TIBIAL FRACTURE ASSOCIATED WITH HALF-PIN USE IN CIRCULAR RING EXTERNAL FIXATION AMONG PATIENTS WITH CHARCOT

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DISCLOSURE

• The authors have no conflicts to report relevant to the research presented here
INTRODUCTION

• Circular ring fixation is commonly used to treat complex lower leg problems including infected nonunions, severe deformities, and unstable Charcot arthropathy.

• Modern circular rings are typically secured to the bone with a combination of tensioned thin-wires and large half-pins (5-7 mm diameter).
INTRODUCTION

- Multiple complications have been reported with the use of circular ring fixators.

- Anecdotally we noted a relatively high rate of tibia fractures through half-pin sites, particularly in neuropathic patients being treated for Charcot arthropathy.
HYPOTHESIS

- We hypothesized that neuropathic patients have a higher rate of tibia fractures through half-pin sites compared to non-neuropathic patients
METHODS

- Retrospective chart and radiographic review of all patients who underwent circular ring fixation (below the knee) between May 2004 and November 2010
- 135 patients were identified: 48 patients WITH Charcot (study group) and 87 non-neuropathic patients (control)
- Data collected included demographics, indications, duration of frame, and complications
- All the patients in the study group (Charcot) were treated with a static fixator construct for a neuropathic deformity
RESULTS

- Age: Charcot group was significantly older than the control group (56.2 vs 46.5 yrs)
- Smoking: Significantly lower rate of tobacco abuse in Charcot group (2% vs 29%)
- BMI: No difference between groups
- Frame duration: Statistically shorter in Charcot group (92 vs 146 days)
- Complications: Total number, including minor and major was equal between the two groups
COMPLICATIONS

• There were a total of 8 (6%) tibia fractures through previous pins sites

• There was a statistically higher percentage in the Charcot group (6/48, 12.5%) versus the control group (2/87, 2.3%)

• All 6 of the tibia fractures in the Charcot group occurred through half-pin sites that had been previously infected

• In the Charcot group, 3 fractures occurred with frame on, and 3 after frame had been removed

• All 6 fractures in the study group occurred with relatively minor trauma
CONCLUSIONS

• A higher rate of tibia fractures associated with half-pins in neuropathic patients has not been previously reported.

• We caution against the use of half-pins with circular ring fixation in neuropathic patients in the lower extremity.
REFERENCES


• Wukich DK, Belczyk RJ, Burns PR, Frykberg RG. Complications encountered with circular ring fixation in persons with diabetes mellitus. Foot Ankle Int. 2008;29:994-1000.