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Persistent Metopic Suture in Adult Skulls of Andhra Pradesh

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Abstract: *Majority of Skull bones are held together by fibrous joints termed as sutures. At birth the two halves of frontal bone remain separate as the metopic suture which is replaced by bone at about 2 years. The persistence of this suture beyond 8 years of age is termed as metopism. The study was conducted on 90 adult human dry skulls. Among them 55 were obtained from department of anatomy RIMS Ongole, A.P. and 35 from department of Forensic Medicine, RIMS Ongole. the sutures were classified as complete and incomplete. Out of 90 skulls complete metopic suture is seen in 2skullsand incomplete metopic suture is seen in 4 skulls which is of linear type .The incidence of metopic suture in our present study is 6.66% and the incidence of complete metopic suture is 2.22% & the incidence of incomplete metopic suture is 4.44%. The knowledge of anatomy of metopic suture is important for radiologists, neurosurgeons, for treatment and autopsy surgeons for medico-legal cases. There is difference in the incidence of metopic suture in different races and different geographical regions.*

Keywords: *Bregma , frontalbone, metopic suture, metopism, nasion.*

I. Introduction

Majority of Skull bones are held together by fibrous joints termed as sutures . Frontal bone is a unpaired bone of the skull forming the forehead which is a common area for scalp & face. Each half of frontal bone is ossified in membrane from one primary centre which appears near the frontal tuber in 8th week of intra – uterine life. The fusion starts at anterior fontanellae and terminates at nasion. At birth the two halves of frontal bone remain separate as the metopic suture which is replaced by bone at about 2 years .The persistence of this suture beyond 8 years of age is termed as metopism. The term Metopic is from Greek meaning in the middle of face by Guerram [1].The metopic or interfrontal suture extends from the nasion to bregma & is seen between tubers of the frontal bone. When the metopic suture extends from nasion to bregma, it is complete metopic suture and if the extension is seen in some part of area between nasion and bregma it is incomplete metopic suture .The factors that are responsible for the persistence of metopic suture are genetic causes, hydrocephalus, abnormal growth of skull bones. Remnants of metopic suture may persist in some skulls at the glabella according to A.K.Dutta[2].

According to Gray [3] the incidence of the metopic suture is 9% in adult human skulls. G.J Romanes [4] says the metopic suture closes by 5 – 6 years. Metopic suture closes in 5% of all craniosynostosis patients according to Merritt's Neurology [5] .Breathnach [6] concluded that metopic sutures varied in different races to be present in 7 – 10 % of European, 4 – 5 % in yellow races and in 1% of African population. In Indian skulls metopic suture is found in 5% by Jit & Shah [7], 3.31% by Das and Saxena [8], and 2.66% by Agarwal, Malhotra,Tiwari [9]. Many studies have shown lot of age variations ranging from 1 -7 years. Metopic suture is important because it is mistaken for frontal bone fracture in radiography which is an useful information for the radiologists in day to day practice. It is also useful in medico- legal cases in the department of Forensic Medicine and in the surgical departments like Neurosurgery for the treatment purposes .In the presence of a persistent metopic suture the frontal sinuses develop separately on either side of the suture, which can be helpful in excluding frontal fractures according to Grays.

The present study highlights the anatomical variations of frontal bone and determines the incidence and persistence of metopic suture.

