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RESEARCH ARTICLE

NON CANALIZED SACRUM WITH ABSENT SACRAL HIATUS- A CASE REPORT WITH ITS CLINICAL SIGNIFICANCE

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ABSTRACT

Variations in the morphology of sacrum are commonly reported in literature. The present case report describes a rare case of completely non–canalized sacrum or spina bifida occulta with complete midline gap in the posterior aspect of the canal, observed during regular osteology classes for the first year medical students of Yenepoya medical college, Mangalore. These anatomical variations are of clinical significance to orthopaedicians and anaesthetists as this may lead to failure in sophisticated clinical procedures like trans-pedicular screw fixation and caudal epidural block and may injure the neural structures of the canal.

INTRODUCTION

Study on the morphological variations of sacral hiatus and the dorsal wall of sacral canal is important due to its clinical implications (Nagar 2004). The posterosuperior aspect of the dorsal surface of sacrum bears a raised, interrupted, median sacral crest with three or four spinous tubercles which represent fused sacral spines. Below the fourth tubercle in the posterior wall of the sacral canal there is an arched caudal opening called sacral hiatus. This hiatus is produced by the failure of the 5th sacral vertebral laminae to meet in the median plane. The dorsal wall of the sacral canal may be variably deficient, due to imperfect development of laminae and spines (Standring 2005) leading to highly placed midline gap or complete midline gap (Kumar 2012). The non fusion of laminae of all the sacral vertebrae leads to a development anomaly Spina bifida occulta (Senoglu *et al.,* 2008) wherein all the contents of sacral canal are exposed. These anatomical variations may lead to failure in clinical procedures like trans-pedicular screw fixation and caudal epidural block and increase the risk of damaging the neural structures in the canal. (Kumar 2012) Thus the Anaesthetists and Orthopaedicians should consider these variations of sacral canal and hiatus before performing sophisticated clinical procedures.

Case report

We present to you a case of complete non canalized sacrum (total spina bifida occulta) which was found during routine osteology class for the first year medical students of Yenepoya medical college, Mangalore. The bone was thoroughly studied, photograph was taken (Figure 1) and following observations were made. In this Sacrum, posterior laminae of all the sacral vertebrae were not fused exposing the dorsal surface of the body of all the sacral vertebrae, absence of sacral hiatus was seen, absence of sacral spines were noticed, sacral foramina opened into sacral canal. No other abnormalities were observed.

DISCUSSION

During embryonic period failure of neural vertebral arches to fuse results in a major defect-spina bifida. The incidence of this vertebral defect ranges from 0.04% to 0.15%, and it occurs more frequently in girls than boys. Most cases of spina bifida (80%) are "open" and covered by a thin membrane. (Moore and Dalley 1995) “Spina bifida occulta” a neural tube disorder is clinically important as it may be associated with other neural tube disorders like spina bifida cystica, meningocele, meningomyelocele and rachischisis, resulting in neurological deficits. The vertebrae and the defect in its closure can be visualised by 12 weeks of gestation by ultrasonography. A new treatment for this defect is to perform surgery in utero at approximately 28 weeks of gestation. The baby is exposed by caesarean section, the deficit is repaired and the infant is placed back in the uterus. (Sadler 2009) The present case may help the radiologists, obstetricians and paediatric neurosurgeons to consider this congenital defect during the ante natal check-up of pregnant women and hence their combined effort can prevent the complications caused due to this defect. The

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Figure 1. Non-canalized sacrum

anatomy of sacrum is also important for the complicated surgeries like pedicle screw fixation. (Basaloglu *et al.,* 2005) In the presence of spina bifida occulta, screw fixation especially in the pedicles of S1 vertebra may remain as a big challenge for the orthpopaedicians and neuro surgeon. (Das and Paul 2007) Willis RJ in his book mentions that in complete failure of fusion of lamina also called 'spina bifida' or 'non-canalized' sacrum; there is no bony area available for attachment of muscles, which lead to weakness of muscles and low backache. (Willis 1988). Location of the sacral hiatus is important for caudal epidural block for injecting analgesics and anaesthetics in epidural space for various clinical procedures. (Senoglu *et al.,* 2005) 25% of failure rate has been observed even by expert clinicians to reach the epidural space using various techniques. (Chen *et al.,* 2004) Hence authors have worked to determine the landmark of the hiatus by constructing morpometrically an equilateral triangle between two superolateral sacral crests and apex of the sacral hiatus to reach caudal epidural space. (Senoglu *et al.,* 2005) Presence of the non canalized sacrum with absent sacral hiatus may lead to difficulty in locating epidural space and may injure the neural structures which are otherwise covered by complete bony sacral canal.

Conclusion

The present case may help the anaesthetists, orthopaedicians and neurosurgeons to consider the congenital defects before undertaking any clinical procedure and prevent the serious complications that may occur and may also help the radiologists, obstetricians and paediatric neurosurgeons to consider this congenital defect during the ante natal examination of pregnant women and hence their combined effort can prevent the complications caused due to this defect.

REFERENCES

Basaloglu H, Turgut M, Taser FA, Ceylan T, Basaloglu HK, Ceylan AA. 2005. Morphometry of the sacrum for clinical use. *Surgical radiological anatomy*; 467-471.

Chen PC, Tang STF, Hsu TC, Tsai WC, Liu HP, Chen MJL, *et al*. 2004. Ultrasound Guidance in Caudal Epidural Needle Placement. Anesthesiology; 101:181 –184.

Das S, Paul S. 2007. Spina bifida with higher position of sacral hiatus: a case report with clinical implications. Bratisl Lek Listy; 108: 467-9.

Vishal K, Vinak K.V,Remya .K, Arunachalam Kumar& Shishir K. 2012. High Sacral Hiatus with non fusion of lamina of first sacral vertebrae: A Case report. NUJHS; 29(4):60-62.

Moore KL, Dalley AF. 1995. The Developing Human, Clinically Oriented Anatomy.8th Edn, New York: Lippincott Williams and Wilkins; 350.

Nagar SK. 2004. A study of sacral hiatus in dry human sacra. Journal of Anatomical Society of India; 53:18-21.

Sadler TW. 2009. *Langman's Medical Embryology*. 11th Ed.India; Wolter's Kluwer, 302-303.

Senoglu N, Senoglu M, GumusalanY. 2008. Total Spina bifida occulta of the Sacrum.case report. *International Journal of Anatomical Variations*; 1: 26–27.

Senoglu N, Senoglu M, Oksuz H, Gumusalan Y, Yuksel KZ, Zencirci B, *et al*. 2005. Landmarks of the Sacral hiatus for caudal epidural block: an anatomical study. *Br J Anaesthesia*; 95(5): 692–695.

Standring S. 2005. Grays Anatomy. 40th Edn: the anatomical basis of clinical practice. London: Elsevier Churchill Livingstone. 724-728.

Willis RJ, 1988. Neural blockade in clinical anaesthesia and management of pain. In:Cousins MJ, BridenBaugh, PO.Caudal epidural block., 3rd Edn, Philadelphia: JB Lippincott; 361.

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