International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2015): 78.96 | Impact Factor (2015): 6.391

Wormian Bones – An Original Research Article

Dr. V. Anitha M.B.B.S., M.S (Anatomy)[1], G. Jaiharish[2], S. Manoj Rishi[3], V. S. Rishwanth[4]

[1]Associate Professor and Head I/C., Department of Anatomy, Kanyakumari Government Medical College

[2, 3]2ND Year M.B.B.S, Kanyakumari Government Medical College

[4]Final Year M.B.B.S., Kanyakumari Government Medical College

Abstract: ***Introduction*** *– Wormian bones may be defined as those accidental or intercalated bones found in the cranium, having no regular relation with its normal ossification centres. They are quite frequent occurrence in human beings and has certain clinical importance.* ***Background and Aim****: Wormian bones were discovered by OLE WORM, PROFESSOR OF ANATOMY, DENMARK. They were given the special name KEYS OF VAULT. The aim of this study is to create awareness among students regarding wormian bone and its clinical significance* ***Materials and methods****: In the present study, nearly 50 skulls (35 full, 15 base) were searched for wormian bones along the sutures in department of anatomy, kanyakumari government medical college, nagercoil.* ***Result****: The incidence of wormian bones in our study was 14% with frequent occurrence in the lambdoid suture.* ***Conclusion****: The study helps in anatomic, forensic and radiological fields to differentiate between skull fractures and wormian bones and its role in identification of certain diseases.*

Keywords: Wormian bones, Keys of vault, Skull fracture

1. Introduction

Wormian bones are irregular isolated bone pieces found in the cranium that appear in addition to the usual centres of ossification of the skull. The wormian bone was discovered by ole worm. The wormian bones resemble bone of the skull and involve both internal and external layers like the cranial vault. They articulate with surrounding bone of the cranium by sutures. The shape of the wormian bone may be round, oval, oblong, triangular, quadrilateral and polygonal.

2. Materials and Methods

Fifty skulls (35 full, 15 base) were studied for wormian bones along the sutures in department of anatomy, kanyakumari government medical college.Dry human adult skulls of unknown sex and without any gross pathology and abnormality was taken. The length and breadth of the wormian bones were measured using thread, scale and divider.

3. Result

Skull With Wormian Bones	7 OUT OF 50 (14%)
Skull Without Wormian Bones	43 OUT OF 50(86%)

Skull With Wormian Bones	*Number of Wormian Bones*
At Lambdoid Suture	3
At Saggital Suture	1
At Lambda	1
At Asterion	1

Wormian bone in a half skull

Wormian bone in skull 1 (along the saggitalsuture)

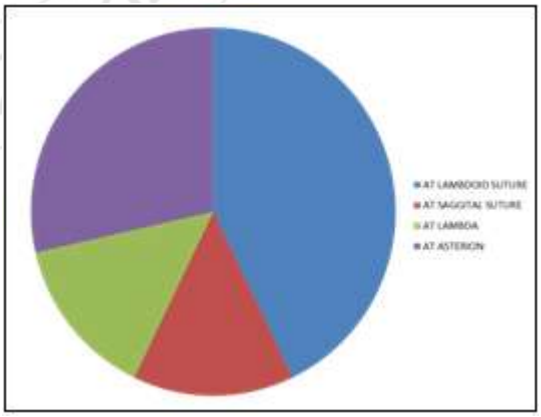

Wormian bone in skull 2 (in the region of lambda)


Wormian bone in skull 3 (along the lambdoid suture)


Wormian bone in skull 4 (along the lambdoid suture)


Wormian bone in the skull 5 (in the region of asterion)


Wormian bone in skull 6 (in the region of asterion)



Occurrence of wormian bones

4. Discussion

The appearance of the wormian bones in the skull is genetically determined in certain population. In some it may result as a result of the metabolic disorders of the mesoderm. **Jeanty et. al.,** (2000) pointed out that the sutural diastasis