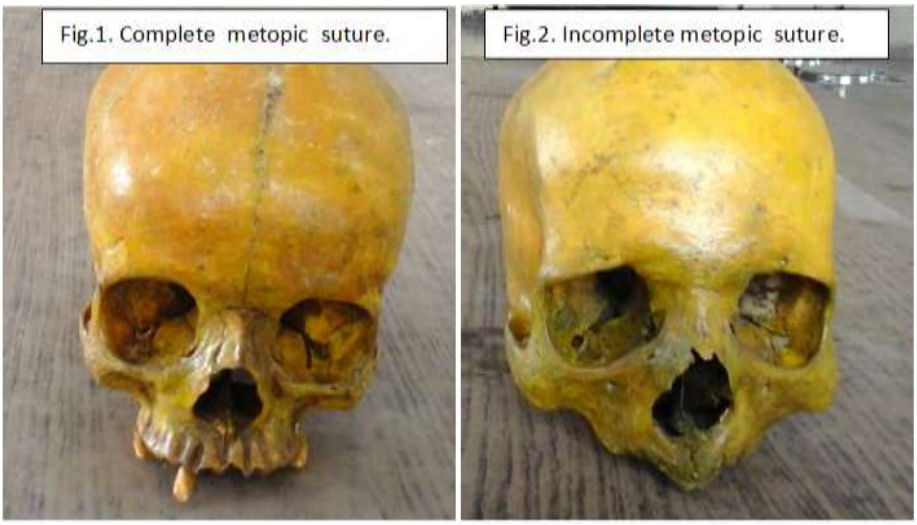
II. Materials & Methods

The study was conducted on 90 adult human dry skulls. Among them 55 were obtained from department of anatomy RIMS Ongole, A.P. and 35 from department of Forensic Medicine, RIMS Ongole. The skulls were examined for the presence of metopic suture. and malformed or fractured skulls were discarded and each skull were thoroughly checked for any defects. The method of classification of the metopic sutures is done basing on the earlier studies on metopic suture [9,10,11].The sutures extending from bregma to nasion is

complete and extending to a smaller distance either from nasion it is incomplete. The incomplete metopic suture may be linear or ' V' shaped and 'U' shaped. The specimens were photographed and the findings were appropriately documented.

III. Observation and results

A total of 90 human adult dry skulls were taken from the departments of Anatomy and Forensic Medicine and studied for the presence of persistent metopic suture. Complete metopic suture is found in 2 skulls extending from Bregma to Nasion. Incomplete metopic suture is found in 4 skulls It is seen in the glabella which is of linear type.



IV. Discussion

In our study we found metopic sutures in 6 skulls out of 90. The incidence of metopic suture is 6.66% in our study. The incidence of metopic sutures varies from 1 – 10 % in different races according to study of other workers. It was 1.2 % in Negroes,8.7% in Europeans and 5.1% in Mangolians by Bryce [10], 3.4 % in Nigerians skulls by Ajmani [11], 3.31 % in Indians by Das Etal [8], 5% by Jit & Shah in Indians ,5% by Gupta Rakesh Etal [12] in Uttar Pradesh , India.3.5% by Anjoo Yadav Etal [13] in North Indian skulls 5.4% in Karnataka region by V.Ravi Kumar etal [14], 7.14% in Central India by Sameer Sathe etal [15]. Metopic suture have been studied by various authors where the incidence of metopic suture is differing from race to race. This is an useful information for the anthropological studies. Few Authors say that the persistent metopic suture is an adaptation for giving birth to babies with larger brains. They also stated that metopism may be an alteration for rapidly growing brain after birth and also to the expansion of frontal lobes. Genetic etiology is also seen in cases of metopism by Castilho[16]. Metopism can be related to abnormal growth of cranial bones , hydrocephalus ,heredity & atavism [17].Metopic suture is seen in Baller-Gerold and chromosome 9p monosomy according to Merritt's neurology. Impaired closure of metopic suture is common in apert's syndrome[18]. Other causes of metopism include active expression of cytokines during cranial fusion and even resorption of the chondrial tissue[19].

The knowledge of anatomy of metopic suture is important for doctors .metopic suture may be mistaken for frontal bone fractures in radiographs which is an useful information for the radiologists in day to day prac tice. It is also useful in medico-legal cases in the department of forensic medicine and in the departments like neurosurgery for the treatment purposes. In the presence of persistent metopic suture, the frontal sinuses develop separately on either side of the suture, which can be helpful in excluding frontal fractures according to Gray'sAnatomy. While reading the xray/CT &MRI films the possibility of metopic suture should always be evaluated in the list of differential diagnosis [20].

