Resection Arthroplasty for Limb Salvage in Severe Unreconstructable Charcot Joints

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Category: Diabetes

Keywords: Charcot, Limb Salvage, Resection Arthroplasty

Introduction/Purpose: When non-operative treatment of very severe Charcot neuroarthropathy (CN) of the ankle and hindfoot fails, surgical options for limb salvage are limited. Some patients have insufficient bone stock or medical and psychosocial factors that make arthrodesis untenable. Resection arthroplasty can create a braceable, plantigrade ankle and foot, preserving the limb and maintaining ambulatory independence.

This study evaluated the results of resection arthroplasty and bracing as an alternative technique of limb salvage in the subset of patients who would otherwise require amputation for unreconstructable Charcot deformity.

Methods: The medical records and radiographs of 16 patients who underwent resection arthroplasty for unreconstructable Charcot deformity from 2000-2014 were retrospectively reviewed. All had diabetic peripheral neuropathy. The average follow-up was 46.75 months (range 9-111 months).

Data included demographics, medical history, ambulatory status, and soft tissue lesions. Radiographs were categorized according to the Brodsky Charcot classification.

Pre-operatively, 2 patients were community ambulators without assistive device. Four patients were wheelchair bound. Ten patients (62.5%) had limited ambulatory independence, as either home ambulators or reliant on assistive devices, such as crutches and walkers.

At the time of surgery, 87% had presence of persistent and recalcitrant ulceration as a result of their deformity. Fifteen patients (93%) had Brodsky Type 2 (Hindfoot) or Type 3 (ankle) Charcot joints.

Primary outcomes assessed were limb survivorship and ambulatory status at last follow-up. Secondary outcomes included wound complications, infection, and need for subsequent surgical procedures following index procedure.
Results: Kaplan-Meier survivorship probability estimate for limb salvage at 5 years following resection arthroplasty was 93% (95% CI 66%-99%).

A total of 4 resection arthroplasties ultimately failed, requiring BKA. Three out of 4 amputations occurred after 5 years of successful function. Of the 12 patients who retained their limb at final follow-up, all had braceable deformity without evidence of skin breakdown or infection at the time of final follow-up. Eleven of the 12 were independent community ambulators with bivalved AFO (BAFO).

With regard to overall changes in ambulatory status following resection arthroplasty, all patients who were independent community ambulators pre-operatively maintained their ambulatory independence post-operatively with use of BAFO. For patients who were either non-ambulatory or dependent ambulators pre-operatively, 10/14 (71%) achieved ambulatory independence.

Conclusion: Resection arthroplasty with long-term post-operative bracing is an effective alternative technique for limb salvage and preservation of ambulatory independence in the subset of CN patients who would otherwise likely require amputation for unreconstructable deformity.