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Volume 6.

Scientific studies

MAKE IT SIMPLE

MIS is proud of our collaboration with researchers and clinicians from around the world in the pursuit of new knowledge. We ask hard questions and revisit commonly accepted perceptions and concepts in our efforts to simplify implant dentistry. This volume presents a collection of studies conducted within the past few years, aiming to better understand procedures, materials and products. A number of these scientific works were presented at the 2nd MIS Global Conference in Cannes, France, in June 2013.

Dear friends and colleagues,

In June, 2013, MIS held its 2nd Global Conference in Cannes, France. This was a great opportunity for researchers and clinicians to share their work, knowledge and experience with a large audience of dentists from over 50 countries.

Implant dentistry is an evolving field. As time passes, through trials and experience, we have come to the realization that many previously well-established concepts have been proved false, while other previously unaccepted concepts have been found to be viable.

A few paradigm shifts in implant dentistry have taken place in the past few decades: We no longer wait 3 months for osseointegration to occur in the mandible or 6 months in the maxilla. Immediate placement and loading of implants has become routine, with more and more dentists and their patients benefiting from the results of such updated research.

As a global implant company, MIS collaborates with researchers and clinicians in over 25 countries. We are proud to be a part of this vibrant and active scientific community; gathering data and sharing ideas. Publication of articles in peer reviewed journals, discussion, inquiry and direct dialog with peers and colleagues allow each of us to examine our work from different perspectives. All, in an attempt to validate methodology, results and conclusions for the benefit of dentists and patients alike.

This collection consists of both published materials and presentation posters as yet unpublished; allowing us to share the most up-to-date clinical and scientific work from around the world. The work presented here, each in its own way, increases our knowledge and helps ensure that our products, suggested protocols and materials are safe and successful. On behalf of MIS, I wish to thank all contributor's for their valuable work.

Yours,

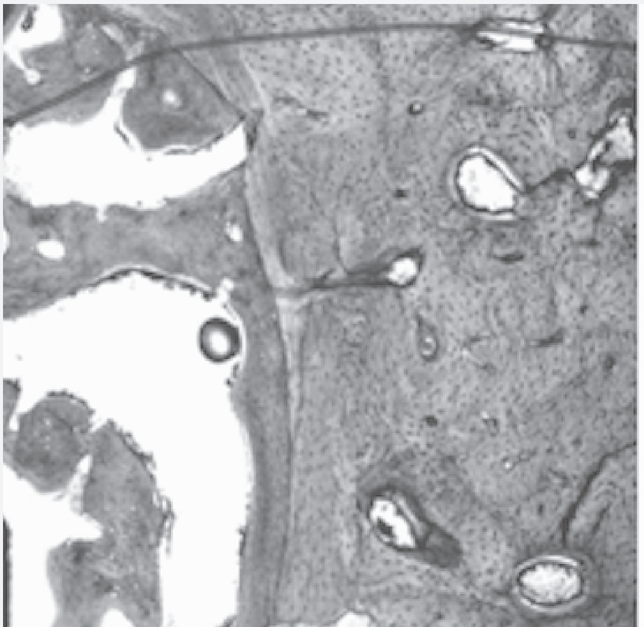
Dr. Nachum Samet
V.P Research

Index.

1

Simplified drilling technique does not decrease dental implant osseointegration: A preliminary report.

*A poster presented at the MIS Global Conference, Cannes 2013.



Simplified drilling technique does not decrease dental implant osseointegration: a preliminary report.

Ryo Jimbo[1], Gabriela Giro[2], Charles Marin[3], Rodrigo Granato[3], Marcelo Suzuki[4], Nick Tovar[2], Thomas Lilin[5], Malvin Janal[6], Paulo G. Coelho[2]

Background

Since the literature concerning the effects of drilling sequence and technique in osseointegration is sparse and contradictory, the present study hypothesized that implants placed in osteotomy sites with reduced drilling steps (pilot drill, and final drill), would present comparable biologic outcomes (i.e., histology and histomorphometry) relative to the conventional drilling protocols, provided that thorough irrigation prevented overheat in the bone.

Materials and methods

Seventy-two implants (diameter 3.75 mm and diameter 4.2 mm, n=36 for each diameter) were bilaterally placed in the tibia of 18 beagles for 1, 3, and 5 weeks. Half of the implants of each diameter were placed using a simplified drilling procedure (pilot and final drill) and the other half were placed using a conventional drilling procedure (all drills in sequence). After a period of 1, 3, and 5 weeks, the animals were sacrificed by an anesthesia overdose (n=6 per each time point) and the implant and the bone were removed en bloc. Measurements of the percentages of bone to implant contact (BIC) and bone area fraction occupancy (BAFO) between threads were performed throughout the perimeter of the implant at ×100 magnification with an optical microscope by using image analyzer software.

Results

Histology showed that new bone formed around the implant and inflammation or bone resorption was not evident for both groups. Histomorphometrically, the simplified group presented significantly higher bone-to-implant contact and bone area fraction occupancy as compared to the conventional group after 1 week, however, no differences were detected at 3 and 5 weeks.

Conclusions

In conclusion, the present study hypothesized that there would be no differences in osseointegration when reducing the number of drills for osteotomy compared to the conventional drilling protocols. Since significantly higher BIC and BAFO were observed for the simplified drilling technique at 1 week in vivo, the hypothesis was refuted.

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Implant Diameter		Pilot Drill (Ø 2.4)	Intermediate Drill (Ø 3.0)	Final Drill* (Ø 3.6)
Ø 3.75	Conventional	•	•	•
	simplified	•		•

Implant Diameter		Pilot Drill (Ø 2.4)	Intermediate Drill (Ø 3.0)	Intermediate Drill (Ø 3.5)	Final Drill* (Ø 4.0)
Ø 4.2	Conventional	•	•	•	•
	simplified	•			•

* Tapered Drills

Fig. 1 Description of the drilling protocol used for the study for both implant diameters.

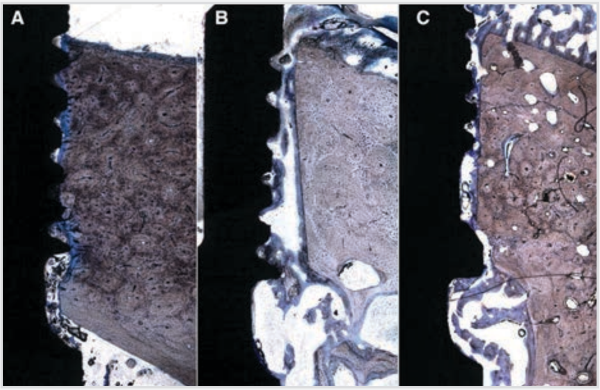


Fig. 2 Descriptive histologic images from the current study, where no histomorphologic differences were observed between groups at 1, 3 and 5 weeks in vivo. (A) 1 week, (B) 3 weeks, (C) 5 weeks. No notable differences were observed between implants placed using either one of the drilling protocols. No signs of inflammation or bone resporption were evident (merged image, original magnification ×20).

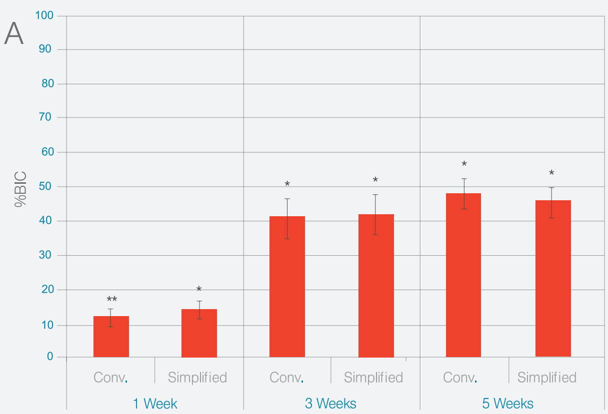


Fig. 3A Bone-to-implant contact (BIC, mean ± 95% CI) as a function of drilling technique and healing time.

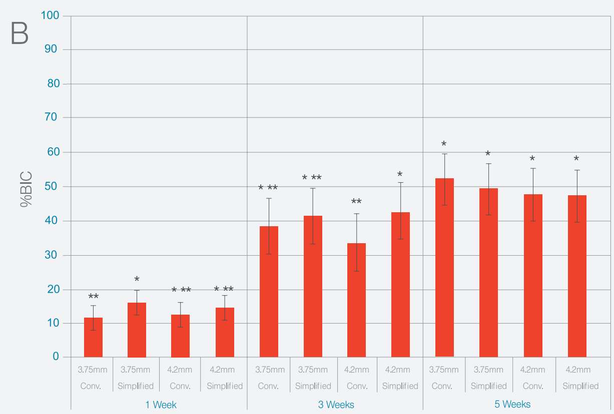


Fig. 3B BIC (mean ± 95% CI) as a function of drilling technique, healing time, and implant diameter. The number of asterisks represent statistically homogeneous groups.

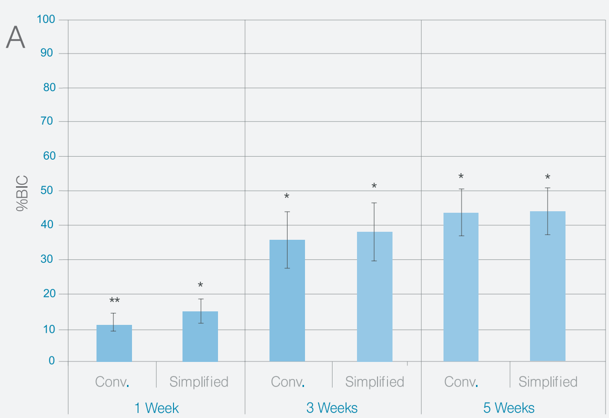


Fig. 4A Bone area fraction occupancy (BAFO, mean ± 95% CI) as a function of drilling technique and healing time.

