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Research Article

A STUDY ON METOPIC SUTURES IN UNKNOWN HUMAN SKULLS

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Keywords: Complete Metopic suture-incomplete Metopic Suture-Bregma-Nasion-Metopism.

ABSTRACT

Aim: Objective of present study is to know the percentages of incidences of complete and incomplete metopic sutures.

Place of the Study: The present study done was on Metopic sutures that came across in dry unknown human skulls in the Department of Anatomy in at Narayan Medical College, Nellore, AP.

Period of Study: This study was carried out during the year 2008-2009.

Materials & Methods: Sixty Two Unknown dry human skulls from the Department of Anatomy in Narayan Medical College, Nellore, Andhra Pradesh constituted the material for the present study. Each skull was examined for the i] presence or Absence of metopic sutures, & their number, ii] type [complete or incomplete] iii] their pattern y-shaped, Vshaped, iv] Extent, v] Their location. Any associated bony abnormalities are also examined.

Results: This study showed more percentages of incomplete Metopic sutures-Metopism [25.80%] & less percentages of complete Metopic sutures in [4.838%]%. Complete Metopic sutures extended from Nasion to Bregma in the mid line over the frontal bone, while Incomplete metopic were found at the root of nose.

Conclusion: This difference in percentages of incidences was due to either population or racial or numerical differences.

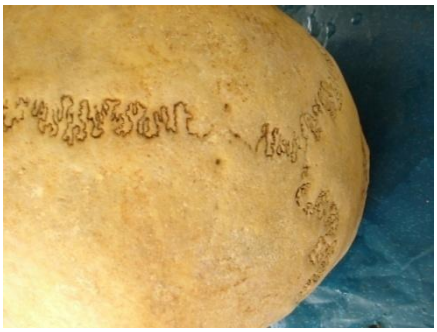
INTRODUCTION

At birth two halves of the Frontal bones are present. Later they fuse to form single frontal bone by 7th or 8th year Occasionally there is absence of fusion frontal bone giving rise to Metopic Suture. Sometimes there may be wormian bones present [1]. Metopism is complete Metopic suture extending from Nasion to Bregma commonly seen in higher races & in Brachiocehalics[2] Metopic suture present in the midline extends from bregma to Nasion. These sutures may be complete or incomplete. When they are extending from Nasion to Bregma, it is known as Metopism or Complete Metopic suture. There are various types of metopic sutures. They are linear type or V-Shaped type[3]. A small ossification center appears in the 9th week of intrauterine life in the center of each supraorbital part of frontal bone. There will be eyebrow like thickening in the frontal bone by 11 weeks. In the second trimester, there is progressive radial bone expansion and metopic suture delineation occurs. There is closure of metopic sutures in the third trimester commencing from glabella and going upwards towards the anterior frontanelle.[4] Inderjit and Shah has shown the presence of double Metopic sutures[5].

MATERIALS & METHODS

All the skulls were studied for the presence of Metopic sutures. Sixty two skulls [30.645%] were studied from the Department of Anatomy, Narayan Medical College, Nellore, AP constituted the materials for the present study. The length, breadth & type of serrations were noted with the thread or scale. Both complete or incomplete metopic suture were observed. Dimension of skull were measured to determine whether they belonging to brachycephalic, dolichocephalic or mesencephalic. Broken skulls with metopic sutures were discarded, only good intact were chosen for the study.

Photograph Showing Unusual Length [Very Long] of Styloid Process



Showing both Sagittal and Coronal Sutures Severe Serrations

Less serrations in the coronal suture & severe serrations in the sagittal sutures with very small epipteric bones.

OBSERVATIONS & RESULTS

Table-1: Showing various types of Metopic Sutures

S.No	Type of metopic sutures	positions	Outer aspect of skull	Cranial surface of skulls	Wormian bones
1	Incomplete	At the root of the nose—Highly serrated near nasion.	Present	-----	Absent
2	Incomplete	At the root of the nose-Highly Serrated near nasion.	Present	------	Absent
3	Incomplete	Highly serrated near nasion	Present	-----	Absent
4	Complete	Extending from the nasion to Bregma	Present	Cut skull—serration visible	Larged size wormian bones visible
5	Complete	Extending from nasion to Bregma	Present	------	Small sized wormian bones seen

Only, 16 skulls were showing incomplete metopic sutures 3 skulls were with complete metopic sutures [But not shown in table]. Totally Nineteen skulls [30.645%] were showing metopic sutures where 16 were incomplete [25.80%] and three were complete[4.838%].

