Clinical Success of Limb Salvage in Patients with Charcot Neuroarthropathy

Presenting:
Roman Natoli, MD, PhD
Maywood, Illinois, USA

Additional Authors:
Adam P. Schiff, MD; Dennis I. English, BS; Manuel J. Pellegrini, MD; Michael S. Pinzur, MD

Summary:
Charcot neuropathic patients present a clinically challenging problem. In our cohort, we demonstrate improved clinical outcomes by limb salvage operations.

Introduction:
Charcot neuropathic foot and ankle joints remain a challenging clinical problem. The goals of limb salvage are to obtain a brace-able and clinically plantigrade foot that allows for ambulation. This can be accomplished by the use of osteotomy for the purpose of re-alignment and fusion. At our institution, arthrodesis is attempted using thin-wire external fixators. We hypothesized that although radiographic fusion is difficult in this challenging patient population, we are able to achieve an acceptable clinical result and minimize the rate of amputation.

Methods:
A single surgeon’s cohort of surgically treated Charcot neuropathic midfoot and ankle joints from 2005-2012 was retrospectively evaluated. Seventy-one patients were identified, of which 19 patients had a diagnosis of Charcot ankle and 52 with Charcot neuroarthropathy of the midfoot. Medical records were evaluated for the presence of fusion, clinical stability, patient risk factors, and complications of treatment. We defined an excellent clinical result as one in which patients could ambulate independently in commercially available shoes. A good result was defined as the ability to ambulate independently in custom-made orthotics. A poor result is one in which the patient could not independently ambulate, had a symptomatic non-union, or required a below knee amputation.

Results:
Seventy-two patients with Charcot neuroarthropathy underwent limb salvage arthrodesis operations using thin wire external fixators. The mean age of these patients was 58 years old (range: 43-83 years). There were 31 females and 40 males. The mean body mass index was 38.2kg/m2 ± 6.9. The mean serum 25-OH vitamin D level was 22.1ng/ml ± 10.6. Fifty-five patients (77.5%) of patients had serum 25-OH vitamin D levels in the insufficient range (<30ng/ml), while thirty-two patients (45.1%) meet the criteria for vitamin D deficiency (<20ng/ml). Thirty-one patients (43.7%) achieved successful excellent results by ambulating independently in commercially available shoes. Twenty-one patients (29.6%) had good results by achieving clinical stability and ambulating independently in custom-made orthotics. Nineteen (26.8%) patients had poor results: three patients died prior to expected clinical union and one patient underwent below-knee amputation for recurrent infection. Pre-operative Vitamin D levels or BMI did not correlate...
with clinical or radiographic success.

**Conclusion:**
Patients with Charcot neuroarthropathy represent a challenging clinical dilemma. The ability to achieve independent ambulation and the long-term survival after a trans-tibial amputation is dismal in this population. In our cohort, we demonstrate an improved outcome (73.3% good-excellent outcomes) in clinical stability and function after attempted limb salvage.