A Study of Metopic Suture in Adult North Indian Skulls

Gupta Rakesh*, Usman Nema, Zaidi S.H.H*****

*Associate professor, Department of Anatomy,R.M.C.H.Bareilly. **Asstt. professor,Department of Anatomy, J.L.N.M.C. Aligarh, ***Professor Department of Anatomy R.M.C.H. Bareilly

Abstracts: Background:- Studies of non metric cranial variants have been a field of considerable interest to research workers especially because of their racial and regional importance. Material and Methods:- Total of 40 north Indian skulls of U.P. were studied for the incidence of metopism, a cranial variant in the present study. Results:- Metopism was found in 2(5%) of total of human skulls. Conclusion:-The presence of Metopic suture found to be of considerable regional and racial significance and it simulates fracture of frontal bone, therefore its presence should be properly ruled out in X-rays. [Gupta R et al NJIRM 2012; 3(1) : 82-74]

Key Words: Metopism ,metopic suture, cranial Variant

Author for correspondence: Dr. Rakesh Gupta, Department of Anatomy, Rohilkhand Medical College ,Pilibhit Bypass Road, Bareilly(U.P)- 243006.e-mail: rakeshgupta1979@gmail.com

Introduction: The suture between the two halves of the developing frontal bone usually disappears during infancy or in early childhood. In some cases it may persist as a complete suture extending from the Nasion to the Bregma(Fig No.1,2). This condition is known as metopism.

Variations of the metopic sutures have been mentioned by several research workers. Keith[1] mentioned that the metopic suture disappears at the end of the first year or in the beginning of second year of life, but Piersol[2] had mentioned that it may close by the end of the fourth year with a faint trace persisting at the lower end. According to Romanes[3], the metopic suture is present at birth but is normally closed by the fifth or sixth year. Only traces of it being left above and below.

Metopism may be present till the age of six years Torgerson[4], and also in old age. Warwick and Williams[5] state that the two halves of the frontal bone begin to unite in the second year and that the suture is usually bilateral by the eight year, but, in a percentage of cases which show some racial variants, the two halves of the frontal bone remain separate, and the metopic suture persists. Hamilton[6] stated that the metopic suture is always present at birth but disappears by the seventh year, while Basmajian[7] claim that the frontal bone is in two halves, at birth these fuse above the second year but in some skulls they remain separate.

Material and Methods: Forty north Indian human crania were studied for this study. Twenty human crania of museum of Rohilkhand medical college Bareilly and twenty human crania of Sri Ram Murti Smarak Institute of Medical Sciences Bareilly were studied. Incidence of metopism was noted in these crania.

Result: In our study metopism was found only in 2 cases (5%), as shown in Fig,1and 2.

Figure No 1. Showing metopic suture

Figure No 2. Showing Metopic Suture

Discussion: Cranial variants have aroused the curiosity of anatomists for many decades (e.g.Le Double[8],It was Wood Jones[9],however who first proposed that the differing incidences of these minor variants which occurred in different races might be useful in anthropological studies. Laughlin & Jorgensen[10] put this idea in practice and in Berry & Berry[11] suggested that a wide range of these variants could be used to calculate a distance statistic between population samples.

This paper is concerned with description and racial & regional incidence of metopic suture, one of the important cranial variant.

Cranial variants like all other variants have been studied by many workers; most of them are recognized only by mention in anatomical text books, being described in terms such as rare or occasionally found. Some variants are consequences of disease or other extrinsic influences[12,13,4];however most of these variants result from normal developmental processes and are genetically determined[11].

Woodjones[15] used data on skull variants in a more systemic comparison number of far eastern group. Berry[16] made a special study of non metrical human cranial variations including the metopism.

In our study metopism was found in two cases (5%) which is higher than the incidence reported in Negro by Bryce[17] (1.20%), Australian by Bryce[17] (1.00%), Indian by Das et al[18] (3.31%) and Indian by Agarwal[19] et al (2.66%), Ajmani[20] et al (3.40%) but lower than the European by Bryce[17] (8.70%), Mongolian by Bryce[17] (5.10%), Scottish by Bryce[17] (1915, 9.50%), European by Romans[3] (up to 8%), Berry[16](0-7.4%) and was equal with the India (Punjabi) by Jit and Shah[21] (1948, 5%,).

Conclusion: Hence the current study provides valuable data from U.P. the largest state of India, and compares the same with data of different global regions. The findings are of considerable racial and regional global significance.

References:

1. Keith A. Human embryology and morphology,6th ed. London :Edward Arnold; 1948.
2. Piersol GA. Human Anatomy, 5th ed. Philadelphia: Lippincott; 1916.
3. Romanes GJ. Cunningham's text book of Anatomy, 11th ed, London: Oxford university press; 1972. p. 133.
4. Torgerson J. Developmental, genetic evolutionary meaning of metopic suture. American Journal of Physical Anthropology. 1951; 9: 193-210.
5. Warwick R and Williams PL. Gray's Anatomy, 36th ed. London: Longmans; 1980. p. 334.
6. Hamilton WJ. Text book of Anatomy, 2nd ed. London: Macmillan and Co; 1976. p. 60.
7. Basmajian JV. Grant's method of Anatomy, 9th ed. New Delhi: S Chand and Co. Ltd: Baltimore: Williams and Wilkins, Co; 1975. p. 451-604.
8. Le Double AF. Variations des Os du Crane.Paris: Vigot; 1975. p. 400.
9. Wood-Jones F. The non-metrical morphological characters of the skull as Criteria for racial diagnosis: Part IV. The non-metrical morphological characters of the Northern Chinese skull. J.Anat. 1933; 68(1): 96-108.
10. Jorgensen JB, Laughlin WS. Isolate variation in Greenlandic Eskimo crania .Acta Genet Stat Med. 1956; 6(1 Part 2): 3-12.
11. Berry AC, Berry RJ. Epigenetic variation in the human cranium. J Anat. 1967; 101: 361-380.
12. Moller-Christensen V, Sandison AT. Usura orbitae (enbra orbitalia) in the collection of

crania in the anatomy department of university of Glasgow. Path Microbiol. 1963; 26: 175-183.
13. Roche AF. Aural exotoses in Australian aboriginal skulls. Ann Otol Rhinol Laryngol. 1964; 73: 82-91.
14. Dorsey GA. Wormian bones in artificially deformed Kwakiutl crania. Am Anthrop. 1897; 10:169-173.
15. Wood-jones F. The non-metrical morphological characters of the skull as Criteria for racial diagnosis: Part III. The non-metrical morphological characters of the skull of prehistoric inhabitants of Guam. J.Anat. 1931; 65(4): 438-45.
16. Berry AC. Factors affecting the incidence of non-metrical skeletal variants. J Anat. 1975; 120 (3): 519-535.
17. Bryce TH. Osteology and Arthrology. In Quain's elements of Anatomy.11th ed, London, Longmans Green; 1915. p. 177.
18. Das AC, Saxena RC And Deo MAQ. Incidence of metopic suture in U.P. subjects. Journal of Anatomical society of India. 1973; 22: 140.
19. Agarwal SK, Malhotra VK and Tewari SP. Incidence of the metopic suture in adult Indian crania. Acta anatomica. 1979; 105:469-474.
20. Ajmani ML, Mittal RK, Jain SP. Incidence of metopic suture in adult Nigerian skulls. Journal of anatomy. 1983; 137 (1): 177-183.
21. Jit I, Shah MA. Incidence of frontal and metopic suture amongst Punjabi adults. Indian medical gazette. 1948;83: 507.