MECTRON PIEZOSURGERY®
IMPLANT SITE PREPARATION – ONLY WITH THE ORIGINAL!

ONLY MECTRON IS PIEZOSURGERY®

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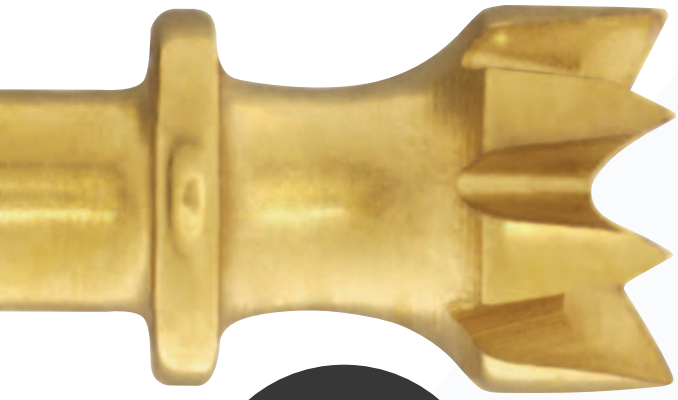

NEW INSERTS!
PATENTED TECHNOLOGY!

PIEZOSURGERY®

Implant site preparation with PIEZOSURGERY®, the revolutionary technique – safe and precise!

- less inflammatory cells compared to implant site preparation with drills
- more active neo-osteogenesis
- better control of site preparation
- significant bone preservation
- easier and more precise bone perforation thanks to the new PILOT inserts
- positioning of implants up to 5 mm diameter

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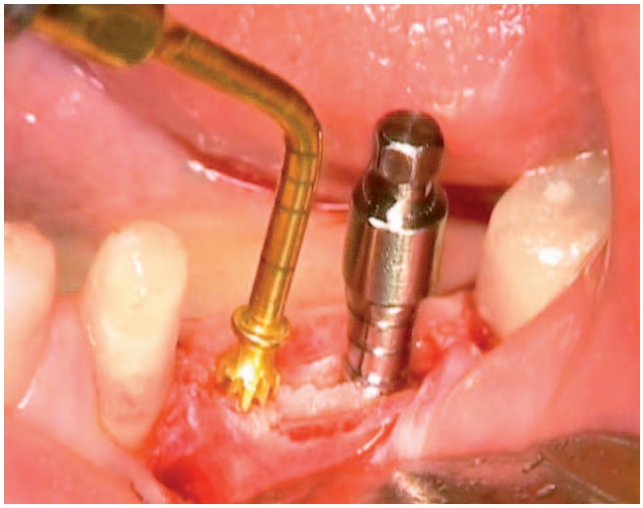
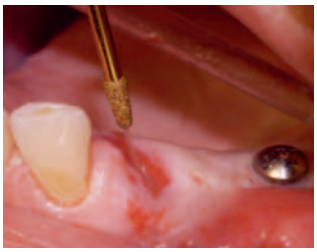
medical technology

THE CLINICAL EFFICACY




Volume 78 • Number 4

Cytokines and Growth Factors Involved in the Osseointegration of Oral Titanium Implants Positioned Using Piezoelectric Bone Surgery Versus a Drill Technique: A Pilot Study in Minipigs

Giulio Preti,* Germana Martinasso,† Bruno Peirone,‡ Roberto Navone,* Carlo Manzella,* Giuliana Muzio,† Crescenzo Russo,* Rosa A. Canuto,† and Gianmario Schierano*

Background: Most dental implants are positioned using a drilling surgery technique. However, dentistry recently experienced the implementation of piezoelectric surgery. This technique was introduced to overcome some of the limitations involving rotating instruments in bone surgery. This study used biomolecular and histologic analyses to compare the osseointegration of porous implants positioned using traditional drills versus the piezoelectric bone surgery technique.

Methods: Porous titanium implants were inserted into minipig tibias. Histomorphology and levels of bone morphogenetic protein (BMP)-4, transforming growth factor (TGF)-β2, tumor necrosis factor-alpha, and interleukin-1β and -10 were evaluated in the peri-implant osseous samples.

Results: Histomorphological analyses demonstrated that more inflammatory cells were present in samples from drilled sites. Also, neo-osteogenesis was consistently more active in bone samples from the implant sites that were prepared using piezoelectric bone surgery. Moreover, bone around the implants treated with the piezoelectric bone surgery technique showed an earlier increase in BMP-4 and TGF-β2 proteins as well as a reduction in proinflammatory cytokines.

Conclusion: Piezoelectric bone surgery appears to be more efficient in the first phases of bone healing; it induced an earlier increase in BMPs, controlled the inflammatory process better, and stimulated bone remodeling as early as 56 days post-treatment. *J Periodontol 2007;78:716-722.*

KEY WORDS

Bone morphogenetic proteins; cytokines; dental implants.

