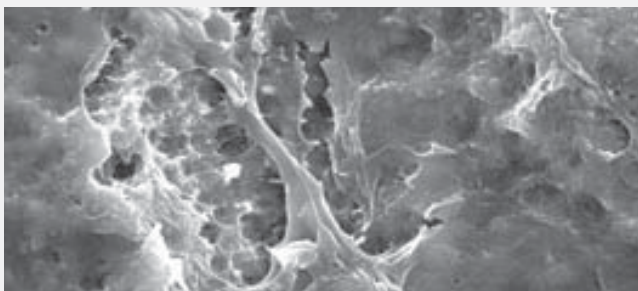


5

Volume 5.

Scientific
studies



mis[®]
MAKE IT SIMPLE

MIS is proud to introduce a new collection of studies featuring some of the scientific work that has been done with MIS products. MIS promotes research, in an ongoing effort to validate and scientifically support its products and recommended procedures. In addition, several of these studies enable MIS to evaluate and promote novel innovations through testing in distinguished universities and research institutions, to ensure safety and long lasting solutions for both dentists and patients.



Published by MIS, which reserves the right to ameliorate the products described in this manual as well as to revise this publication at any time and without informing any person of such revision or change. All rights reserved. No part of this publication may be reproduced, transcribed, stored in an electronic retrieval system translated to any language or computer language, or be transmitted in any form whatsoever without a written consent of the publisher.



Dear friends and colleagues,

At MIS, we never stop asking questions. Implant literature is much more extensive today than it was twenty years ago, yet there are still many unsolved questions. Some of the most basic concepts in dental implantology have been challenged. After decades of acceptance, some are found to be false, while some are consistently found to be true.

In our quest toward designing better products, we hunger to know more. Therefore, we constantly support research related to our current products, as well as for future technologies, materials, and procedures.

It is an honor for MIS to collaborate with a multitude of universities and research institutions around the world, as well as distinguished clinical and basic scientists who share our passion for new knowledge. MIS currently runs clinical and basic studies not only in Israel and the United States, but in Spain, Portugal, Sweden, Italy, Greece, Croatia, Romania, France, Turkey, Argentina, Colombia, Chile, Panama, the Dominican Republic, Hong Kong and Vietnam as well.

We wish to thank the researchers who work with us, and especially to those whose work is presented here.

Our research projects range from basic science to clinical assessments of our products and procedures, and to data collection for alterations in current techniques. We study technology that heals bone faster around an implant, and drilling procedures that will allow faster bone growth. We examine technology that will prevent bone loss around implants, while also looking at technology that may help regain lost bone. We look at products that aid in the healing of oral inflammation, as well as the biomechanics of abutment-implant connections. We analyze augmentation products and their interactions, and focus on procedures that will enhance outcomes for the benefit of both patient and dentist. And in-house, we are constantly searching for superior raw materials, technology, and procedures that will help Make It Simpler.

Those interested in scientific literature can get an idea of what MIS is currently doing by reading our research leaflets and booklets. Others may want to delve deeper and read the manuscripts themselves. In both cases, we at MIS want to guarantee that you are aware of our constant pledge to testing and evaluating our products, and to ensure your success and your patients' safety.

Come visit us at a dental conference near you, or at our next Global symposium in Cannes, France to see our latest innovations.

Yours,

Dr. Nachum Samet

V. P. for Research & Development

Index.

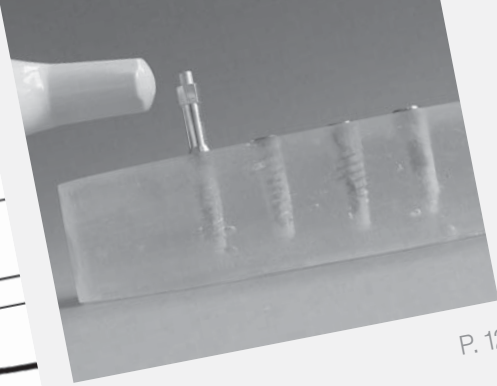
Implants

- P.8 A rough surface implant neck with microthreads reduces the amount of marginal bone loss: a prospective clinical study.
- P.10 Initial Stability of Two Dental Implant Systems: Influence of Buccolingual Width and Probe Orientation on Resonance Frequency Measurements.
- P.12 Clinical and Radiographic Evaluation of 7,340 SEVEN® Implants. Osseointegration Rate and Bone Level Stability: 5 Years Prospective Study.
- P.14 Retrospective Multicenter Evaluation of Tapered Implant With a Sandblasted and Acid-Etched Surface at 1 to 4 Years of Function.
- P.16 The Immediate Functional Loading of SEVEN and Mistral Implants with New Multi Unit Titanium Abutments. 24 Months Follow Up Report.
- P.18 Clinical and Radiological Evaluation of 70 Immediately Loaded Single Implants in the Maxillary Esthetic Zone: Preliminary Results After 1 Year of Functional Loading.
- P.20 Bone Tissue Integration with Immediately Loaded Implants in Aesthetic Zone. A Four Year Prospective Clinical Study.
- P.22 A comparative study of bone densitometry during osseointegration: Piezoelectric surgery versus rotary protocols.
- P.24 Cooling Profile Following Prosthetic Preparation of 1-Piece Dental Implants.
- P.26 Heat Production During Prosthetic Preparation of a One-Piece Dental Implant.
- P.28 Reimplantation of Dental Implants following Ligature-Induced Peri-Implantitis: A Pilot Study in Dogs.
- P.30 A Novel Device for Resonance Frequency Assessment of One-Piece Implants.

- P.32 Bacterial and inflammatory behavior of implants in the early healing phase of chronic periodontitis.
- P.34 Adjusting dento-alveolar morphology with orthodontic mini-implants (miniscrews). A clinical case report.
- P.36 Skeletal Implant Anchorage in the Treatment of Impacted Teeth-A Review of the State of the Art.
- P.38 Behavior of two osteoblast-like cell lines cultured on machined or rough titanium surfaces.
- P.40 Thermal changes and drill wear in bovine bone during implant site preparation. A comparative in vitro study: twisted stainless steel and ceramic drills.

Bone grafting

- P.44 Comparison of Bone Grafting Materials in Human Extraction Sockets: clinical, histologic and histomorphometric evaluations.
- P.46 BONDBONE® in Post-extraction Sockets: Clinical Application and Histomorphometric Evaluation - Preliminary Results.
- P.48 Histomorphometric Analysis of Maxillary Sinus Augmentation Using an Alloplast Bone Substitute.
- P.50 Enhancing Extraction Socket Therapy with a Biphasic Calcium Sulfate.
- P.52 Efficacy of Cancellous Block Allograft Augmentation Prior to Implant Placement in the Posterior Atrophic Mandible.
- P.54 Use of Corticocancellous Allogeneic Bone Blocks for Augmentation of Alveolar Bone Defects.

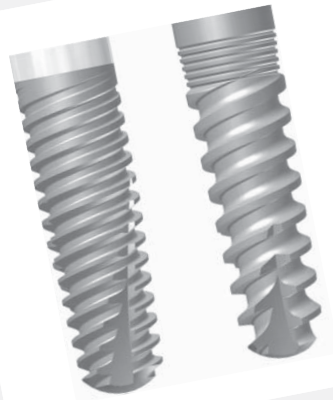


P. 12

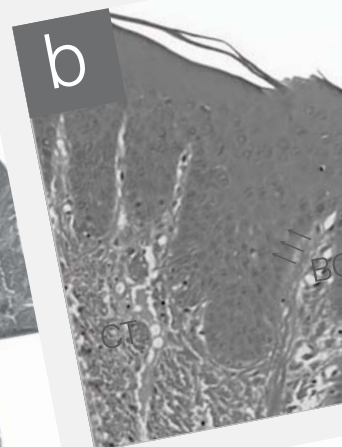
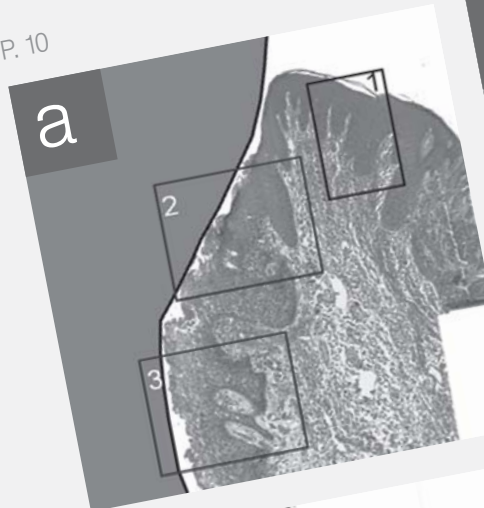


P. 20

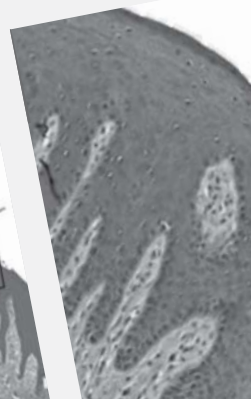
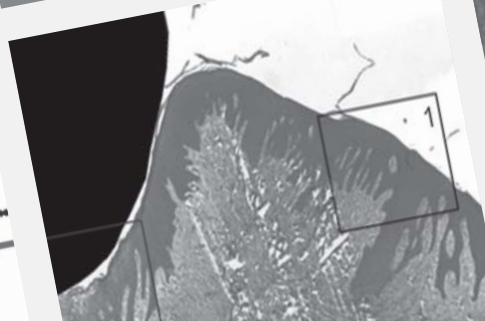
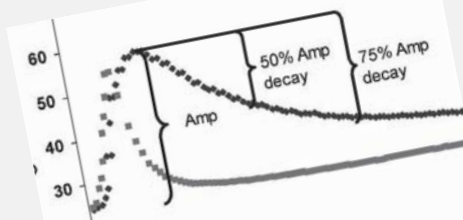
P. 6



P. 10



P. 18





Implants

August
2009

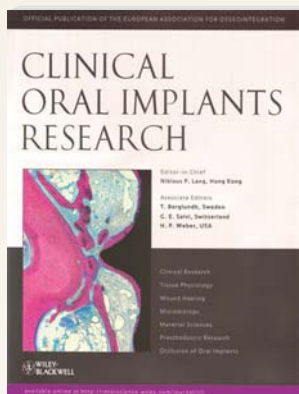
Published in:

CLINICAL ORAL IMPLANTS RESEARCH

”

A rough surface implant neck with microthreads reduces the amount of marginal bone loss: a prospective clinical study”

Emanuel A. Bratu¹, Moshik Tandlich², Lior Shapira²



* Bratu EA, Tandlich M, Shapira L. A rough surface implant neck with microthreads reduces the amount of marginal bone loss: a prospective clinical study. Clinical Oral Implants Research. 20, 2009; 827–832.

