

Introduction

Cervical spondylotic myelopathy (CSM) is a common spinal pathology resulting from compression of the cervical spinal cord. Surgical decompression by laminoplasty is commonly used for multilevel stenosis. However, long term follow-up in those undergoing cervical laminoplasty in those patients in terms of cervical range of motion is not well understood. Furthermore, observing range of motion through photogrammetric analysis in such patients has not been performed before.

Methods

Patients who underwent a “French Door” type laminoplasty from 1995 to 2016 with postoperative photographs assessing for cervical rotation, extension, and flexion were included. CBVA was measured in all post-operative photographs and utilized to assess for flexion and extension. A line drawn from the nose to the occiput in overhead images was used to measure degree of rotation. Cervical radiographs were used to assess for cervical radiographic parameters. Mean values were compared to established normal cervical alignment values (Radcliff et al., 2011).

Results

44 patients (mean age 65.7 years, 50% female) were included in this study. Mean follow-up time was 37.9 months [6 weeks to 21 years]. Mean C1-2 was found to be -32.0° [±6.2] as compared to the established value of -29° [±7°]. Mean CL was found to be -3.7° [±13.9°], which is within 1 SD of the established -17° [±14°] but shows a loss of some lordosis over time. Mean T1S was found to be 33.2°, with mean TS-CL 29.6°. Cervical rotation towards patients’ left side was 47.6° and towards the right being 45.1°. Mean CBVA based on photographic images were -4.4° with mean cervical flexion being 41.8° and mean cervical extension being 40°.

Conclusions

Photogrammetric analysis may be considered a precise and valid method for the quantitative assessment of range of motion in all planes for the cervical spine. Range of motion is well preserved in patients who undergo cervical laminoplasty, even after many years postoperatively. A novel method for measurement of cervical range of motion is presented.

Learning Objectives

Cervical flexion, extension, and rotation were measured in post-operative photographs. Radiographic parameters (C1-2 lordosis (C1-2), C2-7 lordosis (CL), T1-slope (T1S), and TS-CL) were measured on all post-operative radiographs.

References

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