Cage-Screw and Anterior Plating Combination Reduces the Risk of Pseudarthrosis in Multi-level Anterior Cervical Discectomy and Fusion

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Background

Despite current advances in surgical technique and hardware, pseudarthrosis of the cervical spine following anterior fusion remains a significant complication, especially in patients with multilevel pathology.

Rates of pseudarthrosis range from 0-20% following a single-level ACDF and to as high as 50% with multi-segment fusions.

Circumferential fusion with supplementary posterior fixation decreases or eliminates the risk of pseudarthrosis after multilevel anterior cervical surgery. However, the use of double segmental fixation with a combination cage-screw system with anterior plating can possibly equally reduce the risk of pseudarthrosis following multi-level ACDF and eliminate the need for posterior fixation.

Methods

This is a retrospective, observational cohort study of all patients who underwent multi-level (≥2 levels) anterior cervical discectomy and fusion with a combination of cage-screw system with anterior plating system between January, 2011 and December, 2016.

A double segmental fusion (4 screws per level) was performed and autologous local bone graft was used to facilitate fusion.

Primary outcomes of arthrodesis were measured by evidence of radiographic fusion.

Results

• Between January, 2011 and December, 2016, 50 patient charts were evaluated.

• All patients underwent ACDF of 22 levels with double segmental fusion. The mean follow up period was 48 months. All patients had autologous local bone graft in conjunction with platelet rich plasma (PRP). No allograft was used

• The median rate of pseudarthrosis was found to be 4% and radiographic fusion was achieved in 96% of patients.

• There were no intraoperative complications reported. None of the patients required post-operative collars and no external fusion stimulator devices were used. No additional same level surgeries were required.

Conclusion

• Pseudarthrosis following anterior cervical discectomy and fusion is a common complication with increasing risk in multilevel fusions. The implementation of anterior cervical plating together with a cage-screw system increases segmental fixation and reduces the risk of pseudarthrosis after anterior cervical surgery when compared against historical controls, thus eliminating the need for posterior fixation.

References