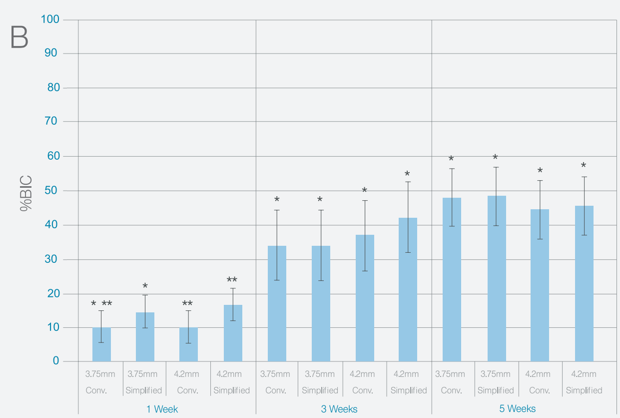
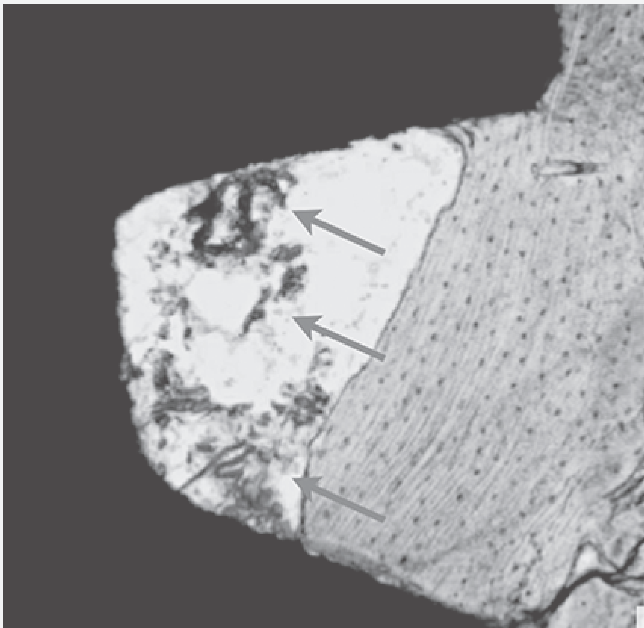


Fig. 4B BAFO (mean ± 95% CI) as a function of drilling technique, healing time and implant diameter. The number of asterisks represent statistically homogeneous groups.



2

The effect of simplifying dental implant drilling sequence on osseointegration. An experimental study in dogs.

*A poster presented at the MIS Global Conference, Cannes 2013.

The effect of simplifying dental implant drilling sequence on osseointegration. An experimental study in dogs.

Gabriela Giro, PhD[1], Nick Tovar PhD[1], Charles Marin PhD[2], Estevam A. Bonfante PhD[2], Ryo Jimbo PhD[3], Marcelo Suzuki DDS[4], Malvin N Janal PhD[5], Paulo G. Coelho PhD[1,6]

Background

Even though there are studies investigating the effect of different drilling protocols on osseointegration, little or no data is available regarding the rate in which the drilling site diameter is incrementally increased prior to implant placement, as anecdotally, this procedure has been performed in an incremental drill diameter fashion in an attempt to minimize bone damage during its instrumentation. It is a fact that there is no evidence in the literature whatsoever on the optimal drilling protocol that would result in successful osseointegration in clinical reality. At times, there are drilling protocols that require so many time consuming steps. It is of great interest to investigate if reducing the number of drills used would provide comparable results to the conventional drilling sequence. Thus, this study tested the hypothesis that no difference in implant osseointegration occurs by reducing the number of drills used for site preparation (pilot drill + final diameter drill) relative to the conventional incremental site preparation.

Methods

Seventy-two implants were bilaterally placed in the tibia of 18 beagle dogs and remained for 1, 3, and 5 weeks. Thirty-six implants were 3.75 mm in diameter and the other 36 were 4.2mm. Half of the implants of each diameter were placed under a simplified technique (pilot drill + final diameter drill) and the other half were placed under conventional drilling where multiple drills of increasing diameter were utilized. After euthanisation, the bone-implant samples were nondecalcified cut and grind sectioned and referred to histological analysis. Bone-to-implant contact (BIC) and bone-area-fraction-occupancy (BAFO) were assessed. Statistical analyses were performed by GLM ANOVA at 95% level of significance considering implant diameter, time in vivo and drilling procedure as independent variables, and BIC and BAFO as the dependent variable.

Results

Both techniques led to implant integration. No differences in BIC and BAFO were observed between drilling procedures as time elapsed in vivo. Bone healing around implants was uneventful following implant placement for all 72 sites. No signs of inflammation or infection were observed during the experimental period. In general, the histologic evaluation showed that at 1 week, initial woven bone formation occurred in the regions between threads and in direct contact with the implant surface (Figure 4A). At three weeks (Figure 4B), an increase in the amounts of bone between threads was evident, and ongoing replacement of woven bone by lamellar bone was observed for all groups evaluated at 5 weeks (Figure 4C).

Conclusion

The results of this study strongly suggest that the osteotomy preparation may be simplified and be less time consuming, however, constant irrigation will always be necessary to avoid the deleterious effect of temperature elevation in the bone, especially in high density bone, such as the mandibular anterior region. Lastly, a precise drilling orientation is required in the first drills, as in other techniques, but with fewer opportunities for angulation corrections, which may demand a steeper learning curve for the less experienced professional. The simplified drilling protocol presented comparable osseointegration outcomes to the conventional protocol, which proved the initial hypothesis.

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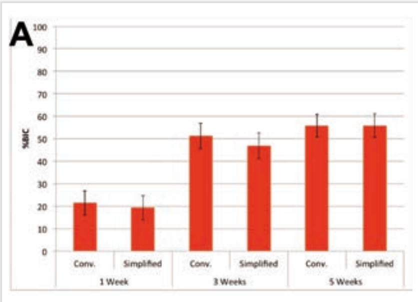


Fig. 1A Results for bone-to-implant (BIC) (mean ± 95% CI) as a function of drilling technique and time in vivo where no significant differences were observed between groups for each time point in vivo.

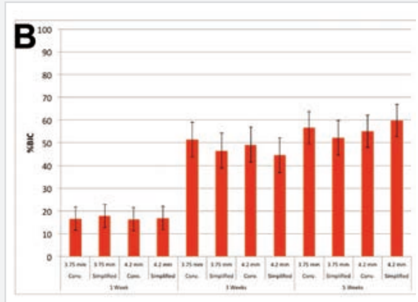


Fig. 1B Results for BIC (mean ± 95% CI) as a function of drilling technique, time in vivo, and implant diameter. No significant differences were observed between groups for each time point in vivo.

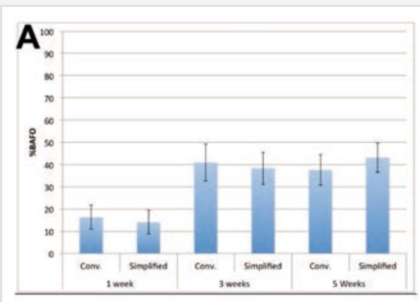


Fig. 2A Results for bone area fraction occupancy (BAFO) (mean ± 95% CI) as a function of drilling technique and time in vivo where no significant differences were observed between groups for each time point in vivo.

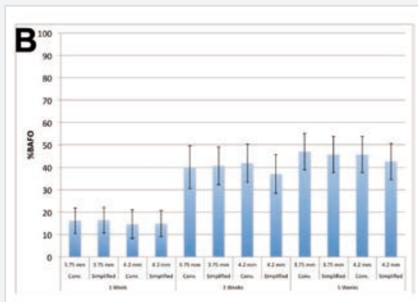


Fig. 2B Results for BAFO (mean ± 95% CI as a function of drilling technique, time in vivo, and implant diameter. No significant differences were observed between groups for each time point in vivo.

Fig. 3 No morphologic differences were observed between implants placed with either conventional or simplified techniques. The evaluation of the histologic sections at all time points showed direct contact between implant and bone in cortical and trabecular regions, as showed in this section of a 4.2mm diameter implant at 5 weeks of healing.

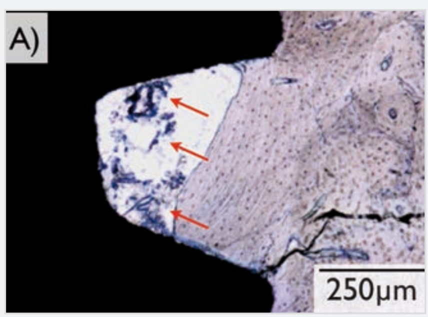


Fig. 4A Histologic evaluation showed that at 1 week, initial woven bone formation occurred in the regions between threads and in direct contact with the implant surface (arrows).

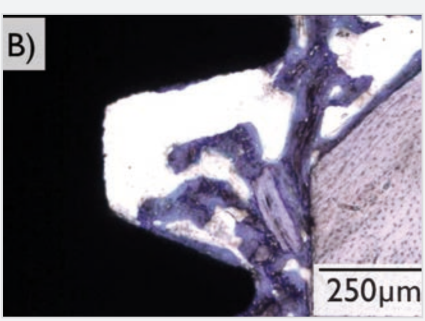


Fig. 4B At 3 weeks, an increase in the amounts of bone between threads was evident.

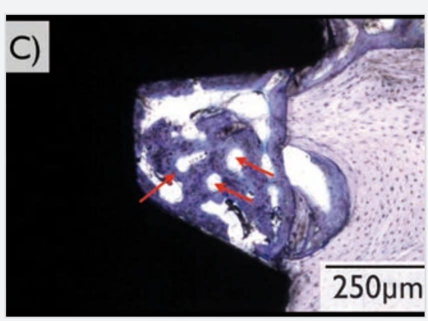
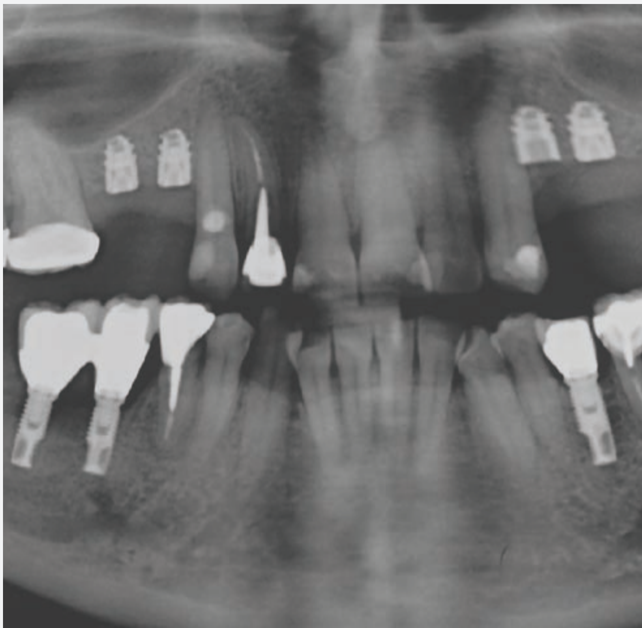


Fig. 4C Onset of replacement of woven bone by lamellar bone was observed for all groups evaluated at 5 weeks (arrows).



3

Performance of SEVEN® short implants subjected to disocclusion as determined by tomographic analysis: primary report.

*A poster presented at the MIS Global Conference, Cannes 2013.

