

Surgical Strategy for Severe Cervical Deformity Patients with Difficulty of Horizontal Gaze

Background and Objects

Severe cervical kyphotic deformity causes significant impairment due to the inability to gaze horizontally and problems with mastication and swallowing. Thus, cervical reconstruction surgeries in these patients are important, however, surgical strategy and its goal still remains to be argued. We prospectively reviewed the results of cervical reconstruction surgery for the patients with difficulty of horizontal gaze.

Methods

Fifteen cervical deformity patients were divided into following three groups by the value of the sagittal vertical axis (SVA). Group Neg: $SVA < 0$, Group Nor: $0 < SVA \leq 40$, Group Pos: $SVA > 40$.

The values of pre- and post op. of the SVA, C-SVA, T1 slope, C2-7 angle were compared and analyzed among each group. Furthermore, the extent of fusion and distal junctional kyphosis (PJK) was analyzed. The p value of < 0.05 was considered statistically significant.

Results

SVA was changed from -46 to 20 ($p < 0.05$) in Group Neg, from 35 to 40 in Group Nor (N.S.), and from 110 to 50 in Group Pos ($p < 0.05$), respectively. T1 slope was changed from 15.5 to 27.3 (Group Neg: $p < 0.05$), from 29.6 to 33.2 (Group Nor; N.S.), from 65.3 to 39.6 (Group Pos; $p < 0.05$), respectively. C2-7 angle from 59.3 to 2.9 (Group Neg: $p < 0.05$), from 55.9 to 1.9 (Group Nor: $p < 0.05$), from 72.5 to 4.5 (Group Pos; $p < 0.05$).

In Group Neg, the extent of fusion was from C2-C7 was in 3 patients, from C3-C7 was in one patient, and from C2-T2 was in two patients. There was no DJK in Group Neg, but C2/3 local kyphosis was progressed in one patient fused from C3-C7. In Group Nor, the extent of fusion was from C2-C7 was in 3 patients, from C3-C7 was in 3 patient, and from C2-T2 was in one patients. There was no DJK in Group Nor. In Group Pos, all of the three patients of their dropped head were caused and diagnosed by thoracic kyphosis and/or thoraco-lumbar deformity, thus, the extent of fusion was from T4-T10 was in 2 patients, from T6-SAI was in one patient.

Conclusions

Cervical deformity surgery improves entire spinal alignment. And it is important to diagnose and analyze the primary driver and cause of cervical deformity and/or dropped head. The key among the parameters would be T1 slope and when T1 slope become normalize, cervical sagittal imbalance would be normalized and it would be acceptable that the cervical lordosis to be neutral.