ABSTRACT.

Objectives

An intra-individual controlled clinical trial was conducted to evaluate and compare the amount of marginal bone loss (MBL) found around implants of a comparable design, with or without retention grooves (microthreads) or polished necks, during the early stages of healing.

Materials and Methods

Forty-eight (48) patients with missing mandibular posterior teeth were treated with two commercially available implants of the same brand (MIS): one with microthreads (S-model) and the other with a polished neck (L-model). MBL around each implant was measured on follow-up radiograms taken 4 months after placement (exposure and crown cementation), and 6 and 12 months after loading.

Results

Forty-six (46) patients completed the study, making 46 implant pairs available for statistical analysis. None of the implants failed to integrate. All the implants displayed some extent of bone loss throughout the follow-up period. At each time point (exposure, 6 and 12 months after loading), the S-model implants displayed statistically significant lower amounts of bone loss (0.22 vs. 0.76, 0.57 vs. 1.22 and 0.9 vs. 1.5mm, respectively). Other than the type of the implant, no correlation was found between MBL and the implant stability values (PerioTest), dimensions, site of insertion or any of the other collected variables.

Conclusion

Implants with a roughened neck surface and microthreads are more resistant to MBL during the first phases of healing, as compared with implants with a polished neck.



The two evaluated implants. L-model (left) with a 1-mm polished neck and with no retention grooves, and S-model (right) implant with retention grooves (microthreads) and rough surface body and neck.

Authors' affiliations

¹Department of Implant Restorations, University of Medicine and Pharmacy, Timisoara, Rome, Italy.

²Department of Periodontology, Hadassah Medical Center, Jerusalem, Israel.

September
2010

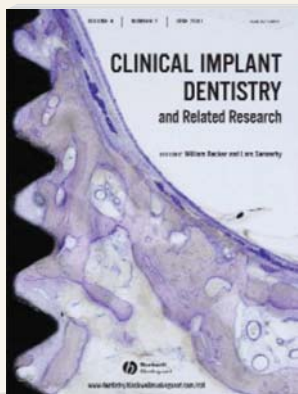
Published in:

**CLINICAL IMPLANT
DENTISTRY**
and Related Research

”

Initial Stability of Two Dental Implant
Systems: Influence of Buccolingual
Width and Probe Orientation on
Resonance Frequency Measurements”*

Tolga F. Tözüm, DDS, PhD¹; Ilser Turkyilmaz, DDS, PhD²;
Bilge Turhan Bal, DDS, PhD³



* Tolga F. Tözüm DDS, PhD, Ilser Turkyilmaz DDS, PhD, Bilge Turhan Bal DDS, PhD. Clinical Implant Dentistry and Related Research, Volume 12, Issue 3, pages 194–201, September 2010

ABSTRACT.

Background

Although many factors seem to have an impact on the resonance frequency (RF) values of implants, there is a lack of evidence about some other parameters, which may have an influence on implant stability.

Purpose

The aims of the study were to determine whether initial stability of a dental implant differs when the buccolingual width of the bone changes, to determine whether different orientations affect the RF measurements in the RF device, and to investigate two dental implants with different morphologies with regard to their initial stability.

Materials and Methods

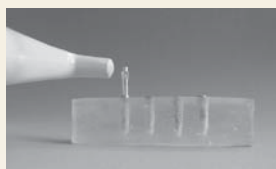
Two implant systems (Tidal Spiral Dental Implant Systems, Huntsville, AL, USA, and MIS Seven, MIS Implants Technologies Ltd., Shlomi, Israel) with diameters of 3.75 mm and 4.2 mm and with a length of 13 mm were used. Following the insertion of implants, buccolingual thinning of the models was performed in 2-mm increments ranging between 0 and 8 mm.

Results

A statistically significant decrease for implant stability quotient (ISQ) values was noticed for both diameters and both systems for all dimensional time points of the blocks ($p < .05$). The second system (more number of threads) resulted with higher ISQ values for both diameters than the first system (lower number of threads) ($p < .001$). The orientation of the probe influenced the measurements, where a standard orientation is advisable for the magnetic RF device.

Conclusion

Different implant surface geometries seem to behave in different patterns in terms of initial stability. Dimensional changes in buccolingual direction seem to have an impact on the initial stability, where wider implants also presented higher ISQ values than narrow ones.



The probe of the wireless RF device is held in mesiodistal direction close to the peg during the measuring process. (RF = resonance frequency.)

Authors' affiliations

¹Associate professor, Department of Periodontology, Faculty of Dentistry, Hacettepe University, Ankara, Turkey.

²Assistant professor, Department of Prosthodontics, University of Texas Health Science Center at San Antonio, TX, USA.

³Assistant professor, Department of Prosthodontics, Faculty of Dentistry, Gazi University, Ankara, Turkey.

May
2011



* Presented at:

MIS GLOBAL
CONFERENCE 2011

”

Clinical and Radiographic Evaluation of
7,340 SEVEN[®] Implants. Osseointegration
Rate and Bone Level Stability: 5 Years
Prospective Study.”*

¹ Zabarar D, Bouboulis S, Spanos A, Petsinis V, Gissakis



* Poster presented at MIS Global Conference, Cancun 2011

ABSTRACT.

Aim

The aim of this paper is to present the results after 1 to 5 years observation of an ongoing clinical and radiographic study regarding:

- osseointegration rate
- peri-implant bone level changes
- survival rate after loading of Seven® implants, used to support fixed prostheses.

Material and Method

The material came from the Dept. of Dental Implants of Hygeia Hospital (Athens, Greece), where this study was conducted. 1945 patients (894 male, 1051 female) participated in the study. In total, 7340 implants were placed. The evaluation period was 12-60 months. All patients underwent detailed clinical and radiographic examination 6 months, or earlier in cases of bruxism, heavy smoking and diagnosed periimplantitis.

Conclusions

- Seven implant system is reliable and easy to use in all cases of implant placement, both in host and augmented bone.
- The results of the study showed exceptional osseointegration rate of 99.71%.
- The application of bone regeneration methods does not interfere with osseointegration.
- Marginal bone loss around implants was minimal.
- Implant survival rate after loading was 99.75%.

Table: Cumulative implants success & survival rates.

Year	No. of implants placed	Implant success (%)	Implant survival (%)
2006	274	98.9	100
2007	943	99.3	100
2008	1733	99.7	99.9
2009	2114	99.9	99.8
2010	2276	99.8	99.7
Total	7340	99.7	99.7

Authors' affiliations

¹ Dept Dental Implants & Tissue Regeneration, Hygeia Hospital, Athens, Greece

August
2011

Published in:

Implant Dentistry

”

Retrospective Multicenter Evaluation of Tapered Implant With a Sandblasted and Acid-Etched Surface at 1 to 4 Years of Function”*

Min-Su Bae, DDS¹, Dong-Seok Sohn, DDS, PhD², Mi-Ra Ahn, DDS³,
Hyun-Woo Lee, DDS⁴, Heui-Seung Jung⁴, DDS, and Im-Hee Shin, MD, PhD⁵



* ISSN 1056-6163/11/02004-280, Implant Dentistry, Volume 20, Number 4, Copyright
© 2011 by Lippincott Williams & Wilkins, DOI: 10.1097/ID.0b013e318216123b

ABSTRACT.

Purpose

The aim of this retrospective study was to evaluate the cumulative survival rate of tapered implant with a sandblasted and acid-etched surface placed in edentulous patients.

Materials and Methods

A retrospective study was performed by evaluating MIS SEVEN[®] implants consecutively placed from December 2004 to January 2008. Patient records were reviewed to determine gender, age at implant placement, implant location, prosthesis type, marginal bone loss according to treatment procedure, number of implants, and number of failed implants. The survival rate of the implants was analyzed, and radiographic evaluation was performed.

Results

A total of 294 implants were placed in 92 patients at the 3 centers. The observation period after implantation ranged from 22 to 59 months, with a mean of 38 months. The cumulative survival rate of MIS SEVEN[®] implants was 97.3%. After 1 year of functional loading, the mean marginal bone loss was 0.33 mm.

Conclusion

This retrospective, multicenter study demonstrates that this dental implant system gives clinically reliable results.



Periapical radiograph taken 12 months after loading.



Implant placement using handpiece.

Authors' affiliations

¹ Resident, Department of Dentistry and Oral and Maxillofacial Surgery, Catholic University Hospital of Daegu, Daegu, Republic of Korea.

² Chairman, Department of Dentistry and Oral and Maxillofacial Surgery, Catholic University Hospital of Daegu, Daegu, Republic of Korea

³ Clinical Instructor, Department of Dentistry and Oral and Maxillofacial Surgery, Catholic University Hospital of Daegu, Daegu, Republic of Korea.

⁴ Private Practice, Daegu, Republic of Korea.

⁵ Associate Professor, Department of Medical Statistics, Catholic University Hospital of Daegu, Daegu, Republic of Korea.

September
2011

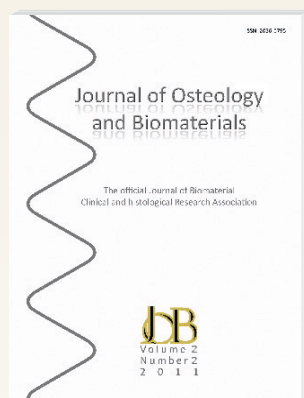
Published in:

Journal of Osteology and Biomaterials

”

The Immediate Functional Loading of SEVEN and Mistral Implants with New Multi Unit Titanium Abutments. 24 Months Follow Up Report.” *

Luca Di Alberi ¹⁻³, Dario Bertossi ², Federica Donnini ³, Fabio Tamborrino ¹⁻⁴, Teocrito Carlesi ⁵, Pierfrancesco Nocini ², Lorenzo Lo Muzio ¹



* Luca Di Alberi, Dario Bertossi, Federica Donnini, Fabio Tamborrino, Teocrito Carlesi, Pierfrancesco Nocini, Lorenzo Lo Muzio. Journal of Osteology and Biomaterials, 2011; 2: 117-123.

ABSTRACT.

