

## Toe ulcers and early diagnosis of osteomyelitis in diabetic patients

Maria Gala Santini Araujo, MD, Pablo Sotelano, MD, Nelly Carrasco, MD, Ana Parise, MD, Daniel Villena, MD

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**Introduction/Purpose:** Neuropathy and Peripheral arterial disease are the main causes of diabetic foot ulcers. Toes are the most frequent location. Osteomyelitis diagnosis of foot ulcers is still controversial, mainly in ulcers without bone exposure. Although MRI has 90% sensitivity and 85% specificity for osteomyelitis diagnosis, it is not usually used for early detection of bone changes, due to lack of availability and high cost. Bone biopsy puncture is considered the gold standard methodology together with microbiological and histological examinations, but it is not always available in all practices. The purpose of this study was to describe the diagnosis in forefoot ulcers found in diabetic patients using MRI and bone biopsy puncture.

**Methods:** This is a retrospective study, a case series. Clinical records of patients with injuries limited to toes between January 2013 and December 2015 were analyzed. The inclusion criteria were: patients with Diabetes Mellitus (DM) diagnosis and with a grade I or 2 digital ulcer according to Wagner's classification for at least 3 weeks, with visible bone edema in the magnetic resonance (MRI) and those with a bone biopsy performed, and with a minimum follow-up of a year. Patients with diabetic foot ulcers were evaluated by an interdisciplinary team. Laboratory standards were evaluated preoperative and during antibiotic therapy. The surgical bone biopsy was performed by a foot and ankle surgeon with experience in Diabetic foot pathologies. Microbiological and histological study was analyzed. We also recorded the demographic data and identified the patients who had received previous empiric antibiotic therapy. Statistical analysis was performed.

**Results:** Thirty patients out of 93 patients fulfilled inclusion criteria between January 2013 and December 2015. Eleven patients had grade I ulcers and 19 grade 2.

Twenty-two patients (73.3%) got bone biopsies with positive cultures and 14 (63.3%) had a positive pathological anatomy.

Eight patients got negative cultures and pathology.

Six patients that did not receive empiric antibiotic therapy and 19 patients out of 24 who had received empiric antibiotics had positive cultures.

Mean healing time for patients who did not have antibiotics was 4 weeks (3-12) and for the group who received empiric antibiotics was 6 weeks (4-10).

Only 4 patients out of 19 patients with Wagner II ulcers had the toe amputated.

**Conclusion:** A precise diagnosis of the germ was obtained in 73.3% of the patients and a specific antibiotic treatment was completed. Although empiric antibiotic therapy 19 out of 24 patients had positive bone cultures and healing time was longer. Amputation index was 13%, all of them were grade 2 ulcers. There were no major amputations.

We consider that in these kind of ulcers that had more than 3 weeks without healing and had no radiographic changes, MRI can show bone edema. Surgical bone biopsy should be done to begin specific antibiotic therapy and improve healing time.



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