V. Conclusion

The study was carried out on 90 adult human skulls of Andhrapradesh and the incidence of metopic suture found in our present study is 6.66%. Complete metopic suture is found in 2 skulls and the incidence of complete metopic suture is 2.22%. Incomplete metopic suture is found in 4 skulls and the incidence of incomplete metopic suture is 4.44%.

The knowledge of presence of metopic suture is important in diagnosing the frontal bone fractures and in medico legal cases. The study shows that there is difference in the incidence of metopic suture in different races and different geographical regions.

References

[1]. Guerram A, Le Minor JM, Renger S, Bierry G. Brief communication: The size of the human frontal sinuses in adults presenting complete persistence of the metopic suture. American Journal of Physical Anthropology. 2014;154:621-627.
[2]. A.K.Dutta, Essentials of Human anatomy, Head & Neck, 5th edn Current books International pp 14
[3]. Gray's Anatomy 40th Edn – The Anatomical basis of Clinical Practice, Churchill Livingstone, elsevier PP 409,472.
[4]. Romanes G.J.Cunninghams Textbook of Anatomy 11th edn London, Oxford University Press, pp 133
[5]. Merrits neurology,11th edition, Lippincott williams & wilkins.
[6]. Breathnach A.S. Frazer's Anatomy of Human Skeleton, 5TH edn, London, Churchill Livingstone.
[7]. Jit .I.& Shah .M.A. Incidence of frontal or metopic suture amongst Punjabi adults, Indian Medical Gazette 1948;83;507 .
[8]. Das.A.C, Saxena.R.C, Beg M.A.Q. Incidence of metopic suture in U.P.subjects,Journal Of Anatomical Society of India 1973;22:140.
[9]. Agarwal SK, Malhotra VK, Tewari SP. Incidence of the metopic suture in adult Indian crania. Acta Anat (Basel) 1979;105:469-474.
[10]. Bryce T.H. Osteology & Arthrology.In Quain's Elements of Anatomy,11th ednVol 4, London Longmann Green pp 177.
[11]. Ajmani.M.L., Mittal.R.K., Jain.S.P. Incidence of metopic suture in adult nigerian skulls,Journal of Anatomy 1983;137(1):177-183.
[12]. Gupta Rakesh,Usman Neema, Zaidi.S.H.H. A Study of Metopic suture in Adult North Indian Skulls, NJIRM 2012;3:82-83.
[13]. Anjoo Yadav, Vinod Kumar, R.K.Srivastava,Study of metopic suture in Adult Human Skulls of North India, J. Anat. Soc. India. 2010;59(2):232-236
[14]. V.Ravikumar,Siri,study of metopic sutures in adult skulls in Karnataka region ,international journal of anatomy& research. 2016;4(3):2674-76.
[15]. Sameer sathe,Rashmi sathe,A study of persistent metopic suture in dry skulls in central India, international journal of anatomy &research,2016;24:61-66
[16]. Castilho SMA, Oda YJ, Santana GDM. Metopism in adult skulls from Southern Brazil. Int J Morphol 2006;24:61-66.
[17]. Falk D, Zollikoferc CPE, Morimotoc N, de Leónc MSP. Metopic suture of Taung (Australopithecus africanus) and its implications for hominin brain evolution. Proceedings of the National Academy of Sciences. 2012;109:8467-8470.
[18]. Faro C, Chaoui R, Wegrzyn P, Levaillant JM, Benoit B, Nicolaides KH. Metopic suture in fetuses with Apert ' s syndrome at 22–27 weeks of gestation. Ultrasound Obstet Gynecol. 2006;27:28-33.
[19]. Vikram S, Padubidri JR, Dutt AR. A rare case of persistent metopic suture in an elderly individual: Incidental autopsy finding with clinical implications. Archives of Medicine and Health Sciences.2016;2:61
[20]. Bademci G, Kendi T, Agalar F. Persistent metopic suture can mimic the skull fractures in the emergency setting? Neurocirugia 2007;18:238-240.