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Biomechanics of lumbosacral region in transitional vertebra

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Abstract

Background: Lumbosacral transitional vertebra (LTSV) is a congenital development anomaly which by definition is either sacralization of L5 vertebra or lumbarization of S1 vertebra. In the current study we intend to predict if transitional anatomy leads to altered biomechanics by measuring the various angles in MR sagittal lumbosacral spine sequence in patients with and without LTSV and whether these angles could be used as a reliable method to predict transitional anatomy and thus leading to better patient management. The objectives of our study are to compare various lumbosacral angles between the patients with and without lumbosacral transitional anatomy and analyse if there is a significant difference between the two groups, to study the various previously known predictive parameters for transitional anatomy and compare these parameters with the lumbosacral angles and to study whether there is an association with degenerative changes, sacro-ilitis and spinal canal stenosis in patients with LTSV.

Methods: The MRI database of our institution will be searched for examinations of the lumbar spine performed in adults since Jan 2019. 100 cases containing LTSV would be analysed and compared with 100 controls with normal lumbosacral anatomy. Sacral inclination angle (SIA), lumbosacral angle (LSA), sacral horizontal angle (SHA), lumbar lordosis angle (LLA), segmental lumbar lordotic angle SLLA L3-S1 will be measured in both the groups. Various spinal canal diameters would be measured. The presence of degenerative changes, scaroilitis, spinal canal dimensions and presence/absence of other known transitional anatomy predictors would be recorded in a preformed proforma. The mean and standard deviation of all the angles in cases and controls would be calculated and compared with each other in order to identify any significant difference in these angles between patients with/without transitional vertebra.

Results: Awaited.

Conclusions: Awaited

Key words: Lumbosacral transitional vertebra, lumbosacral angles, spinal canal diameter, degenerative changes