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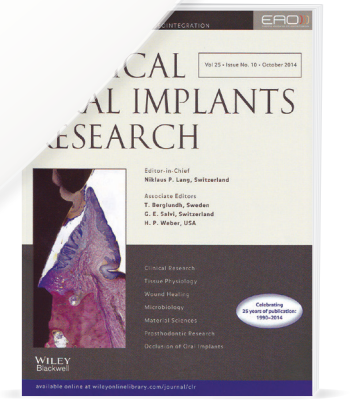
Osseoinductive Elements for Promoting Osseointegration around Immediate Implants: A Pilot Study in the Foxhound Dog" *

O. Salomó-Coll; J. E. Maté-Sanchez de Val;
M. P. Ramírez-Fernández; M. Satorres-Nieto;
J. Gargallo-Albiol; J. L. Calvo-Guirado



*Salomo-Coll O, Mate-Sanchez de Val JE, Ramı rez-Fernandez MP, Satorres-Nieto M, Gargallo-Albiol J, Calvo-Guirado JL. Osseoinductive elements for promoting osseointegration around immediate implants: a pilot study in the foxhound dog. Clin. Oral Impl. Res. 00, 2015; 1–9. doi: 10.1111/clr.12596.

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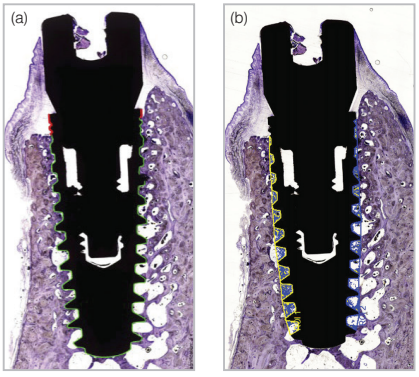

(a) BIC scheme: Green lines shows Total BIC and red line show crestal bone loss; (b) BIC scheme: Yellow line delimitates interthread space and blue line shows New Bone Formation.

Authors' affiliations

O. Salomó-Coll, M. Satorres-Nieto, J. Gargallo-Albiol, Department of Oral and Maxillofacial Surgery, International University of Catalonia, Barcelona, Spain.

J. E. Maté-Sánchez de Val, M. P. Ramírez-Fernández, J. L. Calvo-Guirado, Faculty of Medicine and Dentistry, University of Murcia, Murcia, Spain.

SUMMARY.

Objectives

The aim of this study was to evaluate the effects of topical applications of melatonin over implant surfaces placed immediately after extraction by means of histological and histomorphometric analysis of peri-implant tissues.

Material and methods

Six American foxhound dogs were used in the study; mandibular premolar distal roots were extracted. Thirty-six immediate conical implants (C1 Implants, MIS® Implants Technologies Ltd.) were randomly assigned to the distal site on each site of the mandible in three groups: (Group CI) 12 titanium implants alone; (Group MI) 12 titanium implants supplemented with melatonin; and (Group DI) 12 titanium implants supplemented with vitamin D (DI). Prior to implanting test, implants (MI) were submerged in melatonin 5% solution, and implants from (DI) group were submerged in vitamin D 10% solution. No treatment was applied at control implants. After 12 weeks, animals were sacrificed. Block sections were obtained and processed for mineralized ground sectioning. Bone-to-implant contact (total BIC), new bone formation (NBF), inter-thread bone (ITB) and histological linear measurements (HLM) were analyzed.

Results

At 12 weeks, all implants were clinically stable and histologically osseointegrated. Total BIC values were 48.36 ± 7.45* for the MI group and 44.82 ± 10.98 for the CI group ($P = 0.035$) with statistically significant difference between groups. BIC% were 41.36 ± 3.93 for MI and 41.34 ± 9.26 for CI ($P > 0.05$). Inter-thread bone formation values were MI 15.99 ± 2.43* and CI 14.79 ± 3.62 ($P = 0.03$), MI showing significantly better results. No statistically significant differences in peri-implant new bone formation could be found between the two groups: MI 25.37 ± 2.32, CI 26.55 ± 7.75 ($P > 0.05$). Linear measurements showed that the MI group showed significantly less lingual crestal bone loss (CBL) (MI 0.52 ± 0.74*, CI 0.92 ± 1.98) ($P = 0.045$) and less lingual peri-implant mucosa (PIM) (MI 3.13 ± 1.41*, CI 3.71 ± 1.81) ($P = 0.042$). No significant differences were observed in the buccal aspect.

Conclusions

Within the limitations of this animal study, the topical application of melatonin improved bone formation around immediate implants and reduced lingual bone and lingual periimplant mucosa, after 12 weeks of osseointegration.