

Pulsed electromagnetic fields' effects on swelling and pain after implant surgery: a double-blind, randomised study

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Purpose

The aim of this split-mouth, double-blind, randomised study is to evaluate if pulsed electromagnetic fields treatment can improve swelling and pain management after a full-arch immediate loading implant surgery.

Materials and methods

11 patients were selected for the study. Each patient received four implants in the upper or lower jaw using distal tilted implants and underwent a full-arch immediate loading rehabilitation (Fig. 1.; Fig. 2.). After surgery, two pulsed electromagnetic field (PEMF) devices were applied on the right and the left cheek of each patient (Fig. 3.). Randomly, one PEMF device was switched on (test side), applying the other one as a placebo (control side). 48 hours after surgery, clinicians estimated the postoperative swelling through photographic documentation, comparing the condition prior and after surgery, while pain was assessed using a verbal rating scale (Fig. 4.; Fig. 5.).

Patients' degree of comfort in relation to PEMF devices was analysed by questionnaires using a numerical rating scale.

Results

No significant differences were observed between the test side and the control one regarding swelling and pain ($p > 0.05$) (Fig. 5.).

Most of patients did not present swelling or pain 48 hours after surgery, without distinction between whether the PEMF device was activated and not.

Variable outcomes emerged from the comfort evaluation.

Conclusions

Within the limits of this study, PEMF treatment does not reduce postoperative swelling and pain after immediate loading implant surgery.

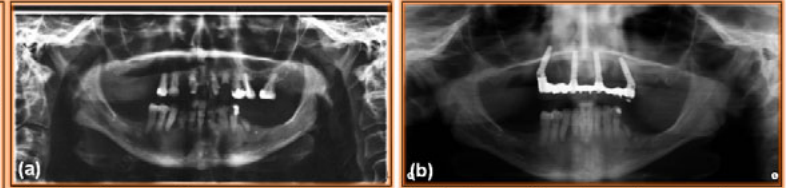


Fig. 1: a. Preoperative orthopantomography; b. Postoperative orthopantomography.

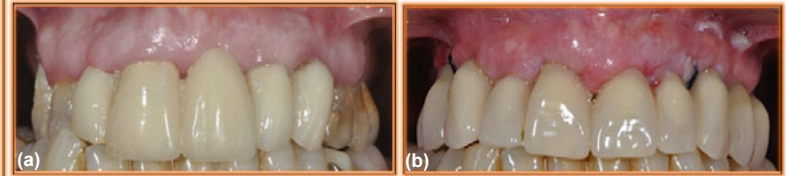


Fig. 2: a. Upper jaw prior implant surgery; b. Upper jaw 48h after implant surgery.

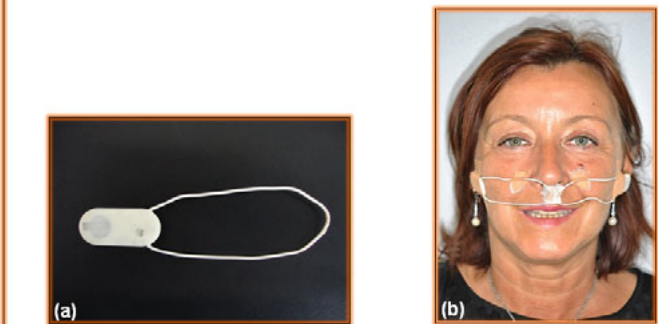


Fig. 3: a. PEMF device; b. PEMF devices applied after implant surgery.

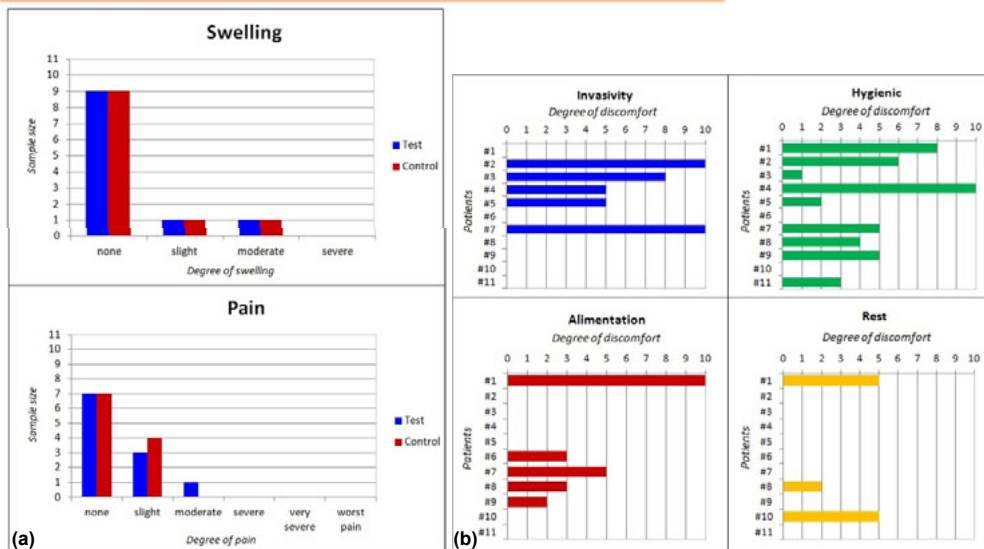


Fig. 5: a. Swelling and pain evaluation;

b. Comfort evaluation.



Fig. 4: a. Patient before implant surgery; b. Patient 48h after implant surgery.

Tab. 1. Characteristics of selected patients.

Patients	Gender	Age	Systemic disease and related therapy	Treated jaw	Residual teeth		Bone quality	
					right	left	right	left
#1	female	67	negative	upper	0	0	D4	D4
#2	male	62	Atrial fibrillation, Warfarin 5mg/die per os	upper	0	0	D4	D4
#3	female	59	negative	upper	3	3	D3	D4
#4	female	62	negative	upper	3	3	D2	D2
#5	female	56	negative	upper	4	5	D4	D4
#6	female	72	negative	upper	1	2	D4	D4
#7	female	71	negative	lower	0	0	D3	D3
#8	male	75	negative	upper	0	0	D4	D4
#9	male	65	negative	upper	0	0	D3	D3
#10	female	60	negative	lower	4	3	D2	D2
#11	female	51	negative	upper	3	5	D3	D3

References

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