

Does the application of a Hemostatic Bone Putty consisting of Hydroxyapatite and β -Tricalcium Phosphate hinder bony fusion in Anterior Cervical Discectomy and Fusion?

Summary of background data:

Bone wax substitutes can be used to control bleeding bone. One of these substitutes is an FDA-approved resorbable hemostatic bone putty composed of Hydroxyapatite (HA) and β -Tricalcium Phosphate (TCP), biomaterials shown in preliminary studies to be effective bone graft substitutes.

Objectives:

We sought to evaluate the safety of using the HA/TCP bone putty as an adjunct in Anterior Cervical Discectomy and Fusion (ACDF).

Methods:

A retrospective chart review was completed of 145 patients undergoing one-to three-level primary ACDF by the senior author between 2013 and 2018. Two patient cohorts were assembled: patients receiving Bone Putty (BP+, 63%), and patients not receiving bone putty (BP-, 37%). Patients received autograft, allograft or both. After bone graft placement, a 1 mm thick layer of the HA/TCP bone putty was placed on either side of a packed cage construct. X-ray imaging was evaluated for evidence of early fusion (partial bone growth at the graft/end interfaces or through the interbody cage) at 4 months. Other outcomes investigated include Clinical Outcome (measured by Odom's Criteria (OC)) Complication Incidence, Operative (OP) Time, Blood Loss (BL) and Hospital Length of Stay (LOS).

Results:

Three patients developed post-operative complications in each patient group. The BP+ Group displayed an early fusion rate of 67% at 4 months compared to 33% for the BP- group ($p=0.021$). Regression analyses indicated that the BP+ group had better clinical outcomes over time ($p=0.001$). At 12 months this group had a mean OC score of 2.2/4; the BP- group had a mean score of 2.8/4. OP Time (BP+: 70.5 mins, BP-: 76 mins), LOS (BP+: 17 hours, BP-: 18 hours) and BL (BP+: 68 ml, BP-: 70 ml) were comparable between both patient groups.

Discussion/Conclusion:

HA/TCP Bone Putty appears safe for use in ACDF with no obstruction of fusion or clinical success.