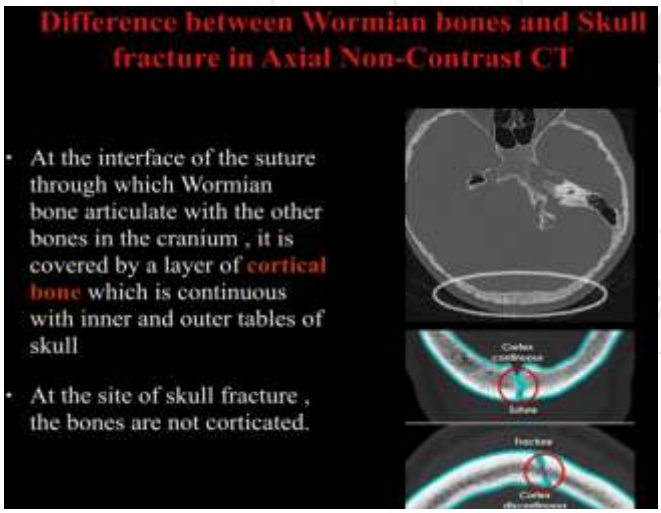
leads to ectopic ossification centres from which the wormian bones develop.

Kaplan et.al., (1991)	Wormian bone is present in both normal and abnormal cases
Jeanty et.al., (2000)	No.of wormian bones depend upon the cranial capacity and suture length
Agarwal et.al., (2006)	Wormian bone present in the anterior fontanelle is called anterior fontanelle bone
Wilczak et.al., (2009)	Incidence of the wormian bone is more in artificially deformed skull

5. Clinical Importance

The physiological cause for the occurrence of the wormian bone is the genetic factor. The pathological condition in which the wormian bone is present are **P**yknodystosis, **O**steogenesis imperfecta, **R**ickets, **K**inky hair syndrome, **C**leidocranial dystosis, **H**ypothyroidism, **O**steopalatodigital syndrome, **P**rimary acro osteolysis, **S**yndrome of down`s (**PORKCHOPS)**

Wormian Bone	*Skull Fracture*
They are found within the suture and occur in specific anatomical location	They can cross a suture and reach the other suture. It can occur anywhere in the cranium
Has serrated margins.	Has smooth margins.
Articulates with the other bones of the cranium through sutures.	Does not articulate with the other bones of the cranium.
Cortex is continuous.	No continuity of the cortex.



6. Conclusion

The presence of the multiple wormian bones may lead to a great difficulty in the posterior approach of the skull. The wormian bones may be misinterpreted as fracture during radiographic studies. So the knowledge of the wormian bone is very important. In the present study, 14% of the skull showed the presence of the wormian bones with frequent occurrence in the lambdoid suture.

References

[1] Saladin, Kenneth (Aug 2006) ; anatomy and physiology; the unity of form and function (4th edition) McGraw- hill.
[2] Gray, henry, warren harmon lewis (1918) anatomy of human body;lea and febiger
[3] Parente k,Mercado – deane, MG;brummund T(2001) radiological case of the month; archieves of the paediatrics and adolescent medicine 155 (6) ; 731-732
[4] Jeanty p silva SR, turner C, prenatal diagnosis of wormian bones, J. Ultrasound med 2000;19;863-869
[5] Diagnosis and interventional imaging. Apr 2013 vol94(4) ; 428-432
[6] Agarwal D, Steinbok P, Cochrane D, Pseudoclosure of the anterior fontanelle by wormian bone in isolated saggital cranio synostosis ; paediatric neurosurgery 2006 ; 42; 135-137
[7] Burrows AM, carusok A, Mooney MP et al ; sutural bone frequency in synostotic rabbit crania.Am J Phys Anthropol 1997; 102;555-663
[8] Kaplan SB,Kemp SS, OH KS, Radiographic manifestation of congenital anomalies of skull. radiol.clin. North AM 1991; 29;195-218
[9] Wilczak CA, Ousley SD, Test of the relationship between sutural ossicles and cultural cranial deformation results from hawikuh, New mexico, AM J Phys, Anthropo, 2009; 13 9(4); 483-493
[10] Barbeini F, Brunor E, Cartolari R, franchitto G, Heyn R, Richli F, Manzi G, An unusually wide human biegmate wormian bone; Anatomy tomographic description and possible significance. Surg Radiol Anat 2008;30;683-687
[11] I.B.Singh Embryology
[12] Tewari P S, Malhotra V K, Agarwal S K, Tewari SP, Pre interparietal bone in man. Anat Anz 1982;152;337-339

Author Profile

DR. V. Anitha M.B.B.S., M.S, Associate Professor and HOD I/C., Department of Anatomy, Kanyakumari Government Medical College. Finished M.B.B.S in Stanley Medical College and M.S (Anatomy) in Madras Medical College. She has Published 6 Journals and has Attended Several Conferences, Workshops, CME and Seminars. Was Awarded the Certificate of Merit from Collector in the Year 2015.