Aim

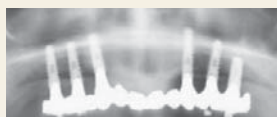
The ultimate goal of an immediate loading protocol is to reduce the number of surgical interventions and shorten the time frame between surgery and prosthetic delivery, all without sacrificing implant success rates. The aim of this study was to evaluate the use of new titanium abutments for screw retained prosthetics in edentulous patients in a immediate loading procedure in order to reduce the number of surgical steps.

Materials and Methods

20 patients completely edentulous, 10 maxilla and 10 mandibles were treated with 6 implants and 5 implants respectively for a total of 110 implants. All patients received SLA screw-shape SEVEN® and-or Mistral implants (MIS, Shlomi, Israel). The treatment objective involved delivery of the provisional prosthesis within 4 hours of implant placement, final rehabilitation was completed 6 months later. The patients were on a strict recall program during the first 6 months and Periapical radiographs were also performed subsequently, after 3,6,12 and 24 months of occlusal loading.

Results and Conclusions

One implant was lost out of 110 inserted. The observed marginal bone change around immediate loaded implants was similar to that reported for delayed loading implants in the literature. The immediate loading of SLA surface SEVEN® and Mistral implants for support of full-arch prostheses represent a viable therapy for the totally edentulous maxilla and mandible.



24 months X-ray follow-up of full arch immediate loading with screwed titanium components firstly and finally with screwed Toronto bridge over Seven and Mistral implants.

Authors' affiliations

¹Department of dental sciences, University of Foggia.

²Section of Oral and Maxillofacial surgery department of surgery, University of Verona, Italy.

³Private practice, Chieti, Italy.

⁴Private practice, Lecce, Italy.

⁵Private practice, Vasto (Ch), Italy.

January
2012

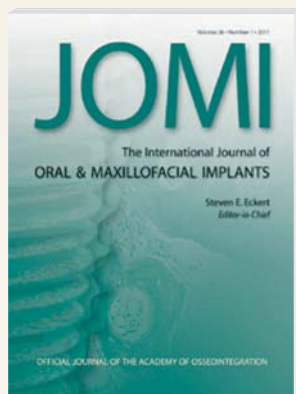
Published in:

JOMI

”

Clinical and Radiological Evaluation of 70 Immediately Loaded Single Implants in the Maxillary Esthetic Zone: Preliminary Results After 1 Year of Functional Loading”*

Luca Di Alberti, DDS, PhD¹; Federica Donnini, RDH¹;
Claudio Di Alberti, DDS, MSc¹; Michele Camerino, DDS¹;
Nicole Sgaramella, MD, DDS²; Lorenzo Lo Muzio, MD, DDS, PhD³



* The International Journal of Oral & Maxillofacial Implants, 2012, 27:181-186.

ABSTRACT.

Objectives

A key challenge in implant treatment in the esthetic zone is to provide patients with crowns and peri-implant mucosa that are in harmony with the adjacent teeth to restore both function and esthetics. The aim of the present study was to show the preliminary results of the immediate loading protocol in the maxillary esthetic zone that is designed to preserve the soft tissue.

Materials and Methods

Patients were treated with immediately loaded single-tooth implants (SEVEN®, MIS). Implants were inserted in fresh postextraction sites with clinically and radiologically healed bone. After 8 weeks of loading, the provisional crowns and abutments were modified as needed to enhance the esthetics of the gingival margins. Definitive restorations were delivered 4 to 6 months postoperatively.

Results

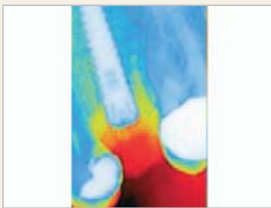
Seventy patients were treated: 25 implants were placed in fresh extraction sites, and the remaining 45 implants were inserted in healed single edentulous sites. All implants were stable, and radiographs showed complete Osseointegration after 1 year of functional loading.

Conclusion

The present study shows promising results for immediate loading of single implants. All implant sited fulfilled success criteria in terms of function and esthetics, and particularly promising results were seen following additional adjustments of the provisional restorations to preserve interdental papilla.



One year follow-up appearance.



Radiographs showing fracture and decayed root of maxillary left second premolar - the implant at placement.

Authors' affiliations

¹ Private Practice, Chieti-Pescara, Italy.

² Visiting Professor, Dental School, University of Foggia, Italy.

³ Professor and Head of Department, Dental School, University of Foggia, Italy.

September
2011

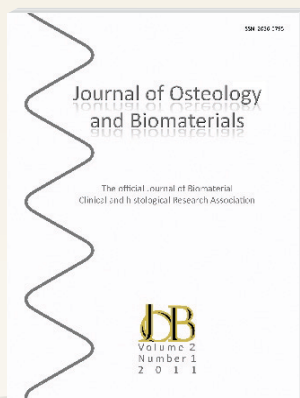
Published in:

Journal of Osteology and Biomaterials

”

Bone Tissue Integration with Immediately Loaded Implants in Aesthetic Zone. A Four Year Prospective Clinical Study.”*

Luca Di Alberti ,DDS,PhD¹, Federica Donnini ², Michele
Camerino, DDS², Claudio Di Alberti, DDS, MSc²,
Lorenzo Lo Muzio MD, DDS, PhD³



* Luca Di Alberti ,DDS,PhD, Federica Donnini, Michele Camerino, DDS, Claudio Di Alberti, DDS, MSc, Lorenzo Lo Muzio MD, DDS, PhD. Journal of Osteology and Biomaterials, 2011; 1: 33-41.

ABSTRACT.

Aim

In the aesthetic zone, a key challenge for the restorative dentist is to provide patients with a crown and periimplant mucosa that are in harmony with the adjacent teeth, thus restoring both function and esthetics. The aim of this study is to confirm this data and introduce a new concept for the creation of Papilla.

Materials and Methods

70 patients were treated with single tooth implants with immediate functional loading for a provisional crown. 25 SEVEN® implants (MIS, Israel) were inserted in single post-extraction sites and the remaining 45 SEVEN® implants (MIS, Israel) were inserted in healthy bone.

Results and Conclusions

All implants were stable and radiographically osteointegrated after 12 months of control. No implant failure was recorded. Results from the present study show promising results on the immediate loading of single implants for the replacement of missing teeth. Promising results are also shown advocating the compression of the papilla eight weeks after implant placement for the maintenance of bone and papilla height.



SEVEN® implant inserted at time 0 and at 2 week. Mesial and distal bone peaks are preserved.

Authors' affiliations

¹ Contract Professor in Implant Prosthetics, University of Foggia, Italy.

² Private Practitioners, Chieti- Pescara, Italy.

³ Professor and Director, Dental Department, University of Foggia, Italy.

September
2010

Published in:



(Quintessence International)

”

A comparative study of bone densitometry during osseointegration: Piezoelectric surgery versus rotary protocols”*

Luca Di Alberti, DDS, PhD¹; Federica Donnini, RDH²;
Claudio Di Alberti, DDS²; Michele Camerino, DDS³



* Luca Di Alberti, Federica Donnini, Claudio Di Alberti, Michele Camerino. A comparative study of bone densitometry during osseointegration: Piezoelectric surgery versus rotary protocols. Quintessence International. 2010, 41 (8): 639-641.

ABSTRACT.

Objectives

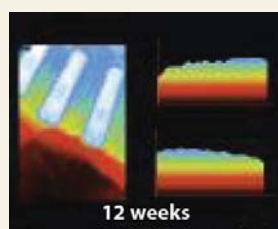
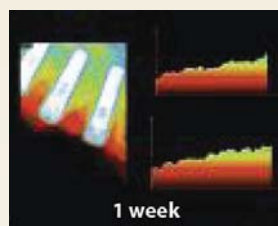
To date, there have been no studies on the outcome of osseointegration of alveolar bone around dental implants inserted with piezoelectric osteotomy versus conventional osteotomy. The aim of this study was to compare the radiographic differences, through evaluation of peri-implant bone density, between implant insertion using traditional surgical technique and piezoelectric technique.

Materials and methods

Forty patients were selected whose treatment consisted of a minimum of two implants placed in nonpathologic native bone. A single type of implant surface (SLA) was chosen. The implants were placed following the manufacturer protocol for traditional surgical technique and piezoelectric technique. Radiographs were taken following surgery and 30, 60, and 90 days after surgery. The bone density was studied with the densitometry application.

Results and Conclusions

All patients completed the study period with success. Despite a limited number of treated patients, the results of this pilot study demonstrated that (1) piezoelectric implant site preparation promotes better bone density and osteogenesis, and (2) the piezoelectric technique is predictable, with a 100% success rate in this study.



Bone densitometry 1 week after surgery and at 12-week follow-up with traditional (left implant) and piezosurgical site preparation (right implant). Similar bone density is shown in this clinical case.

Authors' affiliations

¹Visiting Professor, Department of Dental Sciences, University of Foggia, Foggia, Italy.

²Private practitioner, Pescara, Italy.

³Private practitioner, Chieti, Italy.

August
2010

Published in:

JOI

(Journal of Oral Implantology)

”

Cooling Profile Following Prosthetic Preparation of 1-Piece Dental Implants" *

Omer Cohen, DMD, PhD; Eran Gabay, DMD, PhD; Eli E. Machtei, DMD



*Omer Cohen, Eran Gabay, Eli E. Machtei. Cooling Profile Following Prosthetic Preparation of 1-Piece Dental Implants. Journal of Oral Implantology. 2010, 36(4): 273-279.

ABSTRACT.

Purpose

The aim of this study was to evaluate the effect of water irrigation on heat dissipation kinetics following abutment preparation of 1-piece dental implants. UNO 1-piece dental implants were mounted on Plexiglas apparatus clamping the implant at the collar. T-type thermocouple was attached to the first thread of the implant and recorded thermal changes at 100 millisecond intervals. Implants were prepared using highspeed dental turbine at 400 000 RPM with a coarse diamond bur. Once temperature reached 47°C, abutment preparation was discontinued.

Materials and methods

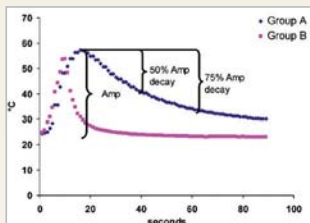
Thirty implants were divided into 2 groups. Group A: Passive cooling without water irrigation. Group B: Cooling with turbine's water spray adjacent to the implant (30 mL/min). The following parameters were measured: T47 (time from peak temperature to 47°C), T50%, T75% (time until the temperature amplitude decayed by 50% and 75%, respectively), dTemp50%/dt decay, and dTemp75%/dt decay (cooling rate measured at 50% and 75% of amplitude decay, respectively).

