

Prospective Non-Randomized Comparison of Allograft with Bone Morphogenic Protein versus Iliac-Crest Autograft in Anterior Cervical Discectomy and Fusions

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Abstract

Background context

Anterior cervical discectomy and fusion (ACDF) using autogenous iliac bone graft may lead to donor-site morbidity. This has led some surgeons to use alternatives to iliac bone graft, but often the alternatives have greater rates of nonunion and delayed union. Bone morphogenic protein (BMP) studies have found high arthrodesis rates in lumbar fusions.

Purpose

The objective of this pilot study was to compare the success of BMP combined with bone allograft with iliac bone autograft in ACDF patients.

Study design/setting

The institutional review board approved a prospective but nonrandomized study of 66 consecutive patients who had primary one- to three-level ACDF with either iliac-crest bone autograft or BMP allograft (0.9 mg BMP per level) followed prospectively over a 2- to 3-year period.

Patient sample

Consecutive patients who had primary one- to three-level ACDF with either iliac-crest bone autograft (n=36) or BMP-allograft (n=30). Patients in both iliac bone graft and BMP-allograft groups had comparable preoperative pain and disability.

Outcome measures

Visual analog scale pain, pain drawing, Oswestry index, pain medication use, opinion of treatment success, and neurological recovery.

Results

Given the nonrandomized nature of the study, the study groups were not matched. Within this limitation, both groups of patients had similar improvement in all outcome scales (visual analog scale pain, pain drawing, Oswestry index, pain medication use, and opinion of treatment success) and neurological recovery over the 2- to 3-year follow-up period. Patients in the iliac bone graft group had two pseudarthroses and two complications of the iliac-crest donor site. In the BMP-allograft group, one patient had a pseudarthrosis, but 50% had neck swelling presenting as dysphagia, which was substantially more common than the 14% present in the iliac bone graft group. Patients in the BMP-allograft group had slightly shorter surgery time, but implant and hospitalization costs were higher.

Conclusions

ACDF performed with BMP (0.9 mg BMP per level) allograft is as effective as iliac bone graft in terms of patient outcomes and fusion rates. Safety concerns related to neck swelling and higher initial costs were associated with patients in the bone morphogenic protein group.