in Northern Indians (87.72%)³, South Indians (80%)¹⁴, Nigerians (87.79%) and Turks (87.35%)¹ same as in this study (82.94%); while it was significantly lower in Korean (76.5%)¹⁶ and Kenyan (66%)¹⁷ populations as compared to this study. (Table no.2)

Table 2: Comparison of pterion pattern in different regional and international populations

Population group	Authors	No.of bones	Type of pterion (%)				
			Sphenoparietal	Frontotemporal	Stellate	Epipteric	Atypical
Australian	Murphy ¹ (1956)	388	73	7.5	18.5	01	--
Nigerian	Saxena ¹¹ (1988)	40	87.79	10.1	5.06	3.71	--
Indian	Saxena ¹¹ (1988)	72	95.30	3.46	1.38	11.79	-
Japnese	Matsunura ¹² (1991)	614	79.1	2.6	17.7	0.6	---
South indian	Manjunath ¹³ (1993)	172	93.55	3.52	2.93	17.3	---
Korean	Lee ¹⁴ (2001)	149	76.5	00	00	40.3	----
Turks	Ersoy ⁸ (2003)	300	87.35	3.47	8.98	0.2	---
Turks	Oguz ⁸ (2004)	26	88	10	02	00	--
Kenyans	Mwachaka ¹⁵ (2009)	79	66	15	12	07	---
Indian Gujrat region	Ankur Zalawadia ¹⁶ (2010)	42	91.7	2.4	1.2	4.8	---
South Indian	R Sudha ¹⁷ et al (2013)	150	80	03	5.3	11.3	---
	Present study	85	82.94	2.94	5.29	7.05	1.76

5. Conclusion

Knowledge of the location and relations of pterion is important in relation to surgical intervention, particularly with respect to course of branches of middle meningeal artery and broca's motor speech area on the left side. Sphenoparietal type of pterion was found to be predominant type regionally and internationally. Vidarbha region population recorded 82.94% sphenoparietal type, frontotemporal 2.94%, stellate 5.29%, epipteric or accessory sutural bone 7% was observed. Atypical pterion was observed in 1.76% of skulls. Accessory sutural bone incidence should alert radiologist and neurosurgeons when

interpreting x-rays or surgically correcting a fracture. This study will definitely be helpful to the Anatomist.

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