Performance of SEVEN® short implants subjected to disocclusion as determined by tomographic analysis: primary report.

Jorge Luis García[1], Hugo M. Dagum[2], Silvana A. Díaz
Roberto Hormazabal[3]

Introduction

The common use of implantology in our daily odontological clinical practice is a trend that is here to stay[1-2]. The original idea that the loss of 1mm of bone during the first year is an acceptable physiological condition has been modified by technological advances. These advances have emphasized the development of different implant designs and surfaces to overcome such loss. These same advances have imposed the idea that long implants are not necessarily required in the process of oseointegration and that length itself has no direct relationship with teeth.[3]

In recent years, surgical disciplines have focused on developing minimally invasive techniques. Short implants offer advantages for those techniques, and they can also be used in situations with anatomical restrictions for the use of conventional implants.[4-5]

Numerous studies have shown a relationship between initial bone loss and its progress that jeopardizes oseointegration, and parafunctions such as bruxism or teeth clenching. New technologies for the treatment of these surfaces help to rectify these conditions, and new designs of the implant neck contribute to a better force distribution and prevent marginal bone loss. The aim of this research is to demonstrate, using tomographic analysis, that short implants, brand SEVEN® from the MIS Implants Technologies Ltd., subjected to disocclusion throughout time can preserve crestal bone integrity.

Materials and methods

Fifteen patients diagnosed with partially edentulous conditions of Kennedy Class I or II were selected. These patients were missing left and right upper premolars, with or without posterior pillars. They presented bone type 2 or 3 according to Zarb's classification, and bone type A according to Judy's classification (fig.1).

Each patient received at least two SEVEN® short implants with a diameter of 4.2mm and a length of 6mm. The patients that did not have pillars behind the edentulous area, received a third implant or a shortened arch was kept. The design of SEVEN® implants makes them compatible with a wide range of bone tissue, and they can be used in surgical procedures for tissue augmentation (fig.2).

The implants have dual threads of 2.40mm that speeds up drilling. Their three spiral channels promote integration. The microrings of 0.1x 0.3mm at the implant neck improves the distribution of forces at the crestal level.[6] Mucoperiosteal incisions, with palatalization tendency, were used in order to completely cover implant heads and maintain sutures at an appropriate distance. Bone tissue grinding followed standard protocol. Implants were

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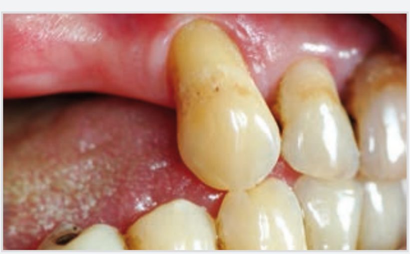


Fig. 1

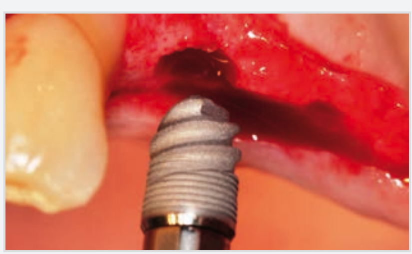


Fig. 2


Fig. 3


Fig. 4


Fig. 5


Fig. 6

positioned in direct relation to the canine, and were separated 2mm to ease restoration of the interdental papilla (fig.3). The second implant was placed 7mm away from the former, following the technique suggested by several authors. The implants were submerged to the limit established by the thickness of the first stage abutment. After 60 days of healing, the healing abutments were placed. Once tissues were healed, different height mesostructures type MULTI-UNIT (MA-S1375) were placed, leveling the emergent parts (fig.4). Splints of transfer copies were used and individual perforated impression trays were assembled. All models were cast in Densita type IV (fig.5). The resulting casts were mounted in semi-adaptable articulators, and ceramometal crowns, screwed and linked, were used in the prosthetic restorations.

Protocols were designed to evaluate occlusion in each patient and the active participation in disocclusion of each implant (fig.6). Evaluation was performed mainly through tomographic and radiographic observations immediately following installation, followed by three later control scans (fig.7). All patients had cone beam tomography scans[7] at 0, 6 and 12 months. The 18-month control scans have not yet been carried out. The tomography scanner was a 3D Accuitomo 170, J. Morita Mfg. Corp., Kyoto, Japan. (Exposure time: 17 seconds; kV:90; mA:10). The selected field of view for each patient was 40mm x 40mm, with a voxel of 0.08mm (80 microns).

Results

The behavior of SEVEN® implants was excellent in all patients. Only one implant was lost due to lack of Osseointegration. After the 60-day healing period (randomly chosen and applied to all patients), the second surgery took place and impressions were taken 30 days later, a period also randomly determined. Implants were positioned to receive MULTI-UNIT screwed prosthetic devices. All prosthetic devices were designed to have a role in disocclusion along with the canine. To date, the project has not demonstrated substantial changes in the 6- and 12-month controls, in either clinical or radiographic terms, in any of the 15 cases.

There were no signs of complications or lack of passivity. There was no loosening of prosthetic screws, and at the point of clinical examination, none of them required tightening, despite the fact that they were manually tightened, without using a torque wrench. For tomographic analysis, sagittal, coronal and axial sections with 0.5 mm thickness were obtained. Where the beam-hardening artifact[8] had more intensity, the thickness was increased to 1mm. This image defect consists of the generation of radiolucent shadows around metallic objects, which grow proportionally to the number of objects (fig.9).

Conclusions

There is no doubt that the use of an advanced technology in the make-up and design of dental implants that allow adequate force distribution helps to avoid bone loss at the crestal level.[9-10] In favorable conditions, modern design and technology can determine a change in the selection of implant length.[11-12] Short implants should not be discarded from general treatment plans, since they can obtain equal results, with minimal bone trauma, providing there is appropriate width. In the posterior maxillary area, where width is generous and there is not much height, short implants can compete with surgical techniques for bone regeneration. In all cases (30 implants / 15 patients), images have shown that there were no significant changes in surrounding bone tissue, at all levels (mesiodistal, buccolingual and sinus-crestal) in all controls (0, 6 and 12 months) (fig.10-11).

References

1-Branemark PI, Adell R, Breine U, Hansson BO, Lindstrom J, Ohlsson A. Intra-osseous anchorage of dental prostheses. I. Experimental studies. Scand J Plast Surg 1969; 3: 81-100 2-Smith D, Zarb G. Criteria for success of osseointegrated endosseous implants. J Prosthet Dent 1989;62:567-575. 3-Allbrektsson T, Branemark PI, Hansson HA, Lindstron J. Osseintegrated titanium implants. Requiremens for ensuring a long-lasting, direct bone-to-implant anchorage in man. Acta O RTHOP Scand 1981;52-155. 4-das Neves F D, Fones D, Rocha Bernardes S, do Prado C J, Fernandez Neto A J. Short implants-An analysis of longitudinal studies. Int. J Oral Maxillofacial implant 2006;21:86-93. 5-Friberg B, Grondahl K, Lekholm U, Branemark P-I. Long-term follow-up of several atrophic edentulous mandibles reconstructed with short Branemark implants. Clin Implant Dent Relat Res 2000;2:184-189. 6-Herman JS, Schoolfield JD, Schenk RK, Buser D, Cochran D. Influence of the size of the microgap on crestal bone changes around titanium implants. A histometric evaluation of unloaded non-submerged implants in tha canine mandible. J Periodontol 2001;72:1372-1383. 7- Arai, Y.; Honda, K.; Iwai, K.; Shinoda, K. (1998): Development of ortho cubic super high resolution CT. CARS, Computer Assisted Radiology and Surgery. Amsterdam, Elsevier. 1998 : 780-785. 8- Schulze R, Heil U, Gross D, Bruellmann DD, Dranischnikow E, Schwanecke U, Schoemer E. Artefacts in CBCT: a review.Dentomaxillofac Radiol. 2011 Jul;40(5):265-73. doi: 10.1259/dmfr/30642039. 9-Schwarz F, Herten M, Bieling K, Becker J. Cretal bone changes at nonsubmergede implants (camlog) with different machined collar lengths: A histomorphometric pilot study in dogs. Int J Oral Maxillofac Implants 2008;23:335-342. 10-Jung YU, Han CH, Lee KW. A 1-year radiographic evaluation of marginal bone around dental implants. Int J Oral Maxillofac Implants 1996;11:811-818. 11-Linkow LI, Cherchéve R. Theories and techniques of oral implantology. St Louis, MO: Mosby, 1970. 12-London RM, RobertsFA, Baker DA, r ohrer MD, O" Neal RB.Histologic comparision of a thermal dual – etched implant surface to machined, TPS, and HA surface:Bone contact in vivo in rabbits. Int J Oral Maxilofac Implants 2002;17 : 369-376

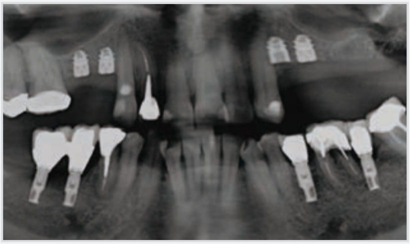


Fig. 7


Fig. 8

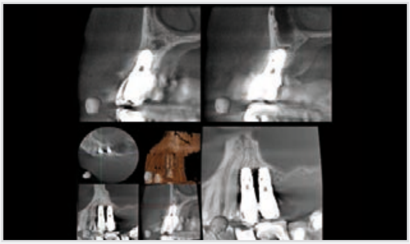


Fig. 9 Control 0 m 2.4 ,2.5 sagittal, coronal and axial sections.

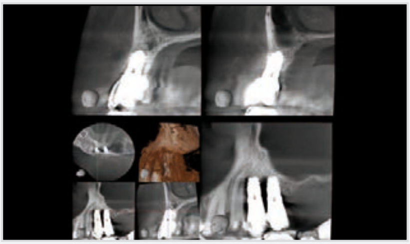


Fig. 10 Control 6 m 2.4 ,2.5 sagittal, coronal and axial sections.