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‡ Department of Animal Pathology, University of Turin.

To enhance peri-implant osseogenesis and reduce the bone healing time after implant site preparation, the biologic factors that are involved in these processes must be evaluated. Literature supports the hypothesis that a porous implant surface is more effective in stimulating peri-implant osteogenesis than is a machined one using traditional drilling.[1-3] When bone formation was evaluated by histologic analysis,[4] levels of biologic factors, bone morphogenetic protein (BMP)-4 and transforming growth factor (TGF)-β, increased earlier around porous implants.

BMP-4 contains several proteins that have bone-inducing capacities. BMPs are key regulators of osteoblast and chondrocyte differentiation during skeletal development and of osteogenic differentiation in healing fractures.[5-7] TGF-β stimulated bone formation in vivo,[8-11] which may have resulted from the stimulated proliferation of osteoblast precursors rather than stimulated osteoblastic differentiation.[12] Thus, it may be postulated that TGF-β could stimulate BMP activity in the early phases of bone healing, just before the BMPs exert their effects.

Dental implants are positioned most commonly using a surgery technique

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THE SCIENCE

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Preti G, Martinasso G, Peirone B, Navone R, Manzella C, Muzio G, Russo C, Canuto RA, Schierano G.; J Periodontol. 2007; 78(4):716-722

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CONCLUSION: Piezoelectric bone surgery appears to be more efficient in the first phases of bone healing; it induced an earlier increase in BMPs, controlled the inflammatory process better, and stimulated bone remodeling as early as 56 days post-treatment.

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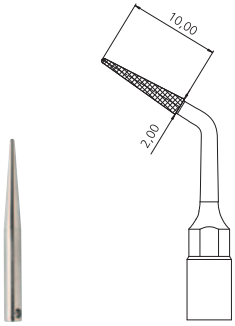
STEP BY STEP

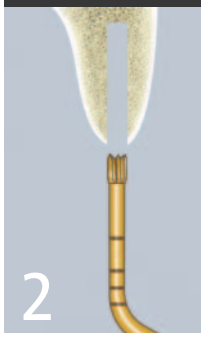
IM1

initial pilot osteotomy

OPTIONAL
check the preparation axis with alignment PIN IM 1

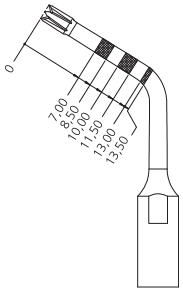


IM2

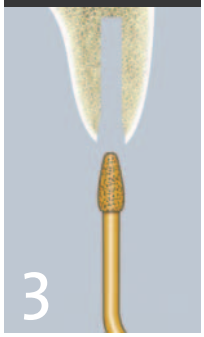


pilot osteotomy in anterior or posterior region

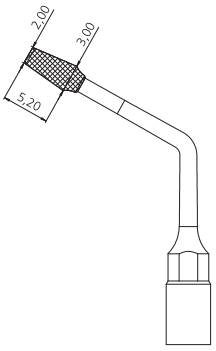
OPTIONAL
check the preparation axis with alignment PIN 2-2.4



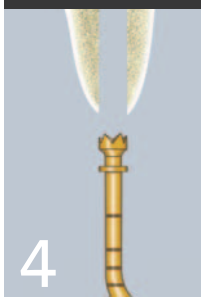
IP2-3



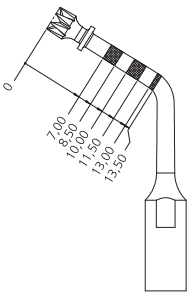
to optimize concentricity of implant site preparation between Ø 2 and Ø 3 mm, preparation of the cortical basal bone



IM3

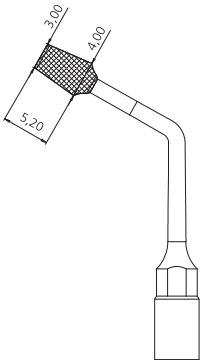


to enlarge or to finalize the implant site preparation; insert with double irrigation to avoid overheating



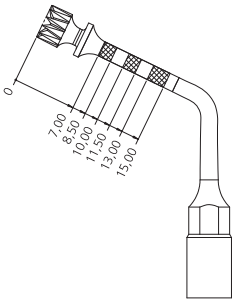
IP3-4

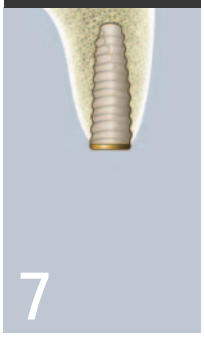
to optimize concentricity of implant site preparation between Ø 3 and Ø 4 mm, preparation of the cortical basal bone



IM4

to finalize the implant site preparation; insert with double irrigation to avoid overheating



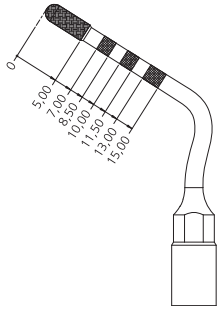


implant positioning

OT4

to correct pilot osteotomy axis (differential implant site preparation), to finalize the implant site preparation close to the alveolar nerve

OPTIONAL



The inserts for the implant site preparation are dedicated to bone quality of the maxilla.

