

Complete Non-Fusion of Sacral Lamina - A Case Study

Sushanth¹, Dr. Shishirkumar²

¹Tutor, Department of Anatomy, DM-WIMS Meppadi, Kerala, India

²Assistant Professor, Department of Anatomy, DM-WIMS Meppadi, Kerala, India

Abstract: *The sacrum is a triangular bone which is formed by the fusion of five vertebrae and forms the posterosuperior wall of the pelvic cavity. Developmentally it develops as a typical vertebra. The neural arches meet at the mid dorsal line to form the rudimentary spines. The medial sacral crest presents below a sacral hiatus which is arched and is produced by the failure of the lamina of the fifth sacral vertebra to meet in the median plane. If the laminae are not fused, then the sacral canal will be open. Clinicians need to be aware of such conditions as a number of neurological deficits can occur due to the above said condition.*

Keyword: Anesthesia, Clinicians, Lamina, Sacrum, Vertebrae.

1. Introduction

The sacrum is a triangular bone which is formed by the fusion of five vertebrae and forms the posterosuperior wall of the pelvic cavity. The bone is wedged between two hip bones. Developmentally it develops as a typical vertebra. The neural arches meet at the mid dorsal line to form the rudimentary spines. The medial sacral crest presents below a sacral hiatus which is arched and is produced by the failure of the lamina of the fifth sacral vertebra to meet in the median plane. If the laminae are not fused, then the sacral canal will be open. The spines of the sacral vertebrae are fused to form the medial sacral crest. The hiatus is one of the useful landmarks to give epidural analgesia¹. Non-fusion of all the five laminae of the sacrum is observed posteriorly which will present a midline gap². This condition is observed in spina bifida. These kinds of anatomical variations can cause lower backache³ due to compression of the nerve roots and also may cause the failure of epidural analgesia⁴ procedure.

2. Materials and Methods

During routine osteology classes for the first MBBS a sacrum was observed in which the sacral canal was absent.



Image 1: Absence of sacral canal due to non fusion of lamina

3. Discussion

The sacrum develops from the fusion of five vertebrae. After puberty the sacral vertebrae start fusing with each other. The primary centers which form the each half of the vertebral arch fuse posteriorly to form a complete sacral canal. Any defect in the formation leads to incomplete formation of sacral canal. In the present study one sacrum was found to have unfused lamina having an open sacral canal. The knowledge about the level of the sacral hiatus is important because it is useful in caudal analgesia procedure. The knowledge of structural modification is essential. In clinical practice it is very important because the success of the caudal epidural anesthesia depend upon such variations. Spina bifida occulta or cystica can be accompanied and

neurological deficits can be present in such cases⁵. Nutritional factors and environmental factors may play a major role in such deformities. Maternal Diabetes during pregnancy has been observed to cause sacral agenesis⁵.

4. Conclusion

Clinicians need to be aware of such conditions and their frequency in the local populations because the success of caudal epidural anaesthesia and analgesia depends on the anatomical variations of sacral hiatus. Neurological symptoms may be caused due to such anomalies. There is a lot of future scope for such studies because local environmental factors and also nutritional factors are responsible for such anomalies which can be identified by further studies.

References

- [1] Letterman GS, Trotter M. Variations of male sacrum; their significance in caudal analgesia. SurgGynaecolObstet 1944; 78: 551-5.
- [2] Sekiguchi M, Yabuki S, Satoh K, Kikuchi S. An anatomic study of the sacral hiatus: a basis for successful caudal epidural block. The Clinical Journal of Pain 2004; 20: 50-1.
- [3] High sacral hiatus with non-fusion of lamina of first sacral vertebrae: A case report Vishal K., Vinay K.V., Remya K., Arunachalam Kumar & Shishir K. Department of Anatomy, K. S. Hegde Medical Academy, Mangalore, Karnataka, India.
- [4] Das S, Paul S. Spina bifida with higher position of sacral hiatus: a case report with clinical implications. Bratisl Lek Listy 2007; 108: 467-9.
- [5] A.K. Datta, Essentials of Human Embryology 6th Edition 2010; 97, 278, 279.

Author Profile



Mr. Sushanth N.K. has completed his MSc in Anatomy from Dr.A.L.M.P.G.I.B. Medical Sciences Chennai. He is also pursuing his PhD in Yenepoya Medical College Deralakatte, Mangalore. He is presently working as a Tutor in the Department Of Anatomy, DM-WIMS Meppadi, Kerala, India



Dr. Shishirkumar has completed his MBBS from KLE'S JNMC Belgaum and has completed his M.D in Anatomy from K.S.Hegde Medical Academy, Deralakatte, Mangalore. He is presently working as an Assistant Professor in the Department Of Anatomy, DM-WIMS Meppadi, Kerala, India