

Bone Reconstitution With Synthetic Bone Graft Material for Osseous Defects in Revision Total Ankle Arthroplasty

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Introduction/Purpose: Various treatments have been suggested for the treatment of periarticular cysts in revision total ankle arthroplasty including autograft and allograft bone grafting, polymethylmethacrylate cement, and revision to ankle or tibiotalocalcaneal arthrodesis. This study investigated the rate of osseous reconstitution following treatment with a unique calcium phosphate-calcium sulfate blend.

Methods: A retrospective review of all revision total ankle arthroplasty procedures over a 3 year period was performed. 37 patients were identified that had utilized the calcium phosphate-calcium sulfate blend for the treatment of osseous defects. Data on graft location, volume, infection rate, bone reconstitution rate, and further revision procedures were collected. Plain radiographs were used to determine osseous reconstitution, qualified as bony trabeculae present with no lytic area remaining. Patient's average age was 66 years old, revision performed an average of 9.5 years after primary arthroplasty, with an average of 503 (range 99-1333) days of follow up.

Results: Grafting of 23 tibial, 23 talar, 7 fibular, and 5 calcaneal bone defects were undertaken. All patients had Agility implants at time of primary arthroplasty. 16 patients had retention of Agility components, with 21 being revised to Inbone 2 implants. An average of 8.25ml of material was used. Complete bone reconstitution was noted in 24 patients (65%). Incomplete or no bony healing was noted in 9 talus, 2 tibias, and 2 fibulas. Further revision was performed or offered to 7 patients for continued symptoms(19%). No seromas or excessive wound drainage was noted.

Conclusion: Grafting of osseous defects for total ankle arthroplasty with a fully synthetic calcium sulfate and calcium phosphate mixture is an effective technique. Caution should be used in its use for patients with talar subsidence, as these have higher rates of failure likely due to its diminished blood supply and smaller surrounding structural support. It should not be depended to provide significant long-term structural support.

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