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Single level anterior cervical fusion. A new method to evaluate the real need of plate augmentation.

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Dear Editor,

in the article named "DO STAND ALONE CERVICAL INTERBODY SPACERS POSE ANY ADVANTAGE OVER PLATE AND SCREWS?" the author concluded the importance of the use of cervical plates in 2 or more level disc pathology. The reason is that the use of anterior plates would improve the cervical lordosis and the arm pain while reducing the risk of pseudoarthrosis and the incidence of graft related complication. In single level disc degeneration the author concluded that there is no evidence that the use of plates could be clinically significant(1).

We continued our research on cervical biomechanics studying cervical sagittal alignment parameters and their correlation with post-operative clinical outcome. The Cobb angle, C2-C7 Sagittal Vertical Axis (SVA) and T1 Slope (SL) are the main parameters to take into account in the event of a cervical degenerative pathology. The literature demonstrates that loss of cervical lordosis contributes to the development of myelopathy by different mechanisms: direct draping of the spinal cord against the vertebral bodies and the anterior pathology lead to increase of intramedullary cord pressure, reduction of spinal cord blood supply with consequent neuronal apoptosis and mielopathy (2).

In our study we calculated the following parameters by upright x-ray in 70 patients who underwent anterior cervical discectomy and fusion for single and multiple level: the C7 slope, T1 slope, cervical lordosis and the C2-C7 SVA (Fig.1); The CL/C7 slope ratio was then calculated. We analyzed the data in which we obtained by using Pearson correlation coefficient and Student t-test. The clinical post-operative outcomes were then evaluated after one year by using the Neck Disability Index (NDI) and Visual Analog Scale (VAS) score. In our findings, we discovered that the sagittal parameters are directly correlated with the clinical outcome. Specifically, a C2-C7 SVA value less than 25 mm is distinctively correlated with having a better surgical outcome. Additionally, if there is an increase in the C7 slope there needs to be a higher cervical lordosis in order to obtain a positive patient outcome. Patients with CL/C7 SL ratio of 0.7 or more showed to have a better clinical outcome compared to patients with lower values in terms of NDI and VAS score. We recommend that multiplying the ideal CL/C7 slope value (0.7) by the C7 slope can be an effective method used during the pre-operative

planning to calculate the ideal cervical lordosis value needed for each patient (3).

We think that this method could help us to decide whether to use or not the plate in the single level cervical degeneration. If following our method (Ideal lordosis = C7 SL x 0.7) the patient needs to increase the degrees of lordosis, it could be a good choice to use a plate to achieve much more lordosis as possible by reducing the risk of subsidence. If the patient has a good cervical alignment and doesn't need any additional lordosis we could decide upon a stand alone anterior cervical discectomy and fusion avoiding any additional risk of placing an anterior plate.

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3) Ajello M., Garbossa D. et all. **Is It Possible To Evaluate the Ideal Cervical Alignment for Each Patient Needing Surgery? An Easy Rule To Determine the Appropriate Cervical Lordosis in Preoperative Planning.** World Neurosurgery. 2017 Jan; vol 97: 471-478.

Fig 1. Lateral radiograph demonstrating the angle of C7 slope, the Cobb angle and the C2-C7 SVA