A Prospective Randomized Comparison of Coralline Hydroxyapatite with Autograft in Cervical Interbody Fusion

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INTRODUCTION: Tricortical iliac crest bone is the gold standard graft material for cervical interbody fusion. Various bone substitutes have been used for this procedure to avoid potential donor site morbidity. ProOsteon 200 is a coralline-derived hydroxyapatite product, the use of which remains unclear in cervical interbody fusion. The authors presented a prospective randomized trial with independent clinical and radiographic outcome review of patients receiving either hydroxyapatite or tricortical iliac crest graft for cervical interbody fusion. The objective of this study is to determine if coralline-derived hydroxyapatite is a suitable bone graft substitute in cervical interbody fusion.

METHODS: Twenty-nine patients undergoing anterior cervical fusion and plating were randomized to receive either ProOsteon 200 (HA Group) or iliac crest (IC Group) grafts. The SF-36 and Oswestry Disability Index were used to measure clinical outcome. Postoperative radiographs were analyzed for graft fragmentation, loss of height, angular alignment, and hardware failure to assess structural integrity of the graft material. Plain radiographs and CT scans were used to evaluate fusion.

RESULTS: Both the HA and IC groups demonstrated significant improvement in clinical outcome scores. There was no significant difference in clinical outcomes or fusion rates between the two groups. Graft fragmentation occurred in 89% of the hydroxyapatite grafts and 11% of the autografts (p=.001). Significant graft settling occurred in 50% of hydroxyapatite grafts vs. 11% of autografts (p=.009). One patient in the HA Group required revision surgery for graft failure.

CONCLUSIONS: ProOsteon 200 does not possess adequate structural integrity to resist axial loading and maintain disc height or segmental lordosis during cervical interbody fusion.