

Different Safe Zone of the Minimally Invasive Lateral Approach in Asian Ethnicity: A Study Based on Korean Population

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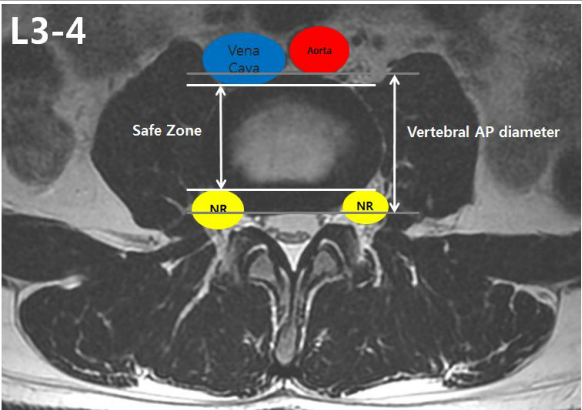


Introduction

The lateral approach to the lumbar spine has the advantages of improving accessibility to anterior spinal body that facilitates minimum invasive treatment by transpoas approach. By using the expandable retractors that are positioned under fluoroscopic guidance, the lateral approach provides direct vision of the operative field; although it is narrow than the vision of standard open anterior approach. Risks of this technique include injury to the exiting nerve root and retroperitoneal vessels. Herein, authours conducted morphometric analysis, using magnetic resonance imaging (MRI) studies of the lumbar spine among Korean population.

Methods

Fifty one lumbar spine MRI studies were reviewed from patients treated for various spinal pathologies. The measured intervertebral segments were divided into group 1 (normally aligned vertebrae and disc spaces, n=211) or group 2 (degenerative spondylolisthetic segments, n=26). Axial MR images were used to measure: the vertebral endplate anterior-posterior diameter, the overlap between the ventral root and the posterior margin of the vertebra, and the overlap between the retroperitoneal large vessels and the anterior edge of the vertebra. The result also compared to the result of the previous reports.



The location of nerve roots, aorta and vena cava at the level of L3/4

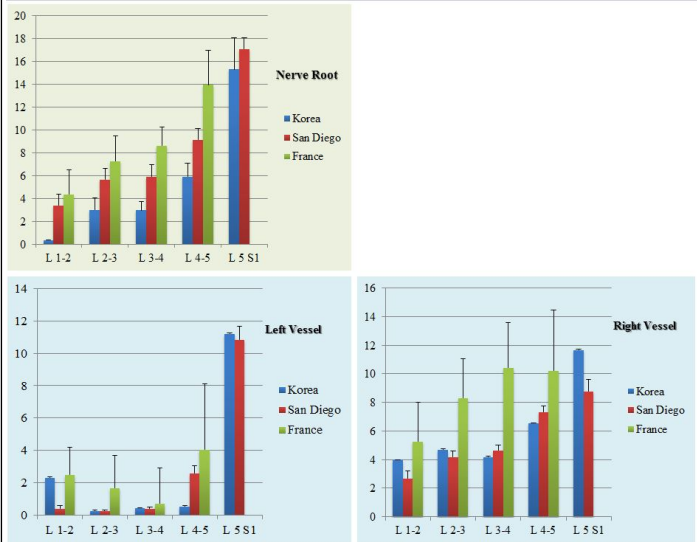
Results

The safe zone between the adjacent neuro-vascular structures and the vertebral body endplate gradually narrowed from L1–L2 to L5–S1, and was observed wider in left side than right side. There were no significant differences in the position of the nerve roots, or retroperitoneal vessels, between group 1 and group 2 patients. The result of safe zone among Korean was more wider than the previous reports among European and American.

Conclusions

The safe corridor for the lateral approach to perform the discectomy and interbody fusion narrows from L1–L2 to the L5–S1 level, and more wider zone achieves by left approach in Korean population. The safe zone is also changed by the ethnicity, more wider zone in Asian than European and American.

Different of nerve roots and retroperitoneal vessels according to the different studies

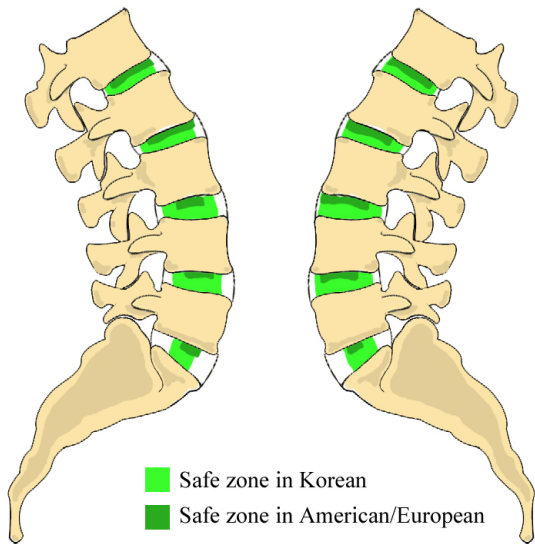


The location of nerve root, left and right vessel were significantly smaller in Korean compared to American (San Diego) and European (France)

Schematic Images of Different Safe Zone of DLIF among Korean and American or European

A) Right approach

B) Left approach



Different safe zone of the minimal invasive lateral approach according to the ethics was observed. Note the more wider safe zone in left approach

Learning Objectives

The safe zone between the adjacent neuro-vascular structures and the vertebral body endplate gradually narrowed from L1–L2 to L5–S1, and was observed wider in left side than right side. The safe zone area was differently checked according to the ethics.

References

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