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INFLUENCE OF THE TOTAL SPINAL ALIGNMENT ON THE INCIDENCE OF POSTOPERATIVE CERVICAL MALALIGNMENT IN CERVICAL SPONDYLOTIC MYELOPATHY PATIENTS

Introduction

The purpose of this study is to clarify the influence of total spinal alignment on the incidence of cervical malalignment after posterior decompression surgery in cervical spondylotic myelopathy (CSM) patients.

Methods

We performed posterior cervical decompression for 117 cases of CSM (85 male and 32 female, a mean age of 67.8 years) and followed at least one year (averaged 2.6 years). Cervical and total spinal lateral radiograms were examined before surgery and at final follow up. Cervical alignment were categorized into four types: lordosis (type L), kyphosis (type K), sigmoid curve (type S), and reversed sigmoid curve (type R), and type K, S and R were defined as malalignment. The relation between cervical alignment and sagittal parameters of total spine were analyzed.

Results

Preoperatively, there were 78 cases of type L, 15 type K, 21 type S and three type R, and at follow-up, there were 63 type L, 22 type K, 24 type S and 11 type R, respectively. At final follow-up, CL was significantly smaller in type K ($-6.8 \pm 10.9^\circ$), S ($12.4 \pm 9.6^\circ$) and R ($9.9 \pm 10.6^\circ$) than type L ($22.9 \pm 9.2^\circ$, $p < 0.01$), and T1 slope was also significantly smaller in type K ($19.1 \pm 6.2^\circ$), S ($26.0 \pm 6.4^\circ$) and R ($26.6 \pm 6.9^\circ$) than type L ($34.3 \pm 8.6^\circ$, $p < 0.01$). There was significant correlations between CL and T1 slope ($R = 0.68$, $p < 0.01$) at final follow-up. On the other hand, no significant correlation was shown between CL and TK, LL or SS. In the case with preoperative type L, T1 slope in the case which developed malalignment during follow-up decreased $4.0 \pm 9.5^\circ$, whereas T1 slope in the case which kept type L increase $2.8 \pm 6.6^\circ$ ($p < 0.01$), and decrease of T1 slope more than 5° during follow-up made the incidence of postoperative malalignment higher (65.0%) compared to decrease less than 4° (25.9%) ($p < 0.01$).

Discussion

Only T1 slope had significant influence on the development of postoperative cervical malalignment among sagittal parameters. Considering that T1 slope is a landmark of total spinal alignment, these results may indicate the changes in each sagittal parameter influenced postoperative cervical alignment indirectly.

Conclusion

The development of postoperative cervical malalignment in CSM patients related strongly to T1 slope.