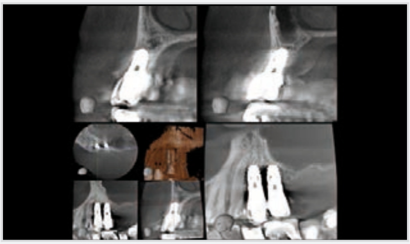
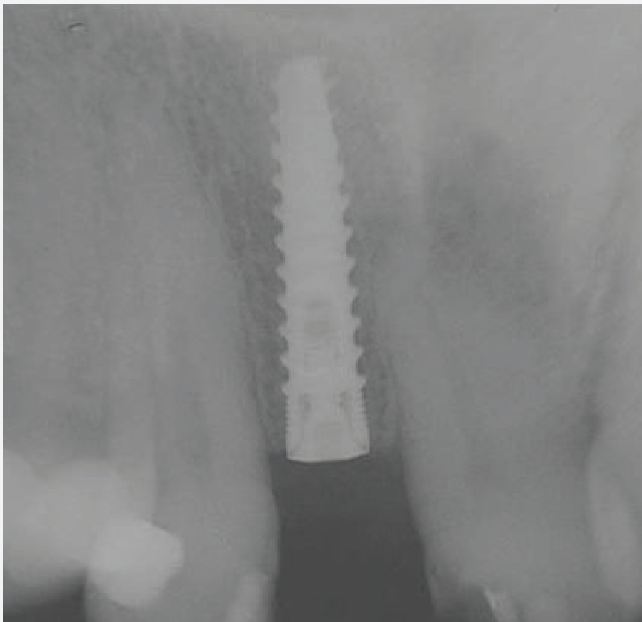


Fig. 11 Control 12 m 2.4 ,2.5 sagittal, coronal and axial sections.



4

Implant placement in the aesthetic zone. A clinical approach.

*A poster presented at the MIS Global Conference, Cannes 2013.

Implant placement in the aesthetic zone. A clinical approach.

Skiada Eirini, Kyriakaki Ioanna, Kouboura Ioanna, Zabara Eirini, Gisakis Ioannis *

Introduction

Implant therapy has become a reliable and predictable treatment alternative for the replacement of missing teeth. Especially, in the anterior maxilla true progress has been made when considering the quality of outcome from both the functional and aesthetic perspectives. When diagnosis and patient assessment dictates, implants can provide for improved and successful outcomes in this area (Morton et al 2004).

Thoroughly analyzing the anatomic situation and well-planned treatment has become a requirement, because incorrectly planned and positioned implants may jeopardize long-term esthetic and functional prognosis (d' Addona et al 2012).

Though esthetics is subjective, a common ground exists where all its fundamental principles converge. The impact of various esthetic parameters such as facial forms, facial profiles, maxillary teeth positions, maxillary teeth proportions, smile lines, lip support, gingival display, facial midline, dental midline, horizontal cant, and smile width is of great importance (Bidra 2011).

Lack of sufficient bone and soft tissues to place an implant at the functionally and aesthetically most appropriate position is a common problem, especially in the upper anterior jaw (Pelo et al 2007).

Objective

The aim of this poster is to present clinical cases of implant placement in the aesthetic zone where bone and soft tissue augmentation are needed.

Discussion

The literature has dedicated a considerable amount of its research on the successful maintenance and regeneration of the surrounding gingiva and bone, which are lost following extraction of a tooth.

Implant specialists have gained a greater understanding of the dynamics and anatomical and biological concepts of the periodontium and peri-implant tissues both at the surgical and prosthetic phases of treatment, which contributes to better soft and hard tissue management. The challenge lies in the successful management and modeling of the papilla and gingiva, which are harmonious with the soft tissues of the adjacent natural dentition, and must also be maintainable long-term (Lopez-Mari et al 2011).

When implant placement is decided in the aesthetic zone, a "restoration-driven 3-dimensional" implant placement must be followed (Garber & Belser 1995, Buser & von Arx 2000). Several factors have been identified as influential with regard to the bone and subsequent soft-tissue position and health (Martin et 2002). The height of bone has been found to be the dominant factor associated with the soft tissue contour and the presence of papillae (Kan et 2003).

Surgical augmentation procedures are often required to enhance post-extraction sites. Autogenous bone grafts are a viable treatment option for hard tissue augmentation when there is insufficient bone and particularly the use of block grafts taken from the mandibular symphysis area or the ramus, when a large quantity of graft material is required (d' Addona et al 2012). Moreover, synthetic grafts like bi-phasic calcium sulfate, are suitable for moderate bone augmentation alone or in combination with other graft types.

Various techniques and materials have been proposed to address loss of soft tissues. Newer materials do not surpass the gold standard of subepithilal connective tissue grafts; they do provide improved patient satisfaction and esthetics, reduced postoperative discomfort and surgical time (Jia-Hui et al 2012).

References

1 - Bidra AS. Three-Dimensional Esthetic Analysis in Treatment Planning for Implant-Supported Fixed Prosthesis in the Edentulous Maxilla: Review of the Esthetics Literature. J Esthet Restor Dent 23:219–237, 2011. 2 - Buser D, von Arx T. Surgical procedures in partially edentulous patients with ITI implants. Clin Oral Implants Res 2000;11(suppl):83-100. 3 - d'Addona A, Ghassemian M, Raffaelli L, and Manicone PL. Soft and Hard Tissue Management in Implant Therapy—Part I: Surgical Concepts. International Journal of Biomaterials 2012. 4 - Garber DA, Belser U. Restoration-driven implant placement with restoration-generated site development. Compendium 1995;16:796-802. 5 - Jia-Hui Fu, Chuan-Yi Su, Hom-Lay Wang. Esthetic Soft Tissue Management for Teeth and Implants. J Evid Base Dent Pract 2012:1:129-142. 6 - Kan JYK, Rungcharassaeng K, Umezu K. Dimensions of peri-implant mucosa An evaluation of maxillary anterior single implants in humans. J Periodontol 2003;74:557-562. 7 - López-Marí L, Calvo-Guirado JL, Martín-Castellote B, Gomez-Moreno G, López-Marí M. Implant platform switching concept: An updated review. Med Oral Patol Oral Cir Bucal. 2009;14:450-4. 8 - Martin WC, Morton D, Ruskin JD. Planning for esthetics. Part 1. Single tooth implant restorations. Implant Realities 2002;1:3-9. 9 - Morton D, Martin WC, Ruskin JD. Single-stage Straumann dental implants in the aesthetic zone: considerations and treatment procedures. J Oral Maxillofac Surg 2004;62(Suppl 2):57-66. 10 - Pelo S, Boniello R, Gasparini G, Longobardi G, Amoroso PF. Horizontal and vertical ridge augmentation for implant placement in the aesthetic zone. Int. J. Oral Maxillofac. Surg. 2007; 36: 944–948.

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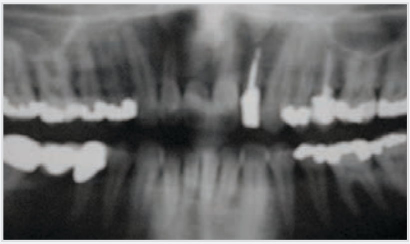
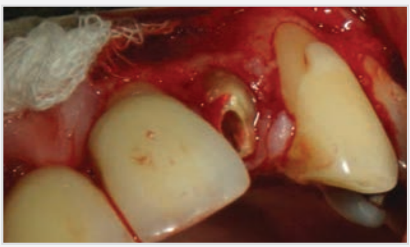
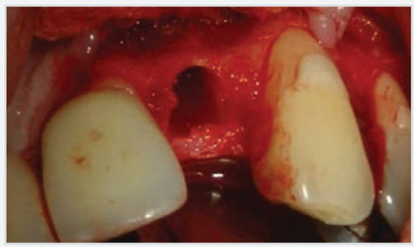
Case 1. Male patient, 42 y.o.


Pre-operative x-ray.


Operative picture of the defect area.


Defect - augmentation site - a


Defect - augmentation site - b

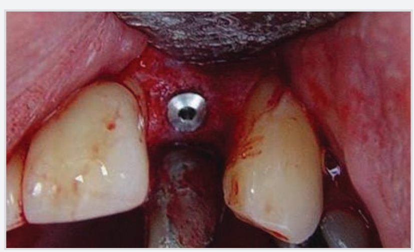

Defect - augmentation site - c

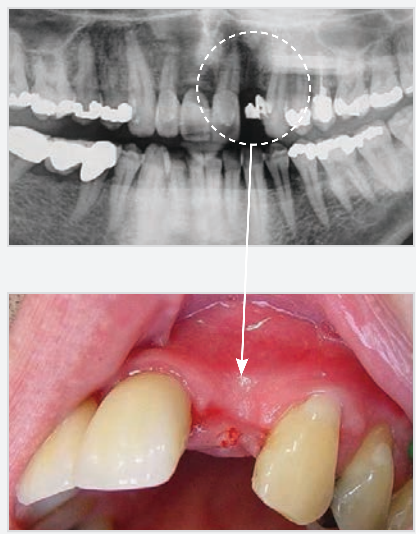

GBR with BONDBONE® and 4BONE RCM collagen membrane


GBR with BONDBONE and 4BONE RCM collagen membrane


Closure – suturing of the flap

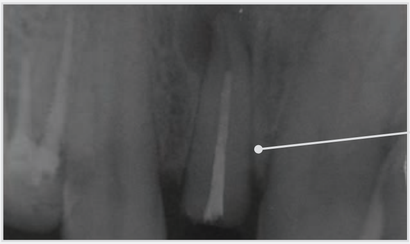

Implant placement - a

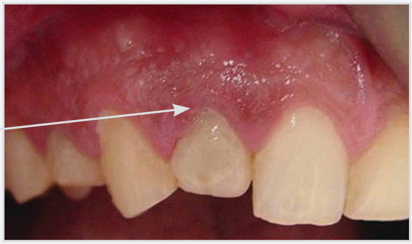

Implant placement - b

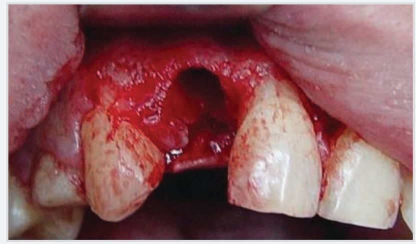

Clinical situation post-operative at re-entry


Clinical situation post-operative: 4 months (final restoration)

Case 2 Male patient, 37 y.o.


Pre-operative x-ray

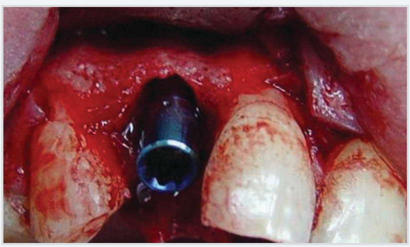

Operative picture of the defect area




GBR with BONDBONE and 4BONE RCM collagen membrane


Closure – suturing of the flap


Clinical situation post-operative at re-entry

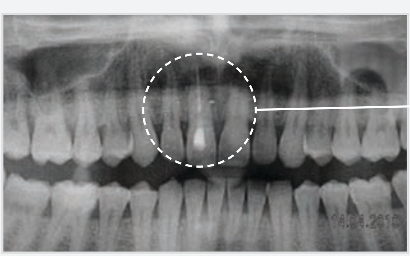

Implant placement - a


Implant placement - b

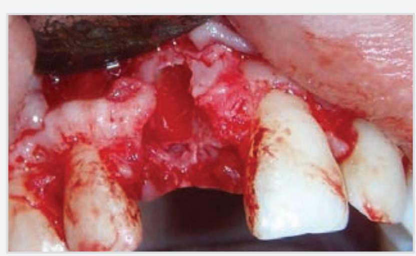

Clinical situation post-operative: 4 months (final restoration)


Clinical situation post-operative at re-entry

Case 3 Male patient, 35 y.o.


