Unsuspected Osteomyelitis is Frequent in Persistent Diabetic Foot Ulcers and Better Diagnosed by MRI than by $^{18}$F-FDG or $^{99m}$Tc-MOAB

Reference:

Scientific Literature Reviews

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Podiatric Relevance:
In patients with diabetes mellitus, the estimated lifetime risk of developing a foot ulcer is 15-25% and in patients with foot ulcers, about 20% will develop osteomyelitis (OM). Early detection of osteomyelitis may decrease the risk of lower limb amputation, an unfortunate common end treatment for chronic foot ulcers. According to some studies, clinical signs of osteomyelitis are absent in 44 – 68% of diabetic foot ulcer cases. The objective of this study was to investigate the prevalence of clinically unsuspected osteomyelitis in chronic diabetic foot ulcers (DFUs) and compare the diagnostic value of MRI with 18F-FDG PET and 99mTc-MOAB imaging methods.

Methods:
Twenty (20) patients with diabetes and foot ulcers (mean duration of 21.9 weeks) were recruited. Inclusion criteria consisted of: diabetes mellitus diagnosed according to A.D.A. criteria; non-healing chronic foot ulcer for ≥ 8 weeks; absence of antibiotic pretreatment and of clinical signs or symptoms of local or systemic infection. Exclusion criteria consisted of: presence of clinical signs of local infection & positive probe-to-bone (PTB) test and antibiotic therapy in the month preceding the study. All patients underwent MRI, 18F-FDG PET and 99mTc-MOAB foot imaging. If at least one imaging method was suspicious for osteomyelitis, a bone biopsy was performed. Radiologists or nuclear medicine physicians initially interpreted all images. At the conclusion of the study, both radiologists and nuclear medicine physicians (blinded to the data and the primary assessment) retrospectively evaluated all images in consensus.

Results:
Of the 20 patients with chronic foot ulcers and clinically unsuspected osteomyelitis, 7 showed an osteomyelitis-positive imaging modality on one or more diagnostic tests. Osteomyelitis was confirmed in all 7 patients by bone biopsy. The respective sensitivities, specificities, and accuracies in the diagnosis of osteomyelitis were: 29%, 92% and 70% for PET data; 29%, 85% and 65% for 99mTc-MOAB data; and 86%, 92% and 90% for MRI data.

Conclusions:
When evaluating DFUs, most clinicians do not suspect osteomyelitis in the absence of clinical signs of infection. In this study, 35% of patients with chronic foot ulcerations were found to have osteomyelitis, despite having no clinical indicators. A lower, less-traditional threshold for ordering imaging studies diagnostically superior to conventional radiography (i.e. MRI) may help in determining proper treatment with better outcomes, especially in cases of chronic wounds.