Results

Water spray irrigation significantly reduced T47 (1.37 ± 0.29 seconds vs 19.97 ± 3.06 seconds, $P < 0.0001$), T50% (3.04 ± 0.34 seconds vs 27.37 ± 2.56 seconds, $P < 0.0001$), and T75% (5.71 ± 0.57 seconds vs 57.61 ± 5.47 seconds, $P < 0.0001$). Water spray irrigation also increased cooling capacity ninefold: dTemp50%/dt decay ($4.14 \pm 0.61^\circ\text{C/s}$ vs $0.48 \pm 0.06^\circ\text{C/s}$, $P < 0.0001$), and dTemp75%/dt decay ($1.70 \pm 0.29^\circ\text{C/s}$ vs $0.19 \pm 0.03^\circ\text{C/s}$, $P < 0.0001$).

Conclusions

The continuous use of water spray adjacent to the abutment following the cessation of implant preparation might prove beneficial for rapid cooling of the implant.



Typical thermal changes recording. Group A, without water irrigation; group B, with turbine water spray (30 mL/min). Amp indicates thermal amplitude calculated by subtracting baseline temperature from peak temperature; Amp 50% decay and Amp 75% decay, thermal amplitude decay of 50% and 75%, respectively.

Authors' affiliations

¹Department of Periodontology, Rambam Health Care Campus, and Faculty of Medicine-Technion (I.I.T.), Haifa, Israel.

December
2010

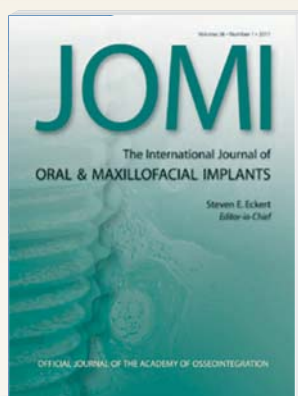
Published in:

JOMI

”

Heat Production During Prosthetic Preparation of a One-Piece Dental Implant”*

Eran Gabay, DMD, PhD¹; Omer Cohen, DMD, PhD¹;
Eli E. Machtei, DMD²



* Dr. Eran Gabay, Dr. Omer Cohen, Prof. Eli E. Machtei Heat Production During Prosthetic Preparation of a One-Piece Dental Implant. Int J. Oral Maxillofac Implants 2010;25:1131–1136

ABSTRACT.

Purpose

Preparation of a one-piece dental implant abutment is often needed to achieve a proper emergence profile for a definitive restoration. However, this procedure may compromise osseointegration through the production of heat. The aim of this study was to measure heat production during implant abutment preparation with different volumes of water irrigation using a one-piece implant system.

Materials and methods

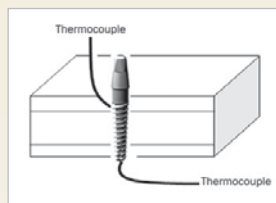
Forty-five one-piece dental implants were used in this study. The implants were divided into three groups according to the water flow rate used during abutment preparation: 30 mL/min (G30), 15 mL/min (G15), and without water irrigation (G0). Thermocouples were positioned at the most coronal and most apical threads. The abutments were prepared using a high-speed dental handpiece. Preparation continued for 120 seconds or until the implant temperature reached 47°C.

Results

The time needed to reach 47°C in the most coronal thread of group G0 was 5.73 ± 1.16 seconds. After the preparation was stopped at 47°C, the temperature continued to increase until reaching a maximum temperature. None of the implants in the water irrigation groups reached 47°C. The time needed to reach maximum temperature was significantly shorter for group G0 than the groups with water irrigation. A strong positive correlation was found between coronal and apical recordings.

Conclusion

Prosthetic preparation of one-piece dental implants without irrigation induced a rapid increase in temperature. Water irrigation reduced heat production during abutment preparation in a dose-dependent manner.



Thermocouples positioned at the most coronal and most apical threads of the implant.



Exposure of the implant abutment and isolation of the implant-acrylic glass complex with rubber dam.

Authors' affiliations

¹Postgraduate student, Department of Periodontology, School of Graduate Dentistry, Rambam Health Care Campus, and Technion, Faculty of Medicine, Haifa, Israel.

²Professor and Chair, Department of Periodontology, Head of School of Graduate Dentistry, Rambam Health Care Campus, and Technion, Faculty of Medicine, Haifa, Israel.

July
2011

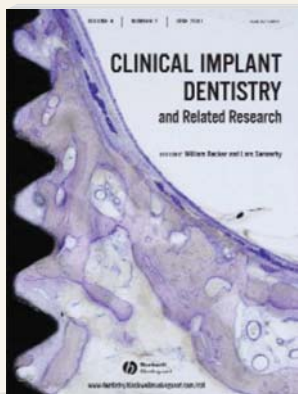
Published in:

**CLINICAL IMPLANT
DENTISTRY**
and Related Research

”

Reimplantation of Dental Implants
following Ligature-Induced
Peri-Implantitis: A Pilot Study in Dogs”*

Liran Levin, DMD¹; Hadar Zigdon, DMD¹; Paulo G. Coelho, DDS, PhD²;
Marcelo Suzuki, DDS³; Eli E. Machtei, DMD¹



* Liran Levin DMD, Hadar Zigdon DMD, Paulo G. Coelho DDS, PhD, Marcelo Suzuki DDS, Eli E. Machtei DMD Article first published online: 11 JUL 2011. DOI: 10.1111/j.1708-8208.2011.00371.x.

ABSTRACT.

Objectives

This preliminary investigation aimed to evaluate the potential of contaminated implants to reosseointegrate into pristine sites and, in addition, to assess the potential of osseointegration of new implants in peri-implantitis sockets in a canine model.

Methods

All mandibular premolars were bilaterally extracted from two mongrel dogs. Following 12 weeks of healing, two dental implants were inserted on each hemiarch. Forty-five days following implant placement, a silk ligature secured with cyanoacrylate was placed around the implants' cervical region in order to induce peri-implantitis. After another 45 days from ligature placement, the implants were mechanically removed using counter rotation with a ratchet and were reimplanted without any decontamination (neither rinsing nor chemical or mechanical cleaning) in adjacent pristine zones. In sites where implants were removed, new, wider-diameter implants were placed in the infected sockets. Forty-five days following reimplantation surgery, the dogs were sacrificed; nondecalcified specimens were processed and toluidine blue stained for morphologic and morphometric (bone-to-implant contact [BIC]) assessment under an optical microscope.

Results

In dog 1 all the implants (both in the pristine and in the infected sites) survived and osseointegrated while in dog 2, six out of eight implants failed to osseointegrate and exfoliated. Overall, the mean BIC of all implants was 51.08% (SD 20.54). The mean BIC for the infected implants placed into pristine sites was $51.48\% \pm 26.29\%$ (SD) and the mean BIC for the new implants in peri-implantitis socket was $50.58\% \pm 14.27\%$ (SD).

Conclusion

Within the limitations of this preliminary investigation, especially the small number of animals, osseointegration seems to be achievable both in infected sites and around contaminated implant surfaces.



Forty-five days from ligature placement, the implants were mechanically removed using counter rotation with a ratchet and were reimplanted (without any decontamination) in adjacent pristine zones (right implant). In sites where implants were removed, new, wider-diameter implants were placed in the peri-implantitis sockets (left implant).



Histologic section of a new implant placed in a peri-implantitis site. Note the high bone-to-implant contact area.

Authors' affiliations

¹ Department of Periodontology, School of Graduate Dentistry, Rambam Health Care Campus, Haifa, Israel; Faculty of Medicine, Technion – Israel Institute of Technology, Haifa, Israel

² Department of Biomaterials and Biomimetics, New York University, New York, NY, USA

³ Tufts University School of Dental Medicine, Boston, MA, USA

May
2012

Published in:

JOMI

”

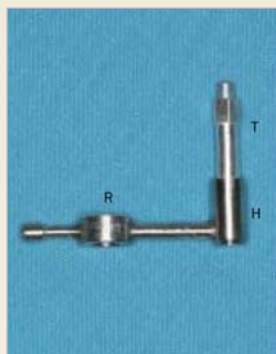
A Novel Device for Resonance Frequency Assessment of One-Piece Implants” *

Eran Gabay, DMD, PhD¹; Omer Cohen, DMD, PhD¹;
Eli E. Machtei, DMD²



* Eran Gabay, DMD, PhD; Omer Cohen, DMD, PhD; Eli E. Machtei, DMD. A Novel Device for Resonance Frequency Assessment of One-Piece Implants. The International Journal of Oral & Maxillofacial Implants. 2012, 27 (3): 523-527.

ABSTRACT.



The external fixation device is composed of an affixing ring (R) coupled to an internal-hex ring (H). The transducer (T) is mounted on the remote internal-hex ring.



The external fixation device is attached to a one-piece dental implant abutment via the affixing ring and screwed on tightly.

Purpose

Immediate loading and/or restoration of dental implants requires the assessment of implant stability, which is best preformed by resonance frequency analysis (RFA) prior to loading. One-piece dental implants are usually used for immediate loading, but there is currently no available reliable method to assess the primary stability of one-piece dental implants. Therefore, this study sought to validate a novel device designed for RFA measurements of one-piece implants.

Materials and Methods

Thirty (3.75 X 13mm) internal-hex implants (SEVEN, MIS) were divided into two groups; 15 were placed in the acrylic glass block and 15 were placed in fresh porcine jawbone using 30 N/cm² of insertion torque. Implant stability quotient (ISQ) values were measured using the Osstell mentor device; then, a new external fixation device was attached to the implant abutment with a 10-mm arm extending from the implant to an internal-hex ring at its proximal end. ISQ values were measured at the implant's internal hex and at the internal hex of the device, and the damping ratio was calculated. The measurements were repeated with 15 (3x13mm) one-piece implants (UNO, MIS) attached to the same device.

Results

The damping ratio between the implant and the proximal device was 23.6%±4% in acrylic glass (50.1 ± 1.7 ISQ and 38.2 ± 1.8 ISQ, respectively) and 2.31% ± 3% in porcine bone (74.9 ± 2.8 ISQ and 57.5 ± 0.5 ISQ, respectively). ISQ values determined by the device on one-piece and two-piece implants were similar (57.4 ± 0.9 and 57.5±0.5, respectively).

Conclusion

With the present validation of this external fixation device for the measurements of implant stability using RFA, it is now possible to measure primary stability of any one-piece implant system, obviating the need for custom-made Osstell adaptors.

