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AGENESIS OF THE DORSAL WALL OF SACRUM: A CASE STUDY IN DRY BONES

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ABSTRACT Sacrum is a triangular bone wedged between two innominate bones which forms the caudal region of the vertebral column[1,2,3]. It is formed by fusion of five sacral vertebrae. Base placed superiorly which articulates with 5th lumbar vertebra and apex placed inferiorly articulates with coccyx [1,2,3]. Pelvic surface is concave and dorsal is convex encloses a triangular sacral canal [1,2,3]. In the current study we present sacrum with agenesis of dorsal wall and first sacral lamina showing incomplete fusion thus forming open sacral canal posteriorly. The knowledge of this variation may be of importance in clinical conditions for orthopaedic surgeons, neurosurgeons, radiologists and anthropologists.

KEYWORDS : Agenesis, hiatus, ossification, sacrum, vertebrae.

INTRODUCTION:-

Sacrum is triangular bone formed by fusion of 5 sacral vertebrae and forms the postero-superior wall of the pelvic cavity, wedged between two innominate bones. Its base projects superiorly and anteriorly which articulates with the 5th lumbar vertebra to form a prominent sacro-vertebral angle, while truncated apex points inferiorly and articulates with the coccyx[1,2,3,4,5].

Sacrum ossifies by appearing of primary centres for centrum and each half of vertebral arch between 10th & 20th week of IUL. For costal element primary centres appear at the time of 6th & 8th month of IUL. It usually consists of five un-fused vertebrae which begin to fuse between 16-18 years of age and are usually completely fused to form a single piece of bone by 34 years of age[3,4,5]. Its dorsal surface is convex and narrower than the pelvic surface.

In the midline is the middle sacral crest, surmounted by three or four tubercles representing the spinous processes of the upper three or four sacral vertebrae [4,5,6]. The floor of the groove is formed by the united laminae of the corresponding sacral vertebrae.

The laminae and spinous process of the 4th&5th sacral vertebrae fail to meet in the mid line creating a deficiency known as the sacral hiatus in the posterior wall of the sacral canal[1,2,3,4]. The hiatus is covered by skin, a subcutaneous fatty layer and the sacro-coccygeal membrane. Sacral hiatus has been utilized for administration of epidural anaesthesia in obstetrics as well as in orthopaedic practice for treatment and diagnosis[5,6,7].

MATERIALS AND METHODS:-

Total of 50 sacrum of both sex (male 30 &female 20)which are available in the Dept. of Anatomy, Nri Medical College. The dorsal wall of sacrum were studied and agenesis of the dorsal wall noticed and those sacra were photographed.

OBSERVATIONS:-

Out of the 50 sacra taken for the study 3 of them showing dorsal wall agenesis and the lamina of first sacral vertebra was present but showing incomplete fusion Remaining features of the sacrum were normal.

Fig1:- The Dorsal Aspect Of 1st Sacrum Showing Complete Agenesis Of The Dorsal Wall

Fig2:- The Dorsal Aspect Of 2nd Sacrum Showing Complete Agenesis Of The Dorsal Wall

Fig3:- The Dorsal Aspect Of 3rd Sacrum Showing Partial Agenesis Of The Dorsal Wall

SAFSV :- Superior articular facet of sacral vertebra
SF :- Sacral foramina
ILFSV :- Incomplete Lamina of First Sacral vertebra

DISCUSSION:-

In this case study sacrum shows agenesis of dorsal wall because of failure of fusion of sacral laminae [1,2,7]. Sound knowledge of position, shape and the morphology of sacral canal are important for epidural anaesthesia[6,7]. Surgical treatment of sacral lesions requires understanding of the underlying anatomy and various morphometric parameters of sacrum. Significant lapses have been made towards the understanding of the sacral region by both anatomists and surgeons [4,5,6], there is still much to be learned with advances in surgical methods and instrumentation in the field of spinal surgery, need to better understand the anatomy of this region[6,7].

CONCLUSION:-

It's a rare variation having knowledge about this may be useful for orthopaedic surgeons, neurosurgeons, radiologists and anthropologists and during caudal epidural anaesthesia [6,7]. Understanding of these variations may improve the reliability of caudal epidural block.

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