Pre-operative x-ray


Operative picture of the defect area


Defect - augmentation site


GBR with BONDBONE® and 4BONE RCM collagen membrane - a


GBR with BONDBONE® and 4BONE RCM collagen membrane - b

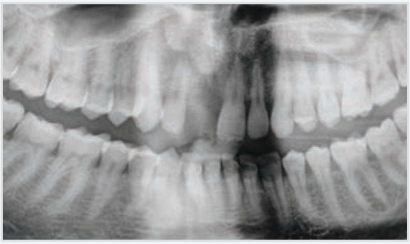

Closure – suturing of the flap


Provisional restoration (Maryland Bridge)


Provisional restoration (Maryland Bridge)


Clinical situation post-operative at re-entry


Clinical situation post-operative at re-entry


X-ray post-operative at re-entry


Implant placement


Implant placement


Final restoration in place

5

Clinical evaluation of implants used for fixed implant supported prostheses. 1-3 years follow-up study.

- Preliminary results.

*A poster presented at the MIS Global Conference, Cannes 2013.

Clinical evaluation of implants used for fixed implant supported prostheses. 1-3 years follow-up study. Preliminary results.

Kyriakaki Ioanna, Skiada Eirini, Kouboura Ioanna,
Zabara Ioanna, Gisakis Ioannis *

Introduction

Implant therapy has become a reliable and predictable treatment alternative for the replacement of missing teeth. Implants have become the most successful prosthetic device and are improving the lives of people every day. They are offering a variety of clinical solutions such as reconstruction of a single tooth, fixed bridges and overdentures. The MIS self-tapping SEVEN® implants (MIS Implants Technologies) are especially designed for implantation in a wide range of bone types and bone augmentation procedures.

Objective

The aim of this poster is to present the results, after 1-3 years of clinical observation, of an ongoing study regarding osseointegration rate and survival rate after loading, of SEVEN® implants used for fixed implant-supported prostheses.

Materials and methods

115 patients (55 male, 60 female) participated in the study, aged 24-85 years old (mean 55.2 years). In total, 305 implants were placed.

The evaluation period was 12-36 months.

In 65 cases, guided bone regeneration (GBR) was applied with the use of autologous bone graft and allograft, in combination with bi-phasic calcium sulphate (BONDBONE®, MIS Implants Technologies), or bi-phasic calcium sulphate alone.

In 35 cases, a resorbable collagen membrane (4BONE RCM, MIS Implants Technologies) was used to protect the graft.

All patients underwent detailed clinical and radiographic examination every 6 months, or earlier in cases of bruxism, heavy smoking and diagnosed periimplantitis (fig.1 - fig.9).

Statistical Analysis

The analysis was performed using the program IBM SPSS Statistics v.19 (IBM corp, NY, USA). Descriptive statistics were used for patient demographics and analysis of biological complications and failures. The implant survival was calculated using life table analysis (Cutler & Ederer 1958). The threshold value for significance was set at $p \leq 0.05$.

Results

In general, osseointegration was achieved for 302 implants (99.02%), while only 3 implants failed to osseointegrate (0.98%) ($p<0.001$). From these, 2 implants were placed with GBR and 1 implant in host bone ($p>0.05$).

Peri-implantitis was revealed in 4 implants (1.32%), mostly after the 24th month.

Only 1 implant (0.33%) was lost after loading during the observation period (fig.10 - fig 23).

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 99.02%.
- The application of bone regeneration techniques with the use of bi-phasic calcium sulphate is a reliable method.
- Implant survival rate after loading was 99.67%.

*Dept Oral & Maxillofacial Surgery, School of Dentistry, University of Athens; Dept Dental Implant & Tissue Regeneration, Hygeia hospital, Athens, Greece

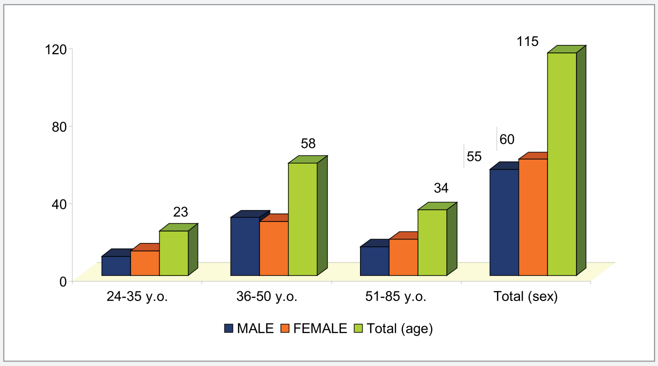


Fig. 1 Distribution according to sex & age

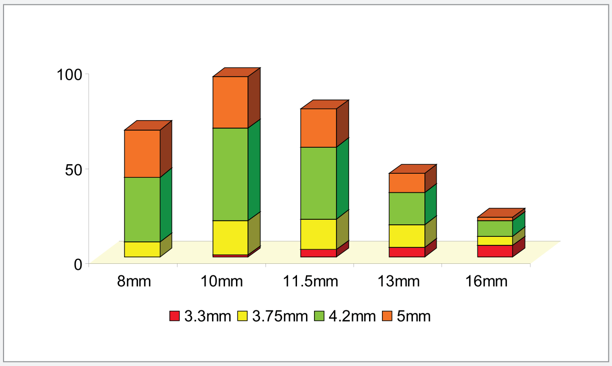


Fig. 2 Characteristics of implants placed I

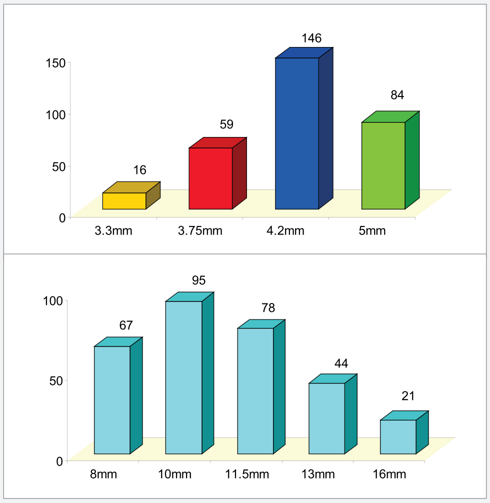


Fig. 3&4 Characteristics of implants placed II & III.

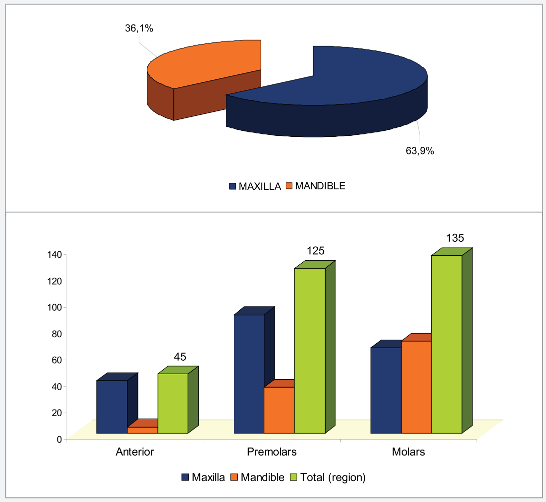


Fig. 5&6 No of implants placed according to jaw & jaw site.

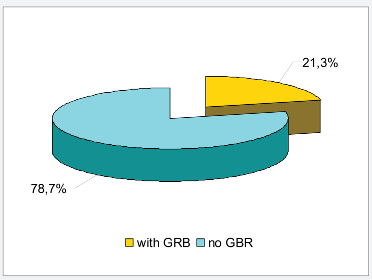


Fig. 7 No of implants placed according to GBR application.

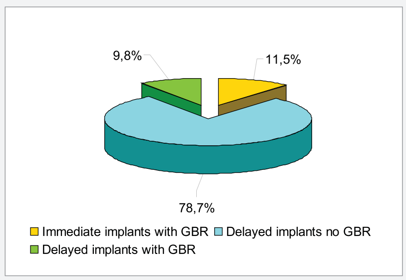


Fig. 8 Time of implant placement, in relation to GBR.

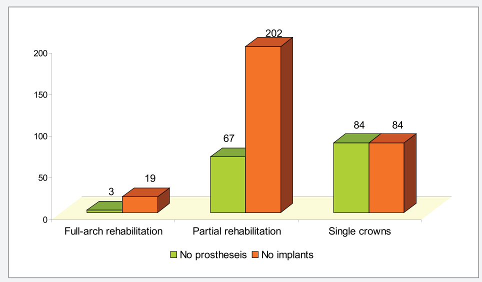


Fig. 9 Types of prosthetic rehabilitations and the related No of implants.

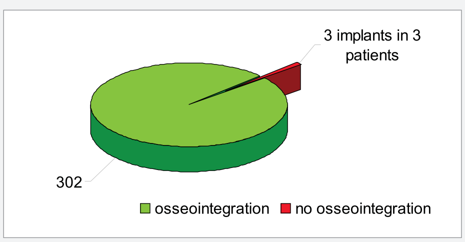


Fig. 10 Prevalence of osseointegration.

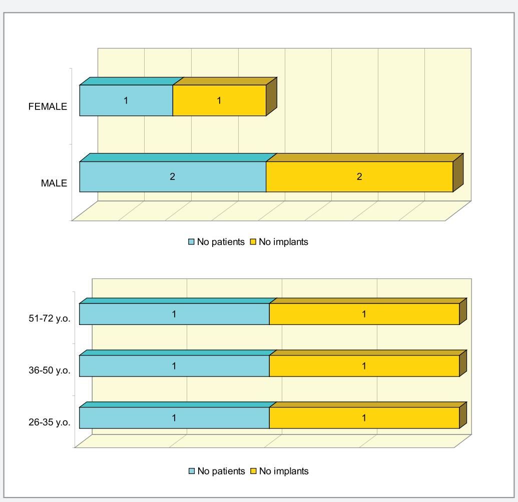


Fig. 11&12 Prevalence of no-osseointegration in relation to sex & age.

