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Zero-Profile Implant for Three and Four Level ACDF. A Radiological and Clinical Analysis Focusing on Sagittal Alignment and Neurological Outcome

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Introduction

The purpose of this study is to analyze the efficacy and safety of zero-profile implants in multilevel ACDF, to evaluate the long-term results in a wide single Institution series, to compare the clinical and radiological postoperative outcomes to the data in the literature, to correlate the clinical status to the sagittal cervical profile.

Methods

We prospectively followed 24 patients (14 male and 10 female) with multilevel cervical spondylosis undergoing underwent ACDF with zero-profile implants. The mean clinical follow-up was 39 ± 17.4 months (range 24 – 72 months). Postoperative X-ray and CT evaluation of fusion and implant-associated complications was done. The alignment of the cervical spine was measured by Cobb angle between C2 and C7, given by the intersection of two straight lines tangent to the vertebral endplates, the bottom of C2 and the upper C7, on the standing lateral cervical x-ray.

Results

Radiographic fusion was achieved in 90% of implants, according to Pitzen criteria. Mean neck pain VAS score decreased from a 6.7 ± 2.9 to 1.6 ± 2.3 ($P<0.01$). Mean arm pain VAS score decreased from 5.9 ± 2.9 to 0.9 ± 1.4 ($P<0.01$). There were significant improvements ($P<0.01$) in SF36 and NDI following surgery. The cervical Cobb angle had a significant correction when compared with yhat before the operation.

Conclusions

A zero-profile integrated plate and spacer device for ACDF surgery appears to have biomechanical properties, stability and to produce clinical and radiological outcomes that are comparable to those for nonintegrated plate and spacer constructs. It allows decompression of neural structures and high fusion rates with low complication rates.

Learning Objectives

1. To understand the clinical applications of zero-profile implants for multilevel ACDF

2. To discuss pros and cons fo multilevel ACDF for cervical spondylotic myelopathy

3. To investigate the advantages of multilevel ACDF in restoration of cervical lordosis and understand the importance of sagittal alignment in determining clinical outcome

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