Comparative Analysis of Charcot Ankle Stabilization using an Intramedullary Rod With or Without Application of Circular External Fixation – Utilization of the RAIN Database

Presenting: J. George DeVries, DPM (Westerville, Ohio)
Gregory C. Berlet, MD; Christopher Hyer, DPM

Introduction: Brodsky Type IIIA Charcot destruction of the ankle is a devastating problem for patients and physicians. Both operative and non-operative management of this pathology is fraught with controversy and complications. The authors have surgically stabilized this deformity with the use of an intramedullary arthrodesis nail, and explore the usefulness of adjunctive application of a circular external fixator.

Method: 52 patients with Type IIIA Charcot neuroarthropathy were treated with retrograde intramedullary nail with and without circular external fixation. A comprehensive chart and radiographic review was pulled from the Retrograde Arthrodesis Intramedullary Nail (RAIN) database. Of these, 45 patients were treated with a nail alone (NA group), and 7 were treated with a nail and circular external fixation augmentation (XA group). The primary end point was major amputation or braceable limb, with a variety of variables evaluated for influence.

Result: The average age in the NA groups was 59.4 years, while in the XA group is was 51.6 years, p>0.05. The average Body Mass Index was 34.1 in the NA group, and 35.5 in the XA group, p>0.05. Chronic steroid use was found in 3 patients (6.7%) in the NA group, and 4 (57.1%) in the XA group, p>0.05. Orthobiologic augmentation was utilized in 28 patients (72.7%) in the NA group, and 5 (71.4%) in the XA group, p>0.05. Extended tarsal fusions were required in 6 patients (13.3%) in the NA group, and 3 (42.9%) in the XA group, p>0.05. Hardware removal, incision and drainage procedures, and intravenous antibiotics were required in 19 (42.2%), 22 (48.9%), and 25 (55.6%) patients, respectively, in the NA group, compared to 3 (42.9%), 3 (42.9%), and 4 (57.1%) in the XA group, p>0.05 for all comparisons. The rate of major amputation in the NA group was 10/45 (22.2%) and in the XA group was 2/7 (28.6%), p>0.05, with an overall salvage rate of 40/52 limbs (75.6%).

Conclusion: The addition of circular external fixation does not affect the overall salvage or complication rate when dealing with Type IIIA Charcot stabilization with the use of a retrograde intramedullary nail. The authors feel that the added stability offered by external fixation may benefit patients whom are at high risk for complications or require extended arthrodesis, but this was unable to be demonstrated statistically in this study. Patients with this difficult pathology can be successfully salvaged, but there is a high risk of complications.

Level of Evidence: III