Authors' affiliations

¹Postgraduate Student, Department of Periodontology, School of Graduate Dentistry, Rambam Health Care Campus, and Technion-Israel Institute of Technology, Faculty of Medicine, Haifa, Israel.

²Professor and Chair, Department of Periodontology, Head of School of Graduate Dentistry, Rambam Health Care Campus, and Technion-Israel Institute of Technology, Faculty of Medicine, Haifa, Israel.

June
2012

Published in:



(Quintessence International)

”

Bacterial and inflammatory behavior of implants in the early healing phase of chronic periodontitis”*

Raluca Cosgarea, DMD ^{1,2}; Bettina Dannewitz, DMD ²; Anton Sculean, DMD, MS, PhD ³; Simion Bran, DMD ⁴; Horatiu Rotaru, DMD ⁴; Grigore Baciut, DMD, PhD ⁴; Sigrun Eick, DMD, PhD ³



* Raluca Cosgarea, DMD; Bettina Dannewitz, DMD; Anton Sculean, DMD, MS, PhD; Simion Bran, DMD; Horatiu Rotaru, DMD; Grigore Baciut, DMD, PhD; Sigrun Eick, DMD, PhD. Bacterial and inflammatory behavior of implants in the early healing phase of chronic periodontitis. Quintessence International 2012, 44 (6): 491-501.

ABSTRACT.



Panoramic radiograph after implant insertion



GCF sampling with a paper strip at the implant site



Microbial sampling with a paper point at the implant

Authors' affiliations

¹Department of Prosthetic Dentistry, University of Medicine and Pharmacy, Cluj-Napoca, Romania.

²Department of Conservative Dentistry, Clinic for Oral, Dental and Maxillofacial Diseases, University of Heidelberg, Germany.

³Department of Periodontology, Dental School, University of Bern, Switzerland.

⁴Department of Cranio-Maxillofacial Surgery, University of Medicine and Pharmacy, Cluj-Napoca, Romania.

Objectives

To assess the pattern of early bacterial colonization at implants and teeth in patients with a history of chronic periodontitis compared with a group of healthy subjects. Furthermore, the presence of host-derived markers at teeth and implants in the two subject groups was determined.

Materials and methods

Subgingival and submucosal plaque and gingival crevicular fluid samples from 37 nonsubmerged healing dental implants and the deepest tooth sites per quadrant were analyzed 2 to 5 months after implant insertion. The presence of periodontal pathogens was assessed by means of real-time polymerase chain reaction. Further, the levels of interleukin (IL)-1 β , IL-8, and IL-10; secretory leukocyte protease inhibitor; and the neutrophil elastase activity were determined.

Results

Eleven patients with chronic periodontitis and 13 subjects without periodontitis were recruited for this study. Bacterial species associated with periodontitis were detectable at both the teeth and implants. The presence was always higher in the chronic periodontitis group; the difference was significant for *Porphyromonas gingivalis* and *Aggregatibacter actinomycetemcomitans* at both the implants and teeth. The levels of IL-1 β were higher at teeth than at implants; in contrast, more IL-10 was measured at the implants.

Conclusion

The present results indicate that (1) dental implants inserted in periodontally compromised patients are colonized with periodontal pathogens within the first weeks of healing; (2) inflammatory markers (IL-1 β) are present in higher levels at teeth as compared with implants, whereas at implants, anti-inflammatory cytokines (IL-10) might play the important role; and (3) the importance of periodontal treatment prior to implant insertion to reduce bacterial load and inflammation should be emphasized.

October
2011

Published in:

R J M E

”

Adjusting dento-alveolar morphology with orthodontic mini-implants (miniscrews). A clinical case report”*

Cristina Dana Bratu¹, R. V. Pop², Silvia-Izabella Pop³, Emanuel A. Bratu⁴



* Cristina Dana Bratu, R. V. Pop, Silvia-Izabella Pop, Emanuel A. Bratu. Adjusting dento-alveolar morphology with orthodontic mini-implants (miniscrews). A clinical case report. Rom J Morphol Embryol 2011, 52(3 Suppl):1133 – 1137.

ABSTRACT.

Objectives

The aim of this article is to present and discuss the clinical uses, benefits and drawbacks of the miniscrew implants used to reorder and adjust the dento-alveolar morphology of the overerupted maxillary molars.

Materials and Methods

Four machined orthodontic mini-implants (MIS– Israel) were inserted, under local anesthesia (Ultracain DS– ESPE), in D3 bone density (350–850 HU) (Misch classification) based on the number of Housfield units (HU). A minimal incision was performed in order to expose the bone. A single drill was used to penetrate the cortical bone and the implants were inserted under the correct angle using a hand driver. All implants had a good primary stability. The next phase was immediate loading with an elastic chain and after one month with a coil spring 150 g GAC, maintained by composite resin, and elastic chain.

Results

During seven months, an intrusion was obtained, with four orthodontic miniscrews, without full-arch appliances. Radiographically showed intact lamina dura around the first left superior molar and no root resorption and the final result can be observed.

Conclusion

The use of miniscrews is highly indicated as anchorage for the intrusion of maxillary molars. The patient was treated using mini-implants without fullarch technique, which offered a good esthetic alternative. Short-term molar intrusion and change of alveolar process morphology was achieved within a limited amount of time, without clinically detectable apical root resorption. No discomfort has been reported in our case. The machined mini-implants (MIS, Israel) used in the present article proved to be efficient in maintaining the type of extradental anchorage required in this clinical situation. None of the implants showed signs of osseointegration and could easily be removed from the bone.



The mini-implants loaded with elastic chain and a Ni–Ti close coil spring 150 g GAC, maintained by composite resin.

Authors' affiliations

¹Department of Pedodontics and Orthodontics, Faculty of Dentistry, "Victor Babeș" University of Medicine and Pharmacy, Timisoara.

² Private practice, Targu Mures.

³Department of Pedodontics and Orthodontics, Faculty of Dentistry, University of Medicine and Pharmacy of Targu Mures.

⁴Department of Implant Supported Restorations, Faculty of Dentistry, "Victor Babeș" University of Medicine and Pharmacy, Timisoara

September
2010

Published in:

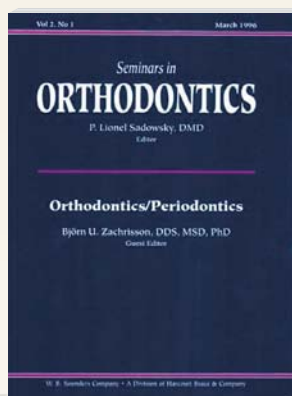
Seminars in

ORTHODONTICS

”

Skeletal Implant Anchorage in the Treatment of Impacted Teeth-A Review of the State of the Art”*

Stella Chaushu¹ and Gavriel Chaushu²



* Stella Chaushu, Gavriel Chaushu. Skeletal Implant Anchorage in the Treatment of Impacted Teeth-A Review of the State of the Art. *Seminars in Orthodontics*. 2010, 16(3): 234-241.

ABSTRACT.

The surgical-orthodontic approach is the most commonly used modality in patients with impacted teeth. It is also the most challenging. The prognosis of treatment is uncertain, treatment takes much longer and is more painful, and the enhanced biomechanical efforts required to bring the tooth to its ideal position frequently cause deleterious side effects to the remainder of the dentition. Skeletal anchorage is a useful aid in these cases. It can be judiciously exploited to assess the prognosis of canine movement, open adequate space for the canine, and build up a reliable anchorage unit that will allow the application of controlled directional forces with fewer side effects on the anchorage teeth. Treatment is facilitated and shortened because the resolution of the impaction may be performed separately before or even simultaneously with treatment of the remainder of the dentition, as 2 distinct force systems. The present article reviews some of the main indications for implant anchorage in treatment of impacted teeth. .



Use of skeletal anchorage to shorten duration of appliance wear. A more gingivally-placed miniscrew subsequently inserted to increase the range of force exerted by an elastic chain underneath the artificial esthetic pontic.

Authors' affiliations

¹Associate Professor and Head of Department of Orthodontics, Hebrew University-Hadassah School of Dental Medicine, Jerusalem, Israel.

²Associate Professor of Department of Oral and Maxillofacial Surgery, Maurice and Gabriela Goldschleger School of Dental Medicine, Tel-Aviv University, Tel-Aviv, Israel.

August
2009

Published in:

CLINICAL ORAL IMPLANTS RESEARCH

”

Behavior of two osteoblast-like
cell lines cultured on machined
or rough titanium surfaces”*

Lior Shapira, Amal Halabi



*Shapira L, Halabi A., Behavior of two osteoblast-like cell lines cultured on machined or rough titanium surfaces. Clin. Oral Impl. Res. 20, 2009; 50–55.

ABSTRACT.

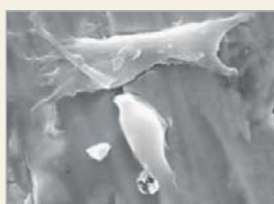
Scanning electron micrographs of MG63 and Saos-2 cells on rough and machined titanium surfaces. (magnification x 4000).



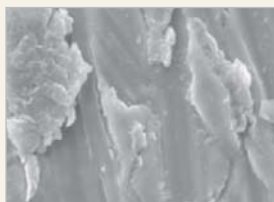
MG63 Rough



Saos-2 Rough



MG63 Machined



Saos-2 Machined

Background

Two osteosarcoma-derived cell lines have been extensively used to investigate the biological events occurring on titanium surfaces: MG63 and Saos-2. However, the behavior of the two lines on different titanium surfaces has never been compared.

Aim

The aim of the present study was to compare the behavior of MG63 and Saos-2 cells on two different titanium surfaces, machined and rough (sandblasting and acid-etched). We compared cell proliferation and morphology, alkaline phosphatase (ALP) activity and secretion of osteocalcin (OC).

Results

The most pronounced difference between the two cell lines was that ALP activity in the Saos-2 cells was 10-fold higher than in the MG63 cells. The proliferation rate of the MG63 cells was much higher than that of the Saos-2 cells at all the tested cell concentrations. MG-63 cells, but not Saos-2 cells, grown on rough surface titanium proliferated more rapidly than cells grown on machined surfaces. Morphological analysis revealed that Saos-2 cells and cells grown on the rougher surface, displayed a more mature phenotype. The level of OC secreted by the Saos-2 cells, but not the MG63 cells, were higher on the rough surface than on the machined surface.

Conclusion

This study shows that Saos-2 cells exhibit a more mature osteoblast phenotype, compared with that of MG63 cells, rendering them a good candidate for an in vitro model of osseointegration.