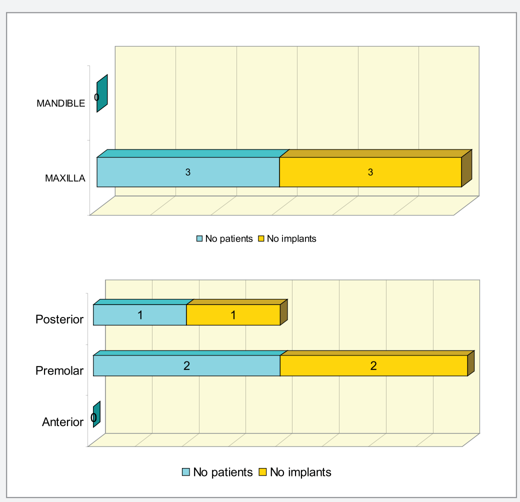


Fig. 13&14 Prevalence of no-osseointegration in relation to jaw & jaw site.

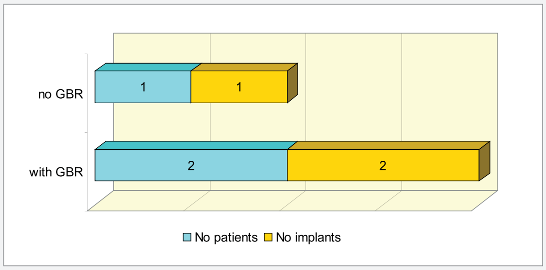


Fig. 15 Prevalence of no-osseointegration in relation to GBR.

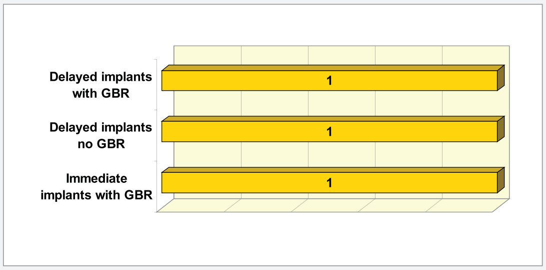


Fig. 16 Prevalence of no-osseointegration in relation to time of implantation & the use of GBR.

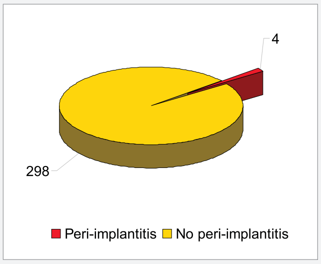


Fig. 17 Prevalence of osseointegration.

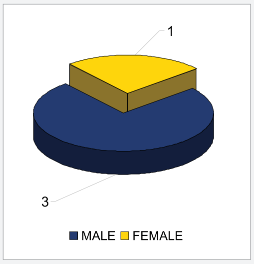


Fig. 18 Prevalence of peri-implantitis in relation to sex.

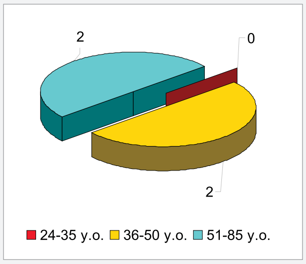


Fig. 19 Prevalence of peri-implantitis in relation to age.

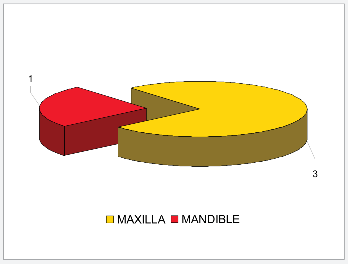


Fig. 20 Prevalence of peri-implantitis in relation to jaw.

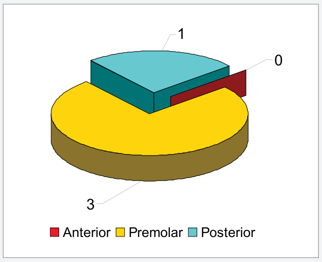


Fig. 21 Prevalence of peri-implantitis in relation to jaw site.

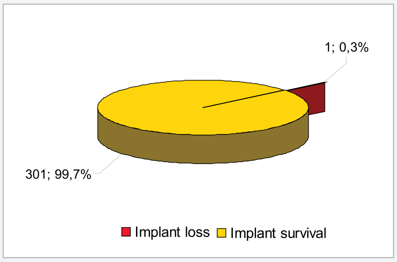


Fig. 22 Prevalence of implants survival & loss.

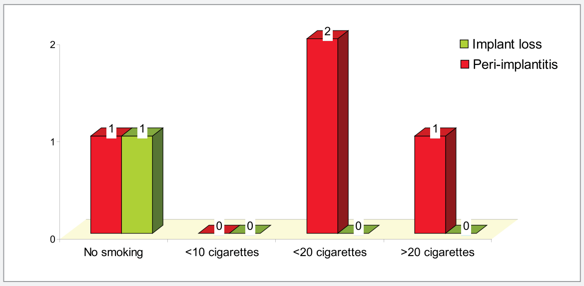
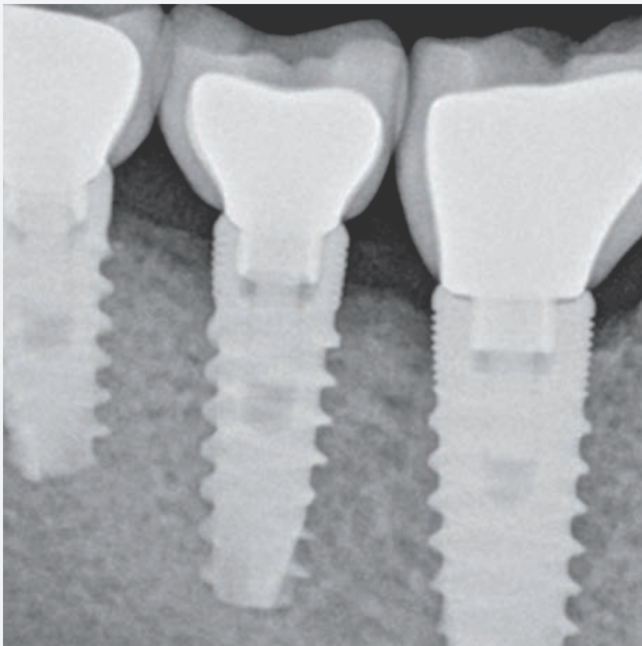


Fig. 23 Prevalence of peri-implantitis & implant loss in relation to smoking habits.



6

Oral rehabilitation with implants in patients with osteoporosis, without implication on oral cavity.

*A poster presented at the MIS Global Conference, Cannes 2013.

Oral rehabilitation with implants in patients with osteoporosis, without implication on oral cavity.

Espirito Santo J.[1], Seabra M.[2], Leitao J.[2], Fonseca D.[2], Vasquez L.[2]

Objective

To analyze the clinical implication of the use of dental implants in patients suffering from a systemic skeletal disease (osteoporosis).

Case Data

A female, 54 years of age, with no harmful habits, who was diagnosed as suffering from Osteoporosis based on WHO criteria. Treatment plan aimed to restore missing teeth by using 7 dental implants and fixed restorations. Radiographic evaluation reveal horizontal and vertical bone deficit, that requires grafting and sinus augmentation respectively.

Conclusions

The fact that a patient has osteoporosis MAY NOT be an absolute contraindication for implant placement, sinus augmentation or bone grafting procedures. These patients should not be excluded from this type of treatment, and should be able to benefit from the advantages of dental implant prosthetics.

References

▪ Zarb GA, Smith A. The longitudinal clinical effectiveness of osteointegrated dental implants: the Toronto study. Part I. Surgical results. J Prosthet Dent 1990; 63:451-7 ▪ Zarb GA, Smith A. The longitudinal clinical effectiveness of osteointegrated dental implants: the Toronto study. Part II. The prosthetic results. J Prosthet Dent 1990;64:53-61 ▪ Berglundh T, Persson L, Klinge B. A systematic review of the incidence of biological and technical complications in implant dentistry reported in prospective longitudinal studies of at least 5 years. J Clin Periodontol 2002;29:197-212 ▪ Weber HP, Crohin CC, Fiorellini JP. A 5-year prospective clinical and radiographic study of non-submerged dental implants. Clin Oral Implants Res 2000;11:144-153 ▪ Consensus Development Conference. Diagnosis, Prophilaxis, and treatment of osteoporosis. Am J Med 2003:94,646-650 ▪ Rico Lenza H, Pérez Infante V. Edad sexo y hueso II. Rev Esp Gerontol 2004:54,409-416 ▪ Nishimura I, Hosokawa R, Atwood DA. The knife-edge tendency in mandibular ridges in women. J Prosthet Dent 2002:67(6),820-826 ▪ Dao TT, Anderson JD, Zarb GA. Is osteoporosis a risk factor for osseointegration of dental implants? Int J Oral Maxillofac Implants 2003 8:137 ▪ Friberg B. Treatment with dental implants in patients with severe osteoporosis: A case report. Int J Periodont Res Dent 14:349,2004

[1]Medico Dentisa, Especialista Universitario en Implantologia Oral pela Universidade Santiago de Compostela, Docente de la Universidade Catoilica Portuguesa. [2]Medico Dentista Docente da Universidade Catoliica Portuguesa

Diagnosis of osteoporosis. Age: 54. Sex: Female. Smoking: No. Harmful Habits: No. Current Conditions: Osteoporosis. Allergy or Medications: None. Rating: ASA II.

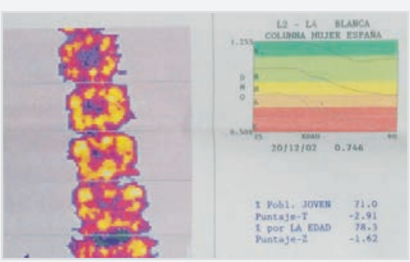


Fig. 1


Fig. 2


Fig. 3


Fig. 4


Fig. 5


Fig. 6

Maxilla.

