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Orientation of L4 Coronal tilt relative to C7 Plumb line as a predictor for Postoperative Coronal Imbalance in patients with Degenerative Lumbar Scoliosis

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The design of the study is case-control. To evaluate the impact of preoperative coronal patterns related on the relationship among orientation of L4 coronal tilt and C7 plumb line on immediate postoperative coronal imbalance among Degenerative Lumbar Scoliosis (DLS) patients. Although lumbosacral fractional curves have long been stressed in DLS correction surgery, there is scarcity of literature focusing on preoperative coronal pattern related to the relationship among orientation of L4 coronal tilt and C7 plumb line and its impact on immediate postoperative coronal imbalance among DLS patients. A consecutive series of DLS patients who had deformity correction surgery via posterior-only technique was reviewed. A total of 77 DLS patients who underwent posterior spinal corrective surgery were classified preoperatively based on the relationship between L4 coronal tilt and C7 plumb line: 1. L4 coronally tilts toward C7 plumb line - Coronal consistency pattern, 2. L4 coronally tilts opposite C7 plumb line - Coronal opposition pattern. Global coronal malalignment (GCM) of more than or equal to 20 mm on either side was defined as coronal imbalance. Whole-spine standing radiographs of both pattern groups were evaluated preoperatively and postoperatively. There were 40 patients

with coronal opposition pattern and 37 patients with coronal consistency pattern. When compared to patients with coronal opposition pattern, patients with coronal consistency pattern had lower amount of GCM correction ($P = 0.013$), significantly higher postoperative GCM ($P = 0.028$), and higher incidence of postoperative coronal imbalance is $P = 0.001$. Further logistic regression analysis revealed coronal consistency pattern was related with increased odds of postoperative coronal imbalance (odds ratio: 5.981; 95% confidence interval 2.029–17.633; $P = 0.001$). Following posterior long correction surgery, DLS patients with a preoperative coronal consistency pattern were more likely to experience acute postoperative coronal imbalance..

Speaker Biography

Jiandang Zhang has been a spine expert for more than 15 years. He has been a spine fellow in several top spine centers in the United States for more than 4 years, and has successfully completed a postdoctoral research fellowship. He is creative in spine research and surgery, and has published many peer-reviewed papers. With deep understanding of spine disease, especially in adult Degenerative Scoliosis, he now is at a leading position.

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