

Anterior Cervical Discectomy and Fusion: Comprehensive Comparison of Fusion and Complication Rates between Recombinant Human Bone Morphogenetic Protein-2 and Beta-Tricalcium Phosphate

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Introduction

Anterior cervical discectomy and fusion (ACDF) is one of the most common spinal procedures performed. A direct comparison of the fusion and complication rates between recombinant human bone morphogenetic protein-2 (rhBMP-2) and beta-tricalcium phosphate (beta-TCP) has not been reported.

Methods

A retrospective study of 85 consecutive patients who underwent anterior cervical discectomy and fusion with PEEK grafts over a 9-month period with either rhBMP-2 (n=31, 36.5%) or beta-TCP (n=53, 62.4%), or both (n=1, 1.1%) was performed. Patients underwent 1 (28.2%), 2 (41.2%), 3 (24.7%), and 4 (5.9%) level operations. The primary outcome measure is solid bone fusion, with secondary measures including clinical outcomes, complication occurrence, and incidence of adjacent segment disease necessitating further intervention. Fusion was assessed on lateral radiographs with median follow-up of 33 months.

Results

Hardware failures, pseudoarthrosis, or adjacent segment disease requiring further surgical intervention were not identified in either treatment group. There were no differences in postoperative complications or overall and ICU postoperative length of stay, between the rhBMP-2 and beta-TCP fusion treatment groups ($p>0.05$). 20 patients (23.5%) experienced postoperative dysphagia, with 17 requiring postoperative steroids and 13 requiring speech therapy consultation. There was no association between dysphagia and treatment group, number of levels fused, PEEK graft height, anterior plate length, body mass index, or Malanpati score. No surgical site infections were identified in either treatment group. A sensitivity analyses to control for the number of spinal fusion levels showed no differences in rates of fusion or complications between rhBMP-2 and beta-TCP.

Conclusions

In our cohort, there were no differences in fusion, clinical outcomes, or complications in patients undergoing single or multi-level ACDF with rhBMP-2 or beta-TCP. Given the high cost and reported increased potential side effects associated with rhBMP-2,

Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Compare the fusion and complication rates between rhBMP-2 and beta-TCP
- 2) Discuss the factors contributing to post-operative dysphagia
- 3) Describe the variables affecting pseudoarthrosis and adjacent segment disease

References