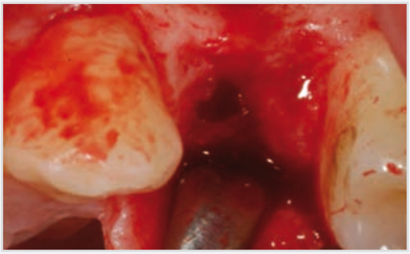


Fig. 7

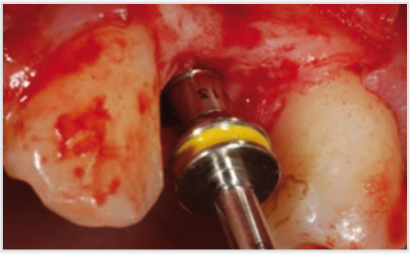


Fig. 8

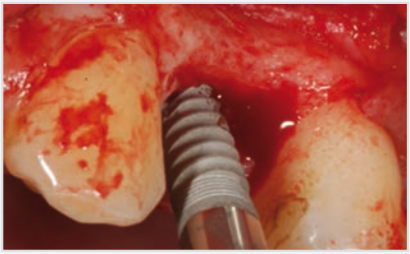


Fig. 9

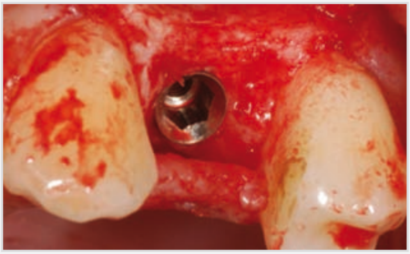


Fig. 10

Sinus Augmentation.

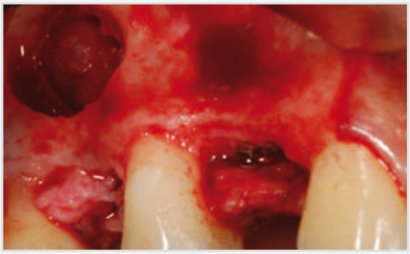


Fig. 11

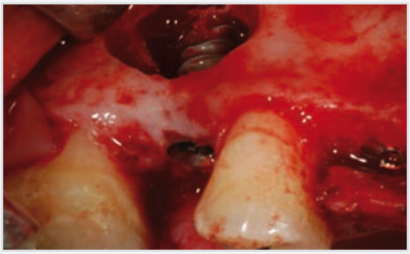


Fig. 12

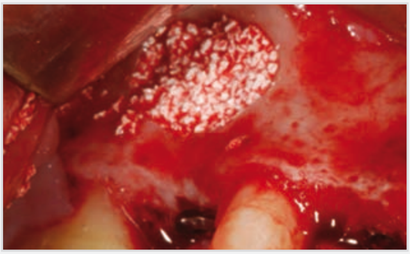


Fig. 13

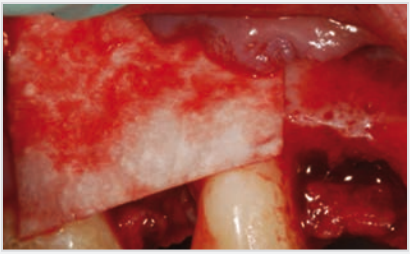


Fig. 14

Mandible.

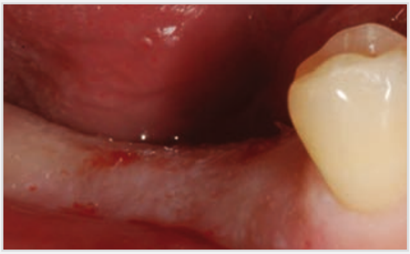


Fig. 15

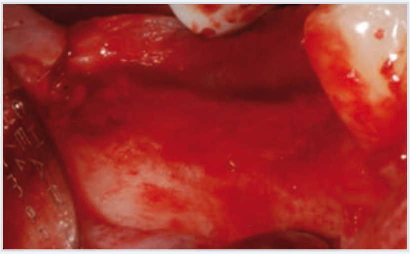


Fig. 16

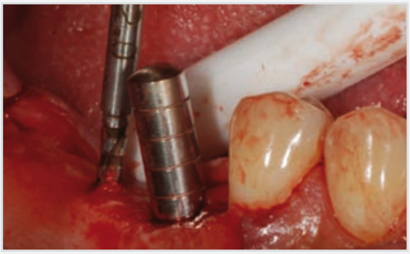


Fig. 17

Results.


Fig. 18


Fig. 19


Fig. 20


Fig. 21


Fig. 22

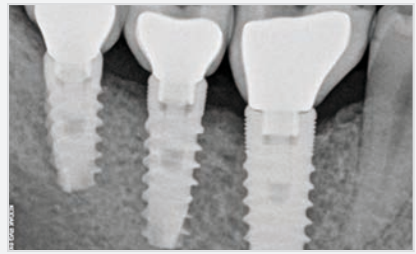


Fig. 23


Fig. 24


Fig. 25


Fig. 26


Fig. 27


Fig. 28


Fig. 29


Fig. 30

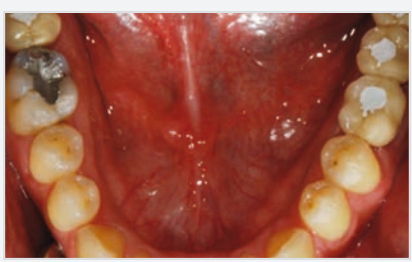
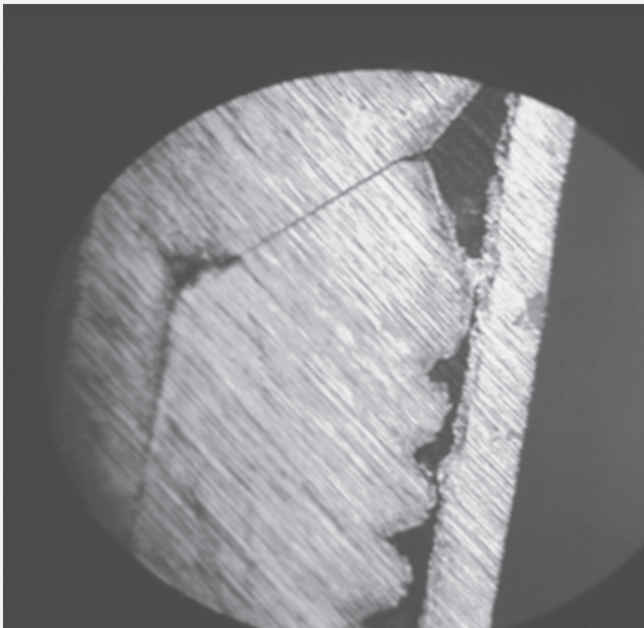


Fig. 31



7

Adjustment of manufacturers' design and generic abutments on dental implants.

*A poster presented at the MIS Global Conference, Cannes 2013.

Adjustment of manufacturers' design and generic abutments on dental implants.

A. Kaplan[1] and A. Macchi[2]

Objective

The aim of this study was to evaluate the adjustment of dental implants – abutments using different combinations: same manufacturer VS generic abutments.

Materials and methods

The implants evaluated were M4 and SEVEN® (MIS Implant Technologies) and the abutments were MIS and generic manufactured for M4 and SEVEN®. This design left four groups depending on implant - abutment combination: G1: M4-MIS, G2: SEVEN® -MIS, G3: M4-generic and G4: SEVEN-generic. Implants – abutments were adjusted using MT-RI030 ratchet wrench. In order to keep the sets together, the specimens were included in acrylic resin and cut using a low speed saw. They were observed under a metallographic microscope (Carl Zeiss) and photographed in order to determine the distance between abutment and implant at the implant neck. The gap at the junction was determined at both ends of the implant: internal (I) and external (E). Measurements were carried out using UTHSCSA Image tool. Results were statistically analyzed using ANOVA and Tukey HSD test for mean comparison.

Results

Mean (mm) and standard deviation obtained for each group were: GI: I 0.008(0.004) E:0.008(0.004), G2: I: 0.004(0.005) E: 0.004(0.005), G3: I: 0.362(0.09) E: 0.01(0.00), G4: I: 0.406(0.004) E: 0.006(0.005). ANOVA proved results to be significantly different ($p=0.00$) at the internal junction and not significant ($p=0.214$) at the external junction. Tukey test showed two homogeneous groups at the internal end: groups 1 and 2 on one side and 3 and 4 on the other. M4-MIS and SEVEN® -MIS were significantly different from M4-Generic and Seven-Generic.

Conclusions

Based on the obtained results it is recommended to use a combination of implants and abutments that are specially fabricated by the same manufacture. Although some generic abutments may seem compatible, discrepancy in adaptation could create irregular force distribution or fluid accumulation which may lead to failure.

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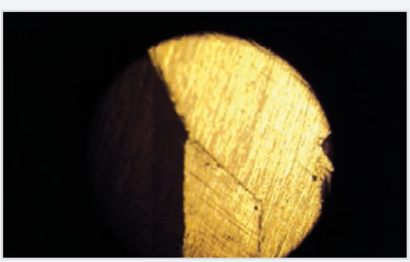
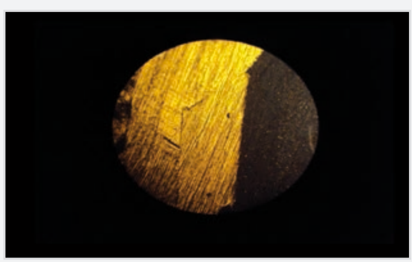
[2] Dental Lab Technician Course, University of Buenos Aires, Ciudad de Buenos Aires, Argentina.

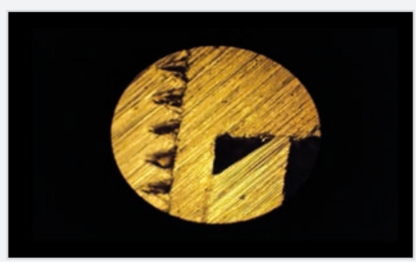
Materials and methods



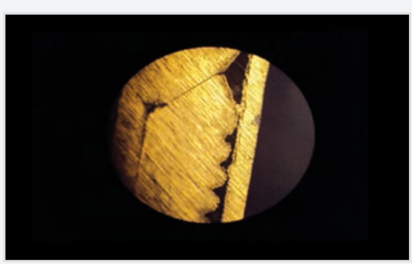
Results



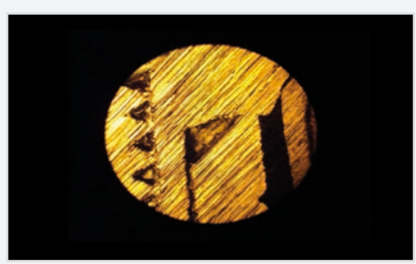
M4 MIS



M4 Generic

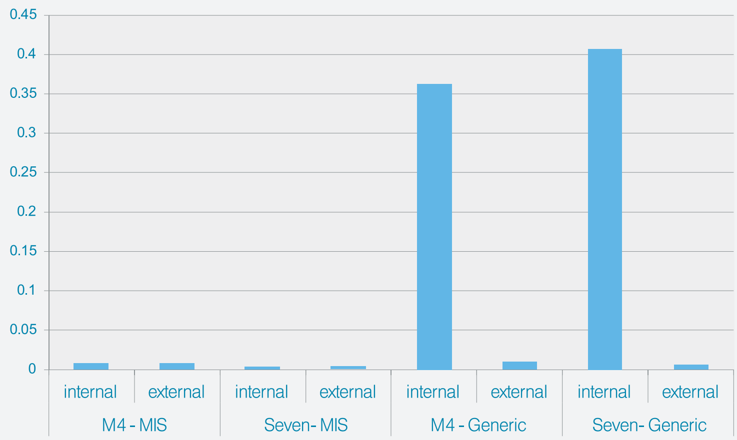


SEVEN® MIS



SEVEN® Generic

Mean values of distance Implant - Abutment



M4 - MIS		SEVEN - MIS		M4 - Generic		SEVEN - Generic		
internal	external	internal	external	internal	external	internal	external	
0,008	0,008	0,004	0,004	0,362	0,01	0,406	0,006	Mean
0,004	0,004	0,005	0,005	0,099	0	0,044	0 ,005	SD

