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Radiological features of cervical kyphoscoliosis

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Background: We occasionally experience cervical scoliosis when we treat cervical kyphosis and dropped head syndrome (DHS) although few attentions are paid on the coronal malalignment. The purpose of this study was to investigate the radiological features of cervical kyphoscoliosis.

Methods: Between 2023 and 2024, 18 patients (6 males, 12 females, mean age of 74.5 years old) who underwent cervical correction surgery were enrolled. Whole spine radiographs in the standing position were taken. Cervicomandibular angle (CMA), thoracolumbar Cobb angle and C7-CSVL were assessed in the coronal plane. In the sagittal plane, local kyphosis and anterior vertebral slippage were evaluated. We also evaluated the causative level of the cervical scoliosis and the uncovertebral joint OA using coronal CT images. We investigated the relations between the coronal and the sagittal radiological parameters. Moreover, the improvement of CMA, thoracolumbar Cobb angle and C7-CSVL after correction surgery was investigated.

Results: Fourteen of 18 patients (77.7%) had cervical scoliosis. Preoperative CMA (7.3±3.5°) improved to 2.9±1.7° after surgery. The causative level of the cervical scoliosis were; C2/3 (0%), C3/4 (46.2%), C4/5 (23.1%), C5/6 (61.5%) and C6/7 (30.8%). The concordance between the causative level and each radiographic parameters were; local kyphosis (13.6%), anterior vertebral slippage (27.3%) and the uncovertebral joint OA (90.9%). Thoracolumbar scoliosis coincided in 11 patients (61.1%). Thoracolumbar Cobb angle (14.8±8.9) and C7-CSVL (23.5±15.9 mm) improved to 10.7±9.8° and 15.4±13.1 mm respectively after surgery.

Discussion: Segmental scoliosis was common in C3/4 and C5/6 and was likely accompanied by the uncovertebral joint OA. When performing correction surgery for cervical kyphoscoliosis, coronal alignment should be focused on as well as sagittal alignment, and it is suggested that correction of the coronal plane might contribute to improvement of thoracolumbar scoliosis.