

RESEARCH ARTICLE

Sacralization of fifth lumbar vertebra

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ABSTRACT

Sacralization is defined as addition of sacral elements by the fusion of fifth lumbar vertebra or first coccygeal vertebrae or both. The incorporation of the fifth lumbar vertebra with the sacrum may be unilateral or bilateral, producing partial or complete sacralization. Complete sacralization consists of complete bony union of abnormal transverse processes of fifth lumbar vertebra and sacrum. Incomplete sacralization shows a well-defined joint line between the transverse process and sacrum. Sacralization of the fifth lumbar vertebra has come into considerable prominence on account of the fact that radiography has thrown its beam of light upon a condition about which previously very little was known and which most certainly undiagnosable without an X-ray examination. During routine study of bones few sacral bones were observed with six bodies and five sacral foramina

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INTRODUCTION

Lumbo-sacral region is one such region where so many puzzling stresses and strains exists, which renders the question more than ordinary interest. Sacralization of the fifth lumbar vertebrae can be of two types- Frank's sacralization and Occult sacralization. Occult sacralization described by a high sacrum in the pelvis and the spinous process of the last lumbar vertebra may be with or just below the iliac crests. Occult sacralization has been described by O'Connell 1951 for the first time. The lumbar spine shows five vertebrae, but the sacrum may be composed of six vertebral segments. The number of vertebrae in sacrum may be increased by fusion of fifth lumbar vertebra or first coccygeal vertebra or both. However sacrum is mainly formed by fusion of five sacral vertebrae.

MATERIALS AND METHODS

In the present study 50 sacrum were examined in the Department of Anatomy at Apollo institute of medical sciences and research, Hyderabad. All the sacral bones were observed for the presence of number of sacral elements, sacral foraminae and spinous processes.

Observations

Total of 50 sacral bones were observed and the results were tabulated. Total 5 sacral bones (10%) showed sacralization with fifth lumbar vertebra, out of which 2 bones were seen to be having unilateral sacralization where as 3 were with bilateral sacralization.

Table 1 Unilateral and Bilateral sacralization observed in the present study

Sacralisation	Number of bones	Percentage
Unilateral	2	4%
Bilateral	3	6%

Anterior and posterior views of sacral vertebrae showing Unilateral Sacralization on left side.



Anterior and posterior views of sacral vertebrae showing Bilateral Sacralization.



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DISCUSSION

Complete sacralization consists of a complete body union between the abnormal transverse process and the sacrum. Incomplete sacralisation shows a well defined joint line between the process and the sacrum. Both forms may be either unilateral or bilateral. The complete bilateral sacralization varies into a sixth sacral vertebra and cannot be distinguished except by the number of other vertebrae present.

In 1984, Castellvi *et al*– proposed a system of categorization for LSTV (Lumbo Sacral Transitional Vertebrae). They proposed 4 specific types of LSTV variants. Present study showed sacralization in 10 % of cases which correlate with the observations done by Chet Savage (7%, 2005). Magora & Schwartz found 20.8% sacralization in his study. Sacralization was found in 6.2 % cases by Peter *et al*.

Table 2 Comparison of present study observation with previous studies.

	Chest Savage	Magora & Schwartz	Peter et al	Present study
Sacralisation	7%	20.8%	6.2%	10%

Unilateral and bilateral sacralization observed in present study was also compared with the previous study done by Brailsford and the observations described in the Bustani dictionary.

Table 3 Comparison of Unilateral and Bilateral cases

Sacralisation	Bustani	Brailsford	Present study
Unilateral	9.4%	3.4%	4%
Bilateral	4.1%	4.7%	6%

Sacralization is not related to low backache, it can remain asymptomatic for many years, however sometimes it gives rise to pain which begins slowly and gradually gets worse which may be due to-

- 1) Actual pressure on nerve / nerve trunks
- 2) Ligamentous strain

- 3) Compression of soft tissues between bony joints
- 4) By an actual arthritis if a joint is present
- 5) By bursitis if a bursa is present.

CONCLUSION

Sacralization is associated with low backache, disc bulge / herniation, cervical ribs and Bertolotti's syndrome. Presence of cervical rib may be a clue to the existence of sacralization or vice-versa. In patients with cervical or lumbar pain, this association may be helpful for differential diagnosis before applying advanced diagnostic techniques. In conclusion, research work can further be initiated towards validating and standardizing the results of present study for clinical and preclinical studies.

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