ANALYSIS OF VARIANCE

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	External	1,000E-04 a	3	3,333E-05	1,667	,214
	Internal	,719 b	3	,240	80,257	,000
Intercept	External	9,800E-04	1	9,800E-04	49,000	,000
	Internal	,761	1	,761	254,561	,000
Group	External	1,000E-04	3	3,333E-05	1,667	,214
	Internal	,719	3	,240	80,257	,000
Error	External	3,200E-04	16	2,000E-05		
	Internal	4,780E-02	16	2,987E-03		
Total	External	1,400E-03	20			
	Internal	1,528	20			
Corrected Total	External	4,200E-04	19			
	Internal	,767	19			

a. R Squared = ,238 (Adjusted R Squared = ,095)
b. R Squared = ,938 (Adjusted R Squared = ,926)

EXTERNAL

	Group	N	Subset
			1
TukeyHSD a,b	2,0000	5	4,00E-03
	4,0000	5	6,00E-03
	1,0000	5	8,00E-03
	3,0000	5	1,00E-02
	Sig.		,188

Means for groups in homogeneous subsets are displayed. Based on Type III Sum of Squares. The error term is Mean Square(Error) = 2,000E-05.

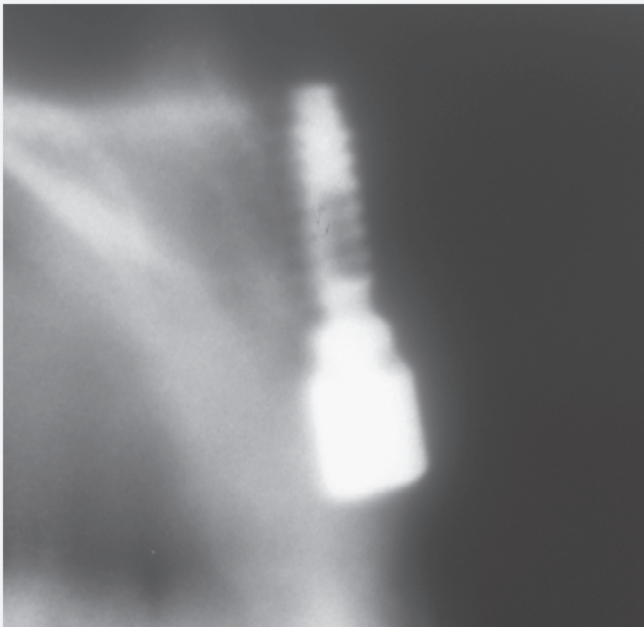
a. Uses Harmonic Mean Sample Size = 5,000.
b. Alpha = ,05.

INTERNAL

	Group	N	Subset	
			1	2
TukeyHSD a,b	2,0000	5	4,00E-03	
	1,0000	5	8,00E-03	
	3,0000	5		,362000
	4,0000	5		,40600
	Sig.		,999	,592

Means for groups in homogeneous subsets are displayed. Based on Type III Sum of Squares. The error term is Mean Square(Error) = 2,987E-03.

a. Uses Harmonic Mean Sample Size = 5,000.
b. Alpha = ,05.



8

M4 on autologous bone graft. A solution to an implant failure. Clinical, radiographic and tomographic evaluation.

*A poster presented at the MIS Global Conference, Cannes 2013.

M4 implant on autologous bone graft. A solution to an implant failure. Clinical, radiographic and tomographic evaluation.

Jorge Luis García[1], Silvana A. Díaz[2], Federico E Miño[3]

Abstract

The anterior region single-crown restoration supported by implants is now a viable and predictable treatment modality to replace a missing single tooth. 1-2 Three-dimensional analysis of surgical space and its environment, and implant planning based on the final restoration, will lead us to a good cosmetic outcome. The technology for diagnosis, such as CT scans with axial cutouts, would resolve those cases where the quantity and quality of bone is not adequate. The decreased sagittal-alveolar process prevented the placement of the implant in an ideal situation. Suitable diagnosis lead us to perform, beforehand, a technique that allows bone regeneration and ideally apico-coronal implant placement. Gingival biotype evaluation, the maintenance of intact proximal papillae (Tarnow et al., 2003)[3], the use of provisional crown to optimize the emergence profile until the soft tissue healed, are required for successful treatment. MIS M4 implants are titanium cylinder screw type implants with an internal hexagon connection and treated surfaces, to provide secure primary fixation and better distribution of forces. The use of ceramic abutments aims to maximize esthetics. The zirconia abutments (MIS, MD-CR010), biocompatible, ensure biological, esthetic and functional expectations[4].

Case presentation

A 21-year-old woman is presented to our department with an implant in the left upper incisor area. Clinical examination shows a labial position of the fixation (Fig. 1), which is confirmed by the tomographic examination, which also confirms the presence of the healing cap of the second phase (Fig. 2).

The first stage was based on surgical removal of the implant, which was not osseointegrated (Fig. 3) and the remaining bone defect reparation (Fig. 4), with onlay autologous bone graft (5mm x 10mm) from chin donor site (Fig. 5), adapted manually and set with micro screws (Fig. 6). To improve healing PRP was placed. After graft healed (Fig.7), a dental implant (MIS, MF4-13375) 3.75 mm in diameter and 13mm in length is inserted (Fig. 8). A less aggressive type of implant for grafting was chosen. The implant should be placed in ideal position, in apico coronal, mesio-distal and palatal or lingual labial angulation (Fig. 9).

At the time of reopening, an incision is made to preserve interdental papillae and a provisional crown is inserted, using a plastic temporary abutment (MIS, MD-TPH50), in order to guarantee aesthetics and function, while accompanying maturation of tissues (Fig. 10). Once this stage is complete, the final restoration is performed with a zirconium aesthetic pillar (Fig. 11), with the addition of ceramic coating (Fig. 12).

Results

Treatment success in the loss of an anterior tooth with loss of bone volume is based on an accurate diagnosis for an accurate treatment planning. In this case, the three-dimensional defects evaluation and its repair with a graft block from chin, improved the dense bone contact surface area for placing the implant (Fig. 13). The use of postoperative CT confirmed the correct three-dimensional position of the implant, and immediate paraxial slices showed the good relationship of the implant with the image of the coronal portion of the adjacent tooth and peri-implant bone and sharing it with the graft (Fig. 14). The mesio-distal location of the implant is important as it enables the restoration of proportional interdental papillae (Fig. 15). M4 implant platform is similar to diameter of the tooth to be replaced and therefore does not compress the interproximal bone tissue, which favors the formation of papilla and the emergence profile.

The use of a provisional crown led to gingival healing and allowed reaching the final contour[5-6-7-8]. The pillar of zirconia (MIS Implants Technologies) used in this case, promotes epithelial adhesion 1.5 to 2mm in height between the bone level and peri-implant tissue and prevents bacteria adhesion[9] (Fig. 16).

Conclusions

The first restoration of a tooth with a crown supported by an implant was published by Branemark (Nobel Biocare) in December 1982 [10-11]. The restoration of a single tooth implies a great challenge. The high survival rate confirms that it is predictable and valid. In this case, treatment planning for single tooth implant prosthesis requires an understanding of the following conditions: osseointegation relative to bone quality and quantity, the need for bone regeneration techniques, the anatomic position within the dental arch, biotype of the gingiva, the preservation of the interdental papilla, enhancement of the emergence profile, and esthetic expectations of the patient for success in the rehabilitation of anterior teeth with implants.

M4 implant (MIS Implants Technologies) is made of Ti-6Al-4V ELI, with a surface treatment of Sandblasting and Acid Etching. This double surface treatment increases their areas of osseointegration by creating micro and nano structures and shows that adverse situations, such as graft, reacts well. The use of a zirconia abutment is a good alternative for the development of aesthetic restorations since ceramic crowns with high translucency provide a substrate similar to natural tooth color, and avoids thin gingival biotypes from showing metallic color in gingival area. Due to its high strength and flexural elasticity, the

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Fig. 1 Preopratory.

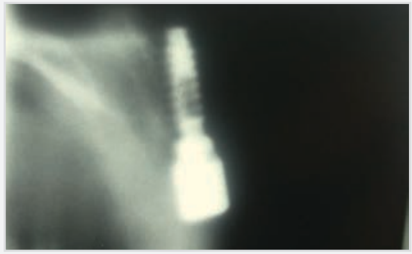
Fig. 2 Tomographic analysis.

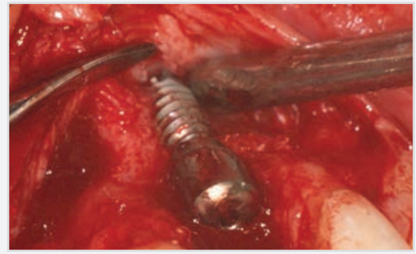
Fig. 3 Implant failure.

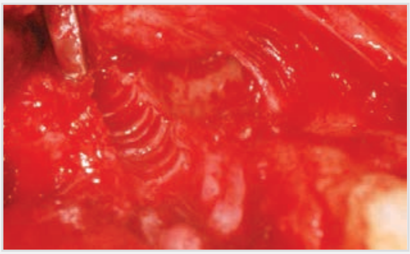
Fig. 4 Bone defect.

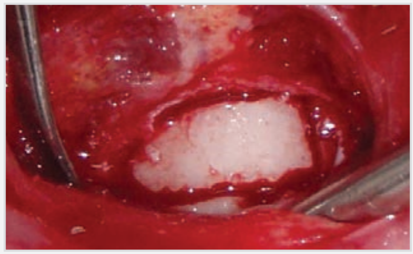
Fig