Authors' affiliations

Department of Periodontology, Faculty of Dental Medicine, Hadassah-Hebrew University Medical Center, Jerusalem, Israel

August
2012

Published in:

CLINICAL ORAL IMPLANTS RESEARCH

”

Thermal changes and drill wear
in bovine bone during implant
site preparation. A comparative in
vitro study: twisted stainless steel
and ceramic drills”*

Natália Oliveira¹, Fernando Alaejos-Algarra², Javier Mareque-Bueno²
Eduard Ferrés-Padró², Federico Hernández-Alfaro²



* Oliveira N, Alaejos-Algarra F, Mareque-Bueno J, Ferrés-Padró E, Hernández-Alfaro F. Thermal changes and drill wear in bovine bone during implant site preparation. A comparative in vitro study: twisted stainless steel and ceramic drills. Clin. Oral Impl. Res. 23, 2012, 963–969.

ABSTRACT.

Objectives

The purpose was to assess thermal changes and drill wear in bovine bone tissue with the use of twisted stainless steel and zirconia-based drills, during implant site preparation.

Methods

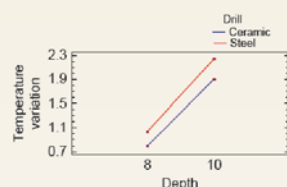
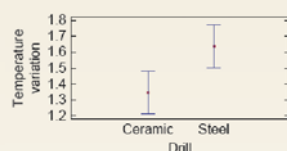
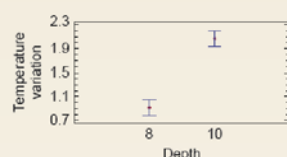
A total of 100 implant site preparations were performed on bovine ribs using a surgical unit linked to a testing device, in order to standardize/simulate implant drilling procedures. Bone temperature variations and drilling force were recorded when drilling at a depth of 8 and 10mm. A constant irrigation of 50 ml/min. (21 °C) and drilling speed of 800 r.p.m. were used. Scanning electron microscopy analysis was performed prior and after drilling.

Results

Mean temperature increase with both drills at 8mm was 0.91°C and at 10mm was 2.1°C (Po0.0001). Statistical significant higher bone temperatures were obtained with stainless steel drill (1.61°C), when comparing with the ceramic drill (1.31°C) (Po0.05). Temperature increase was correlated with higher number of perforations (Po0.05) and drilling load applied. There was no significant association between drilling force applied and temperature increase by either drill or at either depth. No severe signs of wear of either drill were detected after 50 uses.

Conclusions

Drill material and design, number of uses, depth and drilling load applied appear to influence bone temperature variations during implant site preparation. Drilling depth was a predominant factor in bone temperature increase. Both drills can be used up to 50 times without producing harmful temperatures to bone tissue or severe signs of wear and deformation.

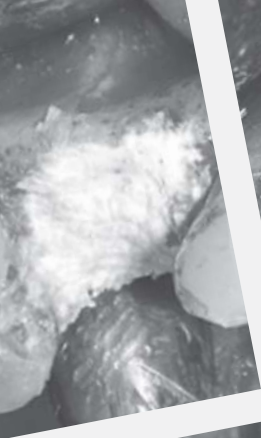


Mean temperature increase variations according to depth and drill used during implant site preparations.

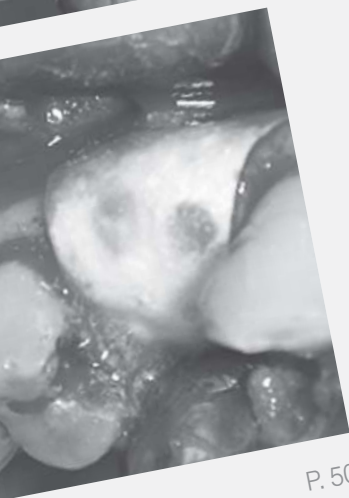
Authors' affiliations

¹International Program in Implant Dentistry, Surgery and Prosthodontics, Faculty of Dentistry, Universitat Internacional de Catalunya, Barcelona, Spain.

²Department of Oral Medicine, Oral and Maxillofacial Surgery and Implantology, Faculty of Dentistry, Universitat Internacional de Catalunya, Barcelona, Spain.



P. 50

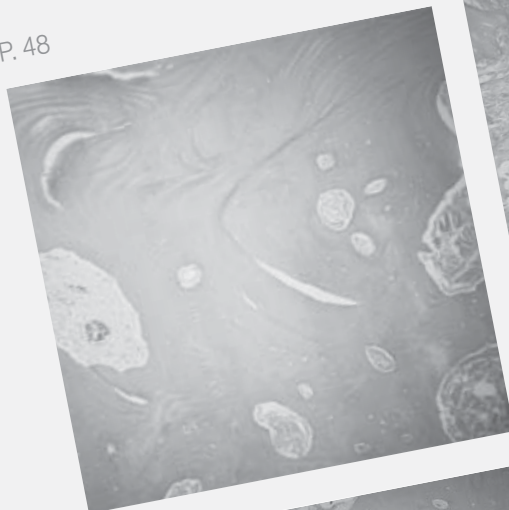


P. 50

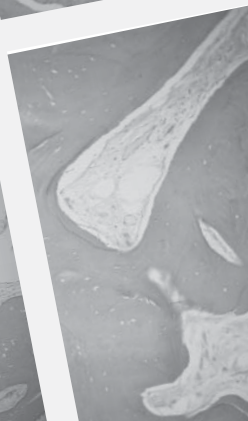
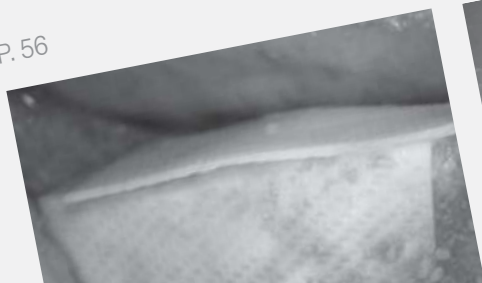
P. 52



P. 48



P. 56





Bone grafting

October
2011

Presented at:



”

Comparison of Bone Grafting Materials in Human Extraction Sockets: clinical, histologic and histomorphometric evaluations”*

I.G. Gisakis¹, D. Kalyvas¹, K. Tosios², V. Petsinis¹, K. Alexandridis¹



* Presented at the 20th Annual Scientific Meeting of the European Association of Osseointegration, 13-15 October 2011, Athens, Greece

ABSTRACT.

Histological observations



Allograft



Xenograft



Biphasic calcium sulfate



Control group

Authors' affiliations

¹Dept of Oral & Maxillofacial Surgery.

²Division of Basic Biomedical Sciences&Oral Biology, School of Dentistry, University of Athens, Athens, Greece.

Aim

The objectives of this 3-month randomized, controlled, clinical study were:

- 1) to compare the bone dimensional changes following tooth extraction alone versus extraction plus ridge preservation using 3 different grafting materials and a collagen membrane.
- 2) to analyze and compare histologic and histomorphometric aspects of the extraction-alone sites to the grafted sites.

Materials and Methods

32 adult patients (26 male, 6 female, aged 21-56 years, mean 37.6 years) requiring an extraction and delayed implant placement were randomly selected to receive either extraction alone (EXT, control group, 8 cases) or ridge preservation (RP) using:

- i) demineralised freeze-dried bone allograft (DFDBA, 8 cases),
- ii) deproteinized bovine bone mineral (DBBM, 8 cases)
- iii) biphasic calcium sulfate (BCS, 8 cases).

A collagen membrane was used in all cases.

A total of 32 biopsies were processed for histomorphometric evaluation of the mean percentage of bone, residual graft and connective tissue by area.

Results

The width of the RP group decreased from $9.2 \pm 1.2\text{mm}$ to $8.0 \pm 1.4\text{mm}$ ($p > 0.05$), while the width of the EXT group decreased from $9.1 \pm 1.0\text{mm}$ to $6.4 \pm 2.2\text{mm}$ ($p < 0.05$).

The biopsies from the grafted sites revealed formation and remodeling of trabecular bone, highly mineralized and well structured. New bone formation and connective tissues (CT) on and around graft particles was widespread. No inflammation was observed.

The histomorphometric analysis revealed an average of: a) DFDBA group: 58.7% vital bone (VB), 5.9% residual graft particles (RGP), and 35.4% CT, b) BBM group: 59.1% VB, 12.6% RGP, and 28.3% CT, c) BCS group: 61.3% VB, 4.1% RGP, and 34.6% CT, d) Control group: 70.1% VB and 29.9% CT.

Conclusions

Ridge preservation using bone graft and a collagen membrane significantly limited the resorption of hard tissue and improved ridge height and width dimensions when compared to extraction alone.

The quantity of bone observed on Histologic analysis was slightly lower in preservation sites, although these sites included both vital and non-vital bone.

Nevertheless, future controlled clinical trials with larger samples are needed to validate the findings of the current study.

May
2011



* Presented at:

MIS GLOBAL
CONFERENCE 2011

* Poster presented at MIS Global Conference, Cancun 2011

”

BONDBONE® in Post-extraction Sockets: Clinical Application and Histomorphometric Evaluation - Preliminary Results”*

I.G. Gissakis¹, D. Kalyvas¹, K. Tosios¹, V. Petsinis¹, K. Alexandridis¹,
D. Zabarass², S. Bouboulis², A. Spanos², A. Kountouri²



¹Dept of Oral & Maxillofacial Surgery, School of Dentistry, University of Athens, Greece.

²Dept of Dental Implants, Hygeia Hospital, Athens, Greece.

ABSTRACT.

Female patient, 42 years old - GBR in post-extraction socket with BONDBONE® and 4BONE RCM membrane and delayed implant placement.



Clinical status after tooth extraction



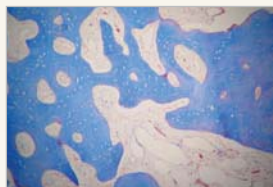
Application of BONDBONE®



Application of 4BONE RCM membrane



Clinical situation 3 months after surgery, at implant placement



Histologic picture

Aim

The aim of this research study is to evaluate the quantity and quality of regenerated bone in post extraction sockets with guided bone regeneration methods for delayed implant placement, by clinical, histologic and histomorphometric criteria.

