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Needle Puncture and Transcutaneous Bone Biopsy Cultures are Inconsistent in Patients with Diabetes and Suspected Osteomyelitis of the Foot.

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BACKGROUND: Needle puncture has been suggested as a method for identifying bacteria in the bones in patients with diabetes with osteomyelitis of the foot. However, no studies have compared needle puncture with concomitant transcutaneous bone biopsy, which is the current standard recommended in international guidelines.

METHODS: We conducted a prospective study in 2 French diabetes foot clinics. Transcutaneous bone biopsy specimens, needle puncture specimens, and swab samples were collected on the same day for each patient.

RESULTS: Overall, 31 patients were included in the study from July 2006 through February 2008. Twenty-one bone biopsy specimens (67.7%), 18 needle puncture specimens (58%), and 30 swab samples (96.7%) had positive culture results. *Staphylococcus aureus* was the most common type of bacteria that grew from bone samples, followed by *Proteus mirabilis* and *Morganella morganii*. The mean number of bacteria types per positive sample were 1.35, 1.32, and 2.51 for bone biopsy specimens, needle puncture specimens, and swab samples, respectively. Among the 20 patients with positive bone biopsy specimens (69%), 13 had positive needle puncture samples. Overall, the correlation between microbiological results was 23.9%, with *S. aureus* showing the strongest correlation (46.7%). Results of cultures of bone biopsy and needle puncture specimens were identical for 10 (32.3%) of 31 patients. Bone bacteria were isolated from the needle punctures in 7 (33.3%) of the 21 patients who had positive bone biopsy specimen culture results. If the results of cultures of needle puncture specimens alone had been considered, 5 patients (16.1%) would have received unnecessary treatment, and 8 patients (38.1%) who had positive bone culture results would not have been treated at all.

CONCLUSIONS: Our results suggest that needle punctures, compared with transcutaneous bone biopsies, do not identify bone bacteria reliably in patients with diabetes who have low-grade infection of the foot and suspected osteomyelitis.

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