Table-2: Showingthe incidences of Metopic suturesas reported by various authors

Serial number	Author	Year	Subjects	Incidence of Metopic sutures	Remarks
1	Cunningham	1964	European	8%	---
2	Frazer	1960	European----- African---- Mongolian----	7-10% 1.0% 4-5%	----
3	Linc & Fleischman	1969	Czech skulls--	11%	---
4	Davies	1969	Not specified--	9%	---
5	Rau	1934	Dravidian--	4%	---
6	Inderjit and Shah	1948	Punjabis--	32.5%	---
7	Dixit and Shukla	1967	UP subjects	2.53%	---
8	Anjamani et al	1989	Nigerian	3.4%	---
9	Woo	1949	Mongoloids	10%	---
10	Das, Saxena & Baig	1973	U P Subjects	24.65%	---
11	Present study	2007	Indian Subjects	30.645%	--

DISCUSSION

Present study has shown 19 skulls with metopic sutures [30.64%]. Out of them, three were complete metopic sutures extending from Nasion to Bregma [4.838%] & rest which are present at root of the nose [sixteen] were incomplete sutures [25.80%]. No skull has shown traces of metopic sutures in the upper part of frontal bone nor in the middle of the bones, and no skull showed double metopic suture unlike in other studies. Incidences of metopism [complete metopic suture] was higher than Rau et al studies [4.0%], but lower than Linc & Fleischman [1969] in Czech skulls [11%], and Inderjit & Shah in Punjabi Adult skulls [5%]. Inderjit and Shah M has shown presence of double Metopic sutures[5]. The present study has confirmed the view of Cunningham who stated that ''Obliteration of Metopic sutures begins at the level of Frontal Eminence and extends both upwards and downwards. Traces may be left either at Bregma or Nasionif fusion is not complete''[6] The length of Metopic suture were 11cm, 11.2cm and 10.8cm respectively. They were almost straight with less serrations. 11 skulls showed serration at the root of nose-NASION. Complete Metopic sutures. in our study was higher than Dixit & Shukla studies in UP subjects [2.53%]. [7]

My previous study [2014] on metopic sutures was done in the Department of Anatomy at Velammal Medical College, Madurai, has revealed complete metopic sutures observed in three out of 32 unknown dry human skulls and incomplete metopic sutures at nasion in 9 out of 32 skulls. Serrations were more on posterior half of the skulls near bregma[8]. In 10% of subjects with craniosyntosis, there will be premature closure of metopic sutures [9]. Sometimes metopic sutures are mistaken for fractures of bones of skull [frontal bones] and they do not have any clinical significance[10]. As per Baaten et al studies in Lebanese population, incidences of both complete and incomplete metopic sutures were more in Rural population than in Urban population[11]. Rau conducted a study on metopic sutures on skulls of Dravidian origin in Madras population in 1934 with a incidence of 4%.[12] Ajamani et al conducted a study on metopic sutures in 206 Nigerian skulls. The study showed metopic sutures in 34.97% of skulls and Metopism in 3.4% of the skulls [13]. As per Jit and Banga, shape of the cranium is not affected by persistent metopic sutures.[14]

Present Study: In our present study, there were more number of incomplete metopic sutures [25.80%] and only three complete sutures [4.838%] higher than Rau [1934] studies. There were no incidence of double metopic sutures, split metopic sutures nor V-type and Y- type of sutures. There were two skulls showing unusual long styloid process, other skulls showed prominent bony prominences like mastoid process. Three skulls showed numerous wormian bones Four skulls showed frontal bone prominences and prominent external occipital protuberances [inion]. Regarding serrations, most of skulls showed less serrations except two skulls showed more serrations through their length. This study has been well correlated with earlier workers that has given knowledge in different population The higher incidence of Incomplete Metopic population may be due to either population difference, numerical difference or Racial difference.

CONCLUSION

This study showed high percentages of incomplete metopic sutures [25.80%] & less percentages of complete metopic sutures [4.838%] [Metopism]. This may be due to either numerical difference of intact good skulls or due to differences in race or population. Presence of Metopic sutures has no clinical significance.

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