Primary Results of Bone Biopsies in Outpatients with Neuropathic Ulcers: Comparison with Wound Swabs and Superficial Tissue Samples
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Introduction/Purpose: Patients with Charcot foot disease often develop ulcers that probe to bone due to progressive deformity and loss of protective sensation. Infection of the ulcers and the underlying bone is common. In order to diagnose and treat osteomyelitis, especially in cases where reconstruction is planned, the pathogen must be isolated. The need for bone debridement and the duration of antibiotic treatment depends on the presence of bone infection. Percutaneous bone biopsies through intact skin is the gold standard for acquisition of samples for cultures. The presence of neuropathy negates the need for anaesthesia and renders biopsies possible in the outpatient setting. In our study we compare the results of bone biopsies with wound swabs and document the safety of the technique in clinic.

Methods: Thirty five patients were included in the study. Inclusion criteria were the presence of neuropathy and foot ulcers with exposed bone (Grade 3 University of Texas wound classification). Samples were obtained by three different doctors with aseptic technique through intact skin and sent for cultures. The area of the bone where the sample was taken from was defined by the location of the ulcer, the available imaging and anatomical landmarks. Complications such as bleeding and entry point infection and delayed healing were documented. Superficial ulcer swabs were also obtained for comparison.

Results: In 37 patients 2 procedures were abandoned due to pain; otherwise no complications during or after the biopsy were recorded and the procedure duration was 4 minutes at most. There was bacterial growth in 40% of bone biopsy samples, compared to 65.7% of superficial swabs. Cultures were polymicrobial in 35.7% of positive biopsies and 82.6% of positive ulcer swabs. Concordance between bone biopsy and swab results was seen in 16/35 (45.7%) of samples. In 7 patients both tests were negative and in 9 both positive. 7/9 of samples that were positive with both methods grew the same organism.

Conclusion: Our study showed that there is poor concordance of the results of the two tests. Wound swabs have high rates of polymicrobial cultures; in comparison bone biopsies are more reliable in confirming a specific microbial organism and dictating the need for and type of antibiotic. Targeted antibiotics can thus be safely used, potentially reducing the complications and the cost of broad-spectrum antibiotic treatment. The technique of needle bone biopsy is easy, safe and reproducible, and pain is not a limiting factor for in outpatients with neuropathy.