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Morphological trends of cervical alignment and the correlation between range of motion (ROM) on cervical spine x-ray and pre-operative outcomes in 298 patients underwent cervical spinal surgeries

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There have been a few studies about cervical alignment up to now. However, it is still needed to understand comprehensively the morphological trends of cervical alignment and its range of motion (ROM) on x-ray images. The aim of this study is to identify the morphological trends of cervical alignment and the correlation between ROM on cervical spine x-ray and pre-operative outcomes in the patients underwent cervical spinal surgeries. Total 354 patients who had cervical spinal surgeries from January 1st, 2013 to December 31st, 2014 were included in this study and 56 patients were excluded because they didn't have all types of x-ray images (flexion, extension and lateral positions), T1 vertebral body could not be detected or vertebral fracture was found on x-ray images. They were divided into 4 groups based on cervical alignment types (lordotic, straight, sigmoid and kyphotic types). We measured cervical alignment parameters and clinical outcomes preoperatively. Especially ROM based evaluations were conducted between radiographical variables and clinical outcomes. Radiographical measurement was performed by 2 independent researchers. IBM SPSS Statistics version 22 was used for correlation analysis and one-way analysis of variance (ANOVA). There were significant differences among 4 groups for whole cervical lordosis (WCL) ROM, lower cervical lordosis (LCL) ROM and cervical tilt (CT) ROM ($p < 0.001$, $p < 0.000$ and $p < 0.028$, respectively) and there were significant correlation between WCL ROM and VAS shoulder/neck disability index (NDI) ($p < 0.002/0.014$), LCL ROM and VAS shoulder/NDI ($p < 0.002/0.015$), CT ROM and VAS shoulder/NDI ($p < 0.003/0.001$). This research is a part of cervical alignment big data accumulation and it was identified that cervical ROM and pre-operative clinical outcomes were correlated and also 4 morphological cervical types have each ROM trend. However, x-ray image has several limitations in evaluating pain or disability.

Biography

Il-Tae Jang is the Founder and Chairman of Nanoori Hospital (Spine and Joint). His special areas of interest is spinal diseases and geriatric spinal diseases. He has completed his Bachelor's degree and PhD in Medicine from Korea University. He is an adjunct Professor in the Neurosurgery Dept. in the Medical School of Korea, Ewha Women's and Yonsei University. He acquired the educational commission for foreign medical graduates (ECFMG) certification, and became an Executive Director of the Korean Neurosurgical Society (KNS) and the Korean Spinal Neurosurgery Society (KSNS).

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