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RELATIONSHIPS BETWEEN T1 SLOPE AND KYPHOTIC ALIGNMENT CHANGE AFTER LAMINOPLASTY IN PATIENTS WITH CERVICAL OSSIFICATION OF LONGITUDINAL LIGAMENT

Introduction/ Aim

To analyze the relationships between T1 slope and kyphotic alignment change after laminoplasty in patients with cervical OPLL

Materials and Methods

Consecutive 64 patients who underwent cervical laminoplasty for OPLL were enrolled. Cervical spine lateral radiography in neutral, flexion, and extension were taken before surgery and at 2-year follow-up. Depending on lateral radiograph of the cervical spine, the authors measured C2-7 Cobb angle, cervical range of motion (ROM), T1 slope, neck tilt and C2-7 sagittal vertical axis (SVA) preoperatively and postoperatively at 2-year follow-up. Patients were divided into 2 groups according to the preoperative T1 slope, and postoperative cervical alignment change was compared according to the preoperative T1 slope. The incidence of postoperative kyphosis and loss of cervical lordosis (LCL) were also evaluated at 2-year follow-up. The authors investigated the relationships between postoperative cervical alignment change and such preoperative variables as age, T1 slope, cervical ROM, C2-7 SVA, and T1 slope minus C2-7 Cobb angle (T1S-CL).

Results

Preoperative T1 slope was divided into 2 groups based on 50th percentiles. The range of T1 slope was 23.2° to 38.7° in patients with higher (upper half) preoperative T1 slope, and 8° to 22.9° in patients with lower preoperative T1 slope. Patients with higher preoperative T1 slope had more lordotic preoperative cervical alignment ($P=0.001$) and more postoperative LCL ($P=0.03$). In multiple linear regression analysis, higher T1 slope ($B=0.414$, $P=0.04$) and lower T1S-CL ($B=-0.412$, $P=0.03$) were significantly associated with the more postoperative LCL. Even though these results, postoperative kyphosis was not more frequently occurred in patients with higher T1 slope.

Discussion

Patients with higher T1 slope had more lordotic curve before surgery and showed the more LCL after surgery at 2-year follow-up. However, there was no difference in the occurrence of postoperative kyphosis between the patients with higher and lower preoperative T1 slope.

Conclusion

After laminoplasty in patients with cervical OPLL, patients with higher T1 slope tended to have kyphotic alignment change, but not the direct causality to postoperative kyphosis.