Materials and Methods

32 adult patients, with no medical history, requiring an extraction and delayed implant placement were randomly selected to receive either extraction alone (EXT) or ridge preservation (RP). The patients were divided into four groups of 8 patients each. The materials used were: a) allograft with collagen resorbable membrane (4BONE RCM, MIS Implants Technologies Ltd, Bar Lev, Israel); b) xenograft with collagen resorbable membrane; c) synthetic bone graft (BONDBONE®, MIS Implants Technologies Ltd, Bar Lev, Israel) with collagen resorbable membrane (4BONE RCM); d) no graft materials (control group). After a healing period of 3 to 6 months, bone core biopsies were collected from the augmented sites, and the healed sites of the control group, at the time of implant placement, by a trephine bur.

Clinical findings

Adequate bone volume was clinically observed in all cases. The width of the RP group decreased from $9.2 \pm 1.2\text{mm}$ to $8.0 \pm 1.4\text{mm}$ ($p < 0.05$), while the width of the EXT group decreased from $9.1 \pm 1.0\text{mm}$ to $6.4 \pm 2.2\text{mm}$ ($p < 0.05$), a difference of 1.6 mm. Both the EXT and RP groups lost ridge width, although an improved result was obtained in the RP group. No important post-surgical complications were observed. Minor complications such as early wound exposure occurred in 3 cases. All implants were restored into function, with a survival rate at baseline of 100%.

Histologic evaluation

The biopsies harvested from the grafted sites revealed formation and remodeling of trabecular bone, which was highly mineralized and well structured. Particles of the grafted material could be identified in all samples. New bone formation and connective tissues (CT) on and around graft particles was widespread. No inflammation or fibrous encapsulation was observed. The bone formed in the control sites was also well structured with a minor percentage of mineralized bone.

Conclusion

Ridge preservation using BONDBONE and 4BONE RCM collagen membrane improved ridge height and width dimensions when compared to extraction alone. The quantity of bone observed on histologic analysis was slightly lower in preservation sites, although these sites included both vital and non-vital bone. Overall, no serious complication was seen during the healing period. In most patients marginal mucosa and bone levels remained stable following restoration. Implant success rate was 100%.

August
2012

Published in:

Journal of
**ORAL AND
MAXILLOFACIAL SURGERY**

”

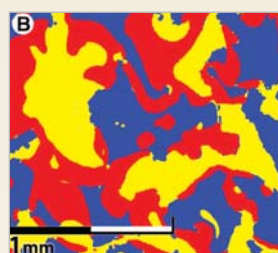
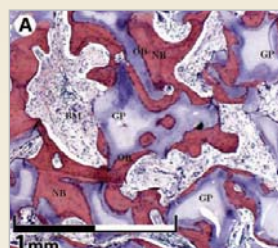
Histomorphometric Analysis of Maxillary Sinus Augmentation Using an Alloplast Bone Substitute”*

Roni Kolerman, DMD¹; Gal Goshen, DMD, MSc, MBA²; Nissan Joseph, DMD³;
Avital Kozlovsky, DMD⁴; Saphal Shetty, DMD⁵ and Haim Tal, DMD, PhD⁶



* Roni Kolerman, DMD, Gal Goshen, DMD, MSc, MBA, Nissan Joseph, DMD, Avital Kozlovsky, DMD, Saphal Shetty, DMD, Haim Tal, DMD, PhD. Histomorphometric Analysis of Maxillary Sinus Augmentation Using an Alloplast Bone Substitute. J Oral Maxillofac Surg 70:1835-1843, 2012

ABSTRACT.



A, A biopsy taken 9 months after grafting with 4Bone SBS. Graft particles (GP) are surrounded by vital newly formed bone (NB) and bone marrow (BM). Lining osteoblasts (OB) are clearly observed at the interface (hematoxylin and eosin stain; original magnification, 40).

B, Image processing of the biopsy in identifies new bone (red), graft particles (blue), and connective tissue (yellow).

Purpose

To evaluate the regenerative potential of a fully synthesized homogenous hydroxyapatite: β -tricalcium phosphate 60:40 alloplast material in sinus lift procedures.

Materials and methods

Hydroxyapatite: β -tricalcium phosphate was used for sinus floor augmentation. After 9 months, 12 biopsies were taken from 12 patients. Routine histologic processing was performed and specimens were analyzed using a light microscope and a digital camera.

Results

Histologic evaluation showed 26.4% newly formed bone, 27.3% residual graft material, and 46.3% bone marrow. The osteoconductive index was 33.5%.

Conclusion

Within the limits of the present study, it is suggested that 4Bone SBS is a biocompatible and osteoconductive graft permitting new bone formation similar to DBBM and allograft materials when used for sinus augmentation procedures.

Authors' affiliations

¹Instructor, Department of Periodontology, The Maurice and Gabriela Goldschleger School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel.

²Computerized Morphometry Laboratory, Hadassah-Hebrew University Medical Center, Jerusalem, Israel.

³Senior Lecturer, Department of Oral Rehabilitation, The Maurice and Gabriela Goldschleger School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel.

⁴Associate Professor, Department of Periodontology, The Maurice and Gabriela Goldschleger School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel.

⁵Private Practice, Implant Dentistry, Bangalore, India.

⁶Professor and Head, Department of Periodontology, The Maurice and Gabriela Goldschleger School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel.

June
2012

Published in:

Compendium

”

Enhancing Extraction Socket Therapy with a Biphasic Calcium Sulfate” *

Robert A. Horowitz, DDS¹; Michael D. Rohrer, DDS, MS²;
Hari S. Prasad, BS, MDT³; Nick Tovar, PhD⁴; and Ziv Mazor, DMD⁵



* Robert A. Horowitz, DDS; Michael D. Rohrer, DDS, MS; Hari S. Prasad, BS, MDT; Nick Tovar, PhD; and Ziv Mazor, DMD. Enhancing Extraction Socket Therapy with a Biphasic Calcium Sulfate. Compendium. June 2012; Volume 33, Number 6.

ABSTRACT.



Occlusal view of socket after atraumatic extraction of the involved tooth.



Biphasic calcium phosphate completely filled socket to within 1 mm of gingival margin.

Objectives

Studies have shown that tooth extraction results in loss of bone volume, which compromises dental implant placement. Prevention of site collapse at the time of extraction is recommended. In this 4-month case series, 40 patients were treated with an innovative biphasic calcium sulfate graft, demonstrating its ability to preserve or augment socket volume and resorb in the time period desired between extraction and implant placement. Some representative samples were retrieved at the time of implant placement and evaluated histologically and morphometrically for vital bone formation.

Materials and methods

A total of 60 teeth were extracted and grafted with BCS. Preoperative photographs and periapical radiographs were taken of the sites. In most cases, primary closure was not obtained over the graft material and barrier when placed. The graft material is packaged in a sterile syringe. BCS powder is wetted with sterile saline before being placed in the socket. Excess liquid was expressed into sterile gauze and the material was injected into the site. After the site was filled to ideal contour, dry gauze was applied and lightly compressed on top of the material. The working time was approximately 2 minutes. Patients were monitored for soft-tissue healing and radiographic evidence of graft resorption and bone formation for 3 to 5 months.

Conclusion

The biologic processes that leave the sites filled with vital bone in this timeframe have led to a 100% success rate in implant placement and loading. Additionally, this bone has maintained its integrity radiographically and enabled support of keratinized tissue with no dimensional alterations over the studied time period and well beyond (Figure 18). BondBone is simple and effective to use in treating extraction defects before dental implant placement, and is a viable material for socket augmentation.

Authors' affiliations

¹Departments of Periodontics and Implant Dentistry, Oral Surgery, New York University College of Dentistry, New York, New York; Private Practice, Periodontics and Implant Dentistry, Scarsdale and New York, New York

²Professor and Director, Division of Oral and Maxillofacial Pathology, Director, Hard Tissue Research Laboratory, University of Minnesota School of Dentistry, Minneapolis, Minnesota

³Senior Researcher, Department of Hard Tissue Research Laboratory, University of Minnesota School of Dentistry, Minneapolis, Minnesota

⁴Senior Researcher, Department of Biomaterials and Biomimetics, New York University College of Dentistry, New York, New York

⁵Private Practice, Periodontics and Implant Dentistry, Ra'anana, Israel

December
2009

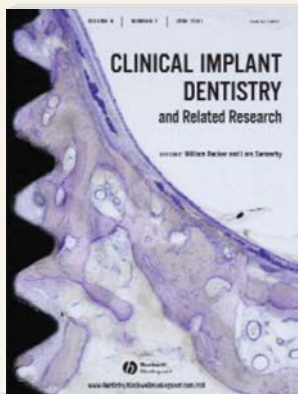
Published in:

**CLINICAL IMPLANT
DENTISTRY**
and Related Research

”

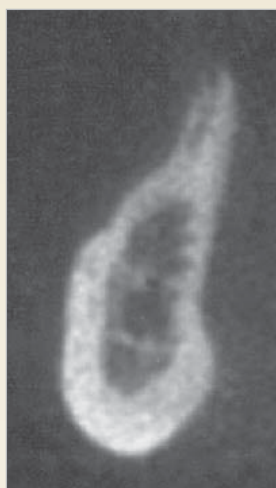
Efficacy of Cancellous Block
Allograft Augmentation Prior to
Implant Placement in the Posterior
Atrophic Mandible”*

Joseph Nissan, DMD¹; Oded Ghelfan, DMD²; Ofer Mardinger, DMD³;
Shlomo Calderon, DMD⁴; Gavriel Chaushu, DMD, MSc⁵



* Joseph Nissan, Oded Ghelfan, Ofer Mardinger, Shlomo Calderon and Gavriel Chaushu. Efficacy of Cancellous Block Allograft Augmentation Prior to Implant Placement in the Posterior Atrophic Mandible. Clinical Implant Dentistry and Related Research, Volume 13, Issue 4, Pages: 279–285,

ABSTRACT.



Preoperative computed tomography indicating relative narrow crestal bone.



Postoperative computed tomography after 6 months. Note bone thickness.

Background

The present study evaluated the outcome of ridge augmentation with cancellous freeze-dried block bone allografts in the posterior atrophic mandible followed by placement of dental implants.

Materials and Methods

A bony deficiency of at least 3 mm, horizontally, vertically, or both, according to computerized tomography (CT) para-axial reconstruction served as inclusion criteria. Implants were inserted after a healing period of 6 months. Bone measurements were taken prior to bone augmentation, during implant placement, and at second-stage surgery. Marginal bone loss and crown-to-implant ratio were also measured.