IMPLANT SITE PREP KITS

IMPLANT PREP KIT PRO

EQUIPPED WITH:

- IM1, IM2A, IM2P, IM3A, IM3P, OT4, IM4A, IM4P, IP2-3, IP3-4, 3 PINS IM1, 3 PINS 2-2.4, Implant insert tray

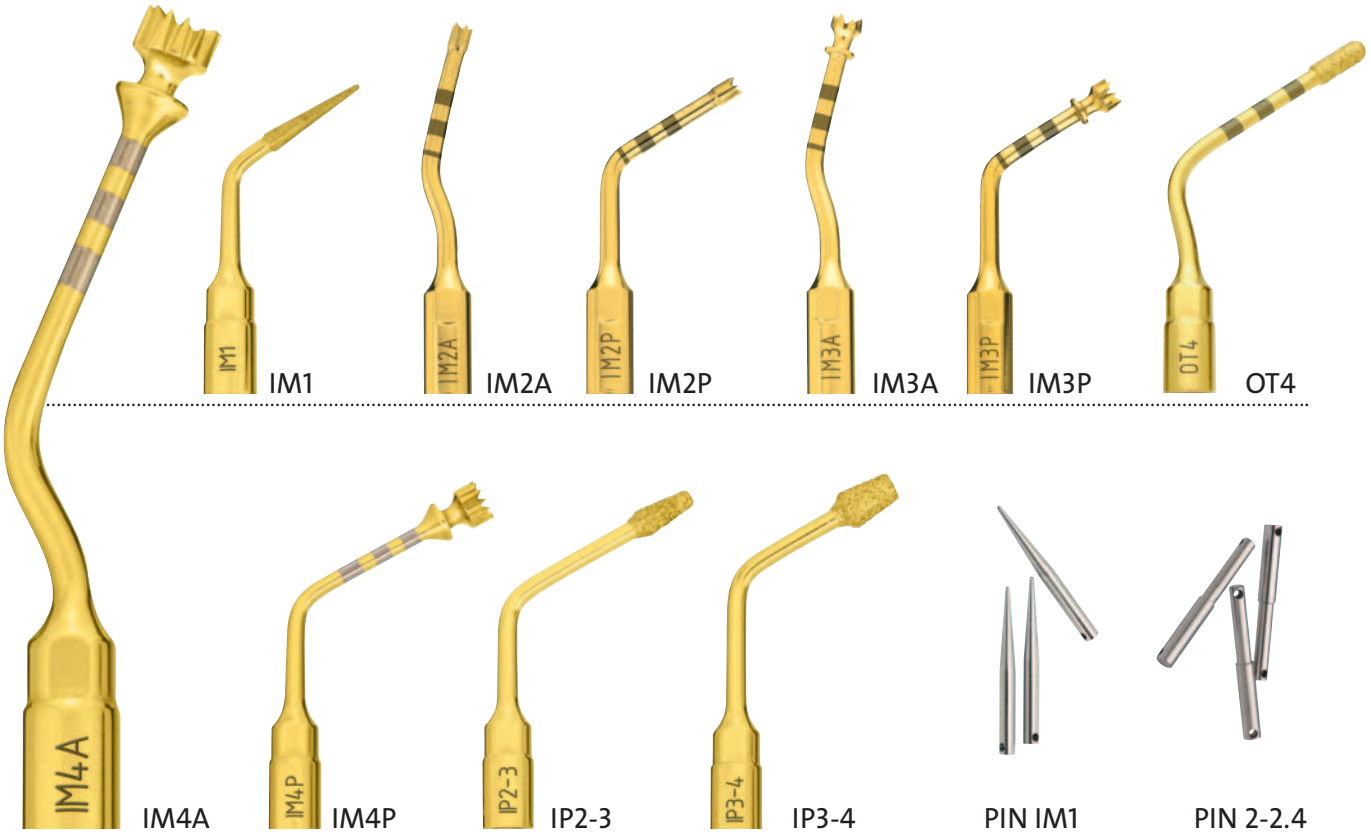
IMPLANT PREP KIT

WITH A KIT YOU SAVE UP TO **20%** COMPARED TO A PURCHASE OF SINGLE INSERT

EQUIPPED WITH:

- IM1, IM2A, IM2P, IM3A, IM3P, OT4, Implant insert tray

IMPLANT SITE PREP INSERTS



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