



ULCER PREVALENCE AFTER SURGICAL APPROACH OF THE METATARSAL HEAD OSTEOMYELITIS IN DIABETIC FOOT

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Introduction

Metatarsal head is a common location of neuropathic diabetic foot ulcer and consequently osteomyelitis. Surgical osteotomy of the metatarsal head have been described like good alternative for its treatment⁽¹⁻³⁾. (Image 1-3)

However surgical approach could produce alteration of foot biomechanics and may result in new high-pressure areas and predispose patients to subsequent reulceration⁽¹⁾.

Reulceration rates after this kind of surgery have not been previously described.



Image 1



Image 2



Image 3

Objectives

1. To analyse ulceration rate in patients who have been treated with surgical removal of metatarsal head to due pressure transfer syndrome.
2. To demonstrate the importance of customized orthopaedic treatment.



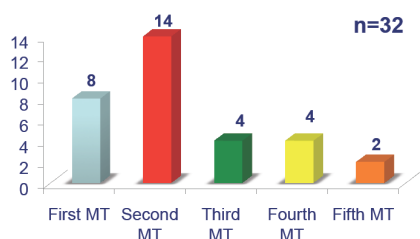
Image 4



Image 5

Results

New lesion rate after 6 months due to pressure transfer syndrome it was 47.1% (32 lesions). Univariate analysis was done showing risk factors of new lesions (Table 2). Ulcerated patients have been received customized orthopaedic treatment of their feet with insole and therapeutic shoes. After 12 months new lesions rate was 8.8% (6 patients). High decreased of the ulceration rate have been demonstrated after customized treatment.



Graphic 2. Re-ulceration location distribution after surgery

Discussion

Ulceration risk after surgical metatarsal head osteotomy was very high due to pressure transfer syndrome to the adjacent metatarsal head. Planning of surgery relationship with accurate decision of osteotomy location and amount of bone resection should be taken into consideration when choosing surgical option. Biomechanics alterations were produced after surgical, therefore customized orthopaedic treatment is very important in the management of this patient.

References

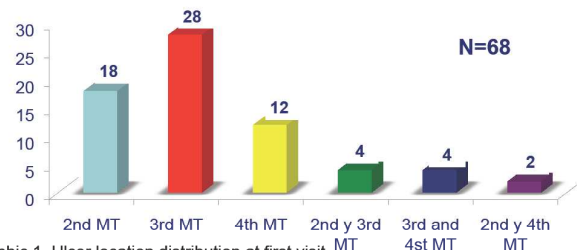
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Material and Methods

Prospective longitudinal settings during 6 and 12 months after surgical, which it was included patients who have been received surgical osteotomy of the metatarsal head diagnosed from osteomyelitis during 2007 October and 2009 March. Total removal of the metatarsal head was done (Image 4-5). 68 patients were included. Patients were treated with standard shoes and insole during the first 6 months. New ulcer development has been registered. Patients with new lesions were treated with customized shoes and insole. A new register of the new lesions has been done at 12 months.

Gender (male) (n%)	50 / 73.5%
Age (median/IQR)	59.3 / 12 years
Diabetes type 2 (n%)	58 / 85.3%
Suffering time from ulcers (median/IQR)	20 / 35.5 weeks
Previous ulcer (n%)	50 / 73.5%
Previous amputation (n%)	44 / 64.7%
Absent pulses (n%)	4 / 5.9%
Ankle/Brachial Index (median/IQR)	1.06 / 0.44
TcPO ₂ (median/IQR)	34 / 15.25 mmHg.
Probe to bone test positive (n%)	56 / 82.4%
XR destruction signs (n%)	56 / 82.4%
Clinical infections signs (n%)	50 / 73.5%
Ulcer culture positive (n%)	62 / 91.2%

Table 1. Antecedents, vascular status and clinical characteristics.



Graphic 1. Ulcer location distribution at first visit.