Results

Twenty-nine cancellous allogeneic bone blocks were placed in 21 patients. The mean follow-up was 37 months. Bone block survival rate was 79.3%. Mean horizontal and vertical bone gains were 5.6 and 4.3 mm, respectively. Mean buccal bone resorption was 0.5 mm at implant placement and 0.2 mm at second-stage surgery. A total of 85 implants were placed. Mean bone thickness buccal to the implant neck was 2.5 mm at implant placement and 2.3 mm at second-stage surgery. There was no evidence of vertical bone loss between implant placement and second-stage surgery. Implant survival rate was 95.3%. All patients received a fixed implant-supported prosthesis. At the last follow-up, the mean marginal bone loss was 0.5 mm. The mean crown-to-implant ratio was 0.96.

Conclusion

Implant placement in the posterior atrophic mandible following augmentation with cancellous freeze-dried bone block allografts may be regarded as a viable treatment alternative.

Authors' affiliations

¹Senior lecturer, ²instructor, Department of Oral Rehabilitation, The Maurice and Gabriela Goldschleger School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel;

³lecturer, ⁴professor, ⁵senior lecturer, Department of Oral and Maxillofacial Surgery, The Maurice and Gabriela Goldschleger School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel

January
2010

Published in:

JOMI

”

Use of Corticocancellous Allogeneic Bone Blocks for Augmentation of Alveolar Bone Defects”*

Michael Peleg, DMD¹; Yon Sawatari, DDS¹; Robert N. Marx, DDS¹;
Joseph Santoro, DDS¹; Jonathan Cohen, DDS¹; Pablo Bejarano, MD²;
Theodore Malinin, MD³.



* Michael Peleg, Yon Sawatari, Robert N. Marx, Joseph Santoro, Jonathan Cohen, Pablo Bejarano, Theodore Malinin. Use of Corticocancellous Allogeneic Bone Blocks for Augmentation of Alveolar Bone Defects. INT J ORAL MAXILLOFAC IMPLANTS 2010, 25:153-162

ABSTRACT.

Purpose

The use of autogenous block bone grafts in bone regeneration procedures for alveolar ridge augmentation can be limited by donor site morbidity and complications. The purpose of the present study was to evaluate the efficacy of allogeneic corticocancellous iliac block grafts used for ridge augmentation prior to implant placement.

Materials and methods

Forty-one patients with severe ridge volume deficiency underwent augmentation using allogeneic corticocancellous iliac block bone grafts. After rigid fixation of the graft, the site was covered with a freeze dried allogeneic dura mater membrane, and the wound was closed with tension free suturing. Implants were placed 3 to 4 months after surgery. Three to 6 months after implant placement, panoramic radiographs were taken and implants were uncovered for prosthetic restoration.



Rigid fixation of the bone blocks.



Vertical ridge augmentation and rigid fixation for graft stabilization.

Results

Of the 57 grafts placed, one showed 2.5 mm of resorption at the superior buccal aspect of the graft. No other clinical problems were observed. The block grafts were clinically well integrated into the recipient sites and the augmented bone remained stable throughout the implant placement procedures. Of the 84 implants placed, only one failed to integrate.

Conclusion

These results demonstrate that the use of allogeneic corticocancellous iliac block bone grafts in conjunction with guided bone regeneration principles is a viable alternative to autogenous grafts in selected patients with alveolar ridge deficiencies.

Authors' affiliations









¹Associate Professor of Surgery, Division of Oral and Maxillofacial Surgery, Department of surgery, University of Miami, Miller School of Medicine, Miami, Florida.

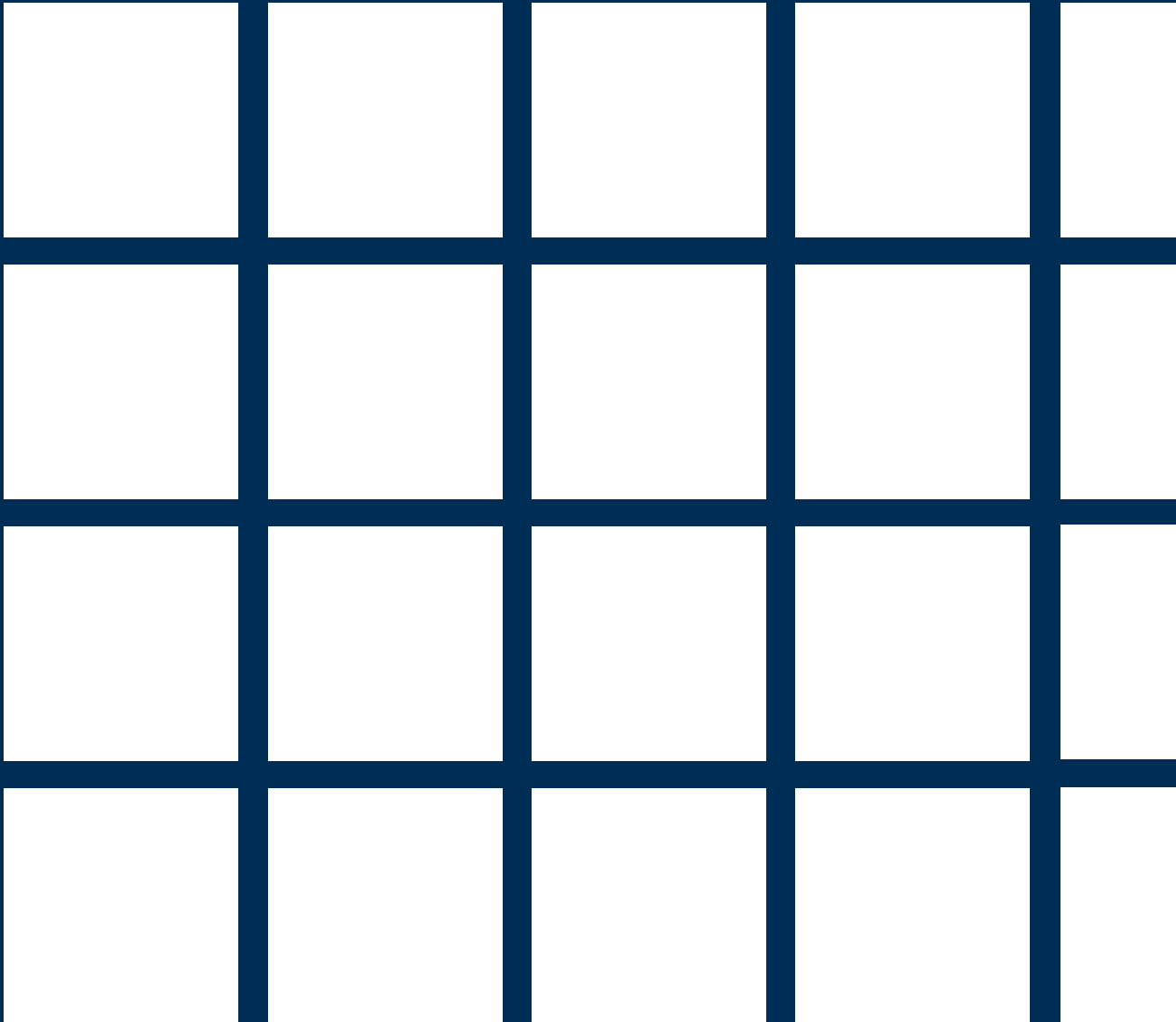
²Associate Professor of Surgery, Department of Pathology, University of Miami, Miller School of Medicine, Miami, Florida.

³Associate Professor of Surgery, Department of Orthopedics, University of Miami, Miller School of Medicine, Miami, Florida.

Summary.

P.8		Neck Design, Microthreads	Significantly less bone loss around implants' necks with microthreads.
P.10		Thread Design	Significantly higher ISQ value for SEVEN® implants, laboratory model.
P.12		5 years Prospective study, Large Population	7,340 SEVEN® implants with 99.71% Osseointegration rate. Survival rate after loading was 99.75%.
P.14		Retrospective, Multicenter	294 SEVEN® implants with 97.3% success rate. Mean marginal bone loss of 0.33mm after one year of functional loading.
P.16		Immediate Loading	110 Implants (SEVEN® & Mistral) with 99% survival rate and marginal bone loss similar to conventional protocols.
P.18			100% survival rate for 70 immediately loaded SEVEN® Implants, 25 implants with immediate placement, ISQ average value of 71 at the time of implant restoration (2012).
P.20			100% survival rate for 70 immediately loaded SEVEN® Implants, 25 implants with immediate placement, ISQ average value of 71 at the time of implant restoration (2011).
P.28		Peri-Implantitis	Osseointegration of wider diameter implants (SEVEN®) re-implanted in infected sockets.
P.30		One-Piece implants	ISQ values of One-Piece (UNO implant) & Two-piece (SEVEN® implant) were similar in porcine bone.

P.32		Inflammatory behavior of Implants	Inflammatory markers are present in higher levels at teeth as compared with implants (SEVEN®) in patients with chronic periodontitis.
P.34		Orthodontic Mini-Implants	The orthodontic mini-implants (LINK) were proven to be efficient in maintaining the extradental anchorage.
P.38		Surface, In -Vitro	Cells grown a rough surface proliferated more rapidly and secreted higher level of osteocalcin than on a machined surface.
P.44		Bone grafting materials in extraction sockets	Ridge preservation using BONDBONE® and collagen membrane significantly limited the resorption of hard tissue when compared with extraction only.
P.46		BONDBONE® in post-extraction sockets	BONDBONE® and 4BONE RCM Collagen membrane improved ridge height and width dimensions. Implant success rate was 100%.
P.48		Alloplast Bone Substitute	Histologic evaluation of 4BONE SBS showed 26.4% newly formed bone, 27.3% residual graft material, and 46.3% bone marrow. The osteoconductive index was 33.5%.
P.50		Extraction socket therapy with BONDBONE®	BONDBONE® is an effective material for socket preservation.
P.52		Implant placement following block allograft augmentation	85 implants were placed with survival rate of 95.3%. Mean marginal bone loss of 0.5mm.
P.54			84 implants were placed with survival rate of 98.8%.





mis

All rights reserved. No part of this publication may be reproduced, transcribed, stored in an electronic retrieval system, translated into any language or computer language, or be transmitted in any form whatsoever, without the prior written consent of the publisher.

MIS's Quality System complies with international quality standards: ISO 13485:2003 - Quality Management System for Medical Devices, ISO 9001:2008 - Quality Management System and CE Directive for Medical Devices 93/42/EEC. MIS's products are cleared for marketing in the USA and CE approved.

© MIS Corporation. All rights reserved.



MIS Implants Technologies Ltd.
www.mis-implants.com