Pedal osteolysis after acute neuropathic (Charcot) arthropathy with persistent local and systemic markers of inflammation.

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BACKGROUND
The acute stage of neuropathic Charcot arthropathy (NCA) is characterized by gradual onset of a red, hot & swollen foot with a dulled sensation to pain and a loss of function impairing mobility and walking. This inflammatory stage may be associated with a profound loss of bone mineral density (BMD) in the tarsal and metatarsal bones. The goal of orthopedic management during the acute stage of NCA is immobilization & off-loading the foot until inflammation has subsided and the foot is stable for weight bearing. The magnitude of pedal bone loss (osteolysis) resulting from immobilization & following resolution of the acute stage of NCA is not known and has not previously been reported.

OBJECTIVE
The purpose of this study is to determine the magnitude of bone loss in the tarsal and metatarsal bones & the local and systemic markers of inflammation in participants with diabetes mellitus (DM), peripheral neuropathy (PN) and neuropathic Charcot arthropathy (NCA) one year after acute-onset.

METHODS
All participants completed tests at baseline and 1 year:
- Quantitative computed tomography (QCT) of both feet (Siemens Somatom Definition CT Scanner)
- Foot skin temperatures (Exergen Dermatemp DT1001-LN)
- Blood drawn for inflammation markers: C-reactive protein (CRP) & erythrocyte sedimentation rate (ESR)

RESULTS
Data Analysis: Tarsal & metatarsal BMD, skin temperature differences between feet and serum markers of CRP & ESR were compared using a Group X Time repeated measures ANOVA.

RESULTS, cont.

CONCLUSIONS
Local and systemic markers of inflammation persist for a year in some participants after treatment resulting in a net loss of BMD. The persistent inflammation may be the contributing cause for pedal bone osteolysis resulting in foot deformities characteristic of the chronic Charcot foot.

CLINICAL RELEVANCE
Patients with NCA may require: 1) longer immobilization time & offloading to reduce inflammation; 2) a slower return to weight bearing activities; 3) therapeutic agents to limit pedal osteolysis following acute NCA.