Variables	Odds Ratio (CI 95%)	P value
Retinopathy	3.30 (1.09-9.96)	0.030
Nephropathy	1.18 (1.03-1.36)	0.027
Hypercholesterolemia	3.08 (1.11-8.52)	0.027
Neuroischemic ulcer	3.30 (1.09-9.96)	0.030
Previous ulcer	9.45 (1.95-45.71)	0.020

Table 2. Risk factors in new ulcers. Univariate analysis



INTEROBSERVER REPRODUCIBILITY OF PROBING TO BONE IN THE DIABETIC FOOT OSTEOMYELITIS DIAGNOSIS

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Introduction

Initial diagnosis of osteomyelitis in diabetic foot is suspected in the presence of an ulcer evolution after six weeks with adequate local and unload treatment locally, and when the bone is probe through the ulcer (1).

The technique of probing to bone was defined and validated by Grayson et al in 1995 (2), and later in 2006 by Lavery (3). But despite demonstrated validation, one of the limitations of previous studies and one of the most important properties that should require a diagnosis test is its reproducibility.



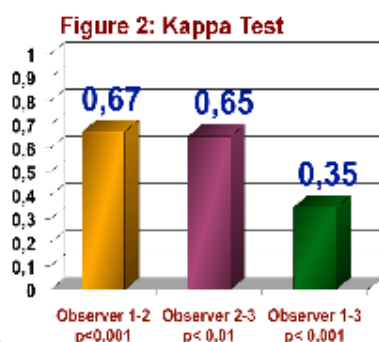
Objectives

1. To assess interobserver reproducibility of probing to bone test.
2. To establish the differences between observers in the diabetic foot specialist, in training and without experience.
3. To determine if this test as a diagnostic method is transferable to any speciality of health.



Results

Kappa Test of probing to bone in the different observers are showing in the figure 2. It is noted that interobserver variability exists in the test result based on clinical experience, statistically significant ($p < 0.001$). In Table 2x2 can be observed the probing to bone results of different observers.



Discussion

Training and professional ability attend patients with diabetic foot can influence the clinical diagnosis of osteomyelitis, we faced a test operator-dependent. It is therefore important to establish training plans so that there is not a discrimination and delay in the diagnosis of the most common infection of the diabetic foot, in addition to the complications involved, significantly increases the cost of treating these patients posed.

References

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Material and Methods

Longitudinal and prospective study, which include 36 patients with diabetic foot ulcer and osteomyelitis suspect, 25 (69,4%) male and 11 (30,6%) female, average age of $65,61 \pm 12,15$ years. The time since diagnosis of diabetes was $17,80 \pm 17,2$ years, 2,8% (n=1) of patients suffered Diabetes mellitus type 1 and 97,2% (n=35) type 2, Hb1Ac average of 6,6 mg/dl. The ulcer type was neurophatic in 61,1% (n=22), 27,8% (n=10) neuroischaemic, and 11,1% (n=4) ischaemic (Figure 1), with average time evolution ulcer of $26,94 \pm 85,68$ weeks. 47,2% (n=17) presented sinus tract, 38,9% (n=14) infection, and in 47,2% (n=17) radiology osteomyelitis signs. The most common localization of ulceration were central metatarsus in 30,6% (n=11) and central toes in same proportion. Probing to bone test was perform in all patients by three different professionals: Professional very experienced in managing diabetic foot several years (Observer 1). Moderately experienced professional with more than 6 months but less that one year of experience (Observer 2), and novice professional in diabetic foot managing (Observer 3), individually and without knowing the outcome of previous clinical Data were collected confidentially by a 4th researched. Kappa test was performed to calculated interobserver reproducibility.

Figure 1: Ulcer Type

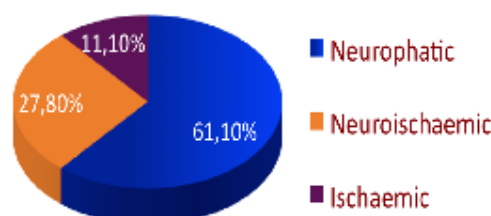


Table 1: Table 2 x 2

		Observer 1		
		Negative	Positive	Total
Observer 3	Negative	6	9	15
	Positive	2	19	21
	Total	8	28	36
Observer 2	Negative	8	5	13
	Positive	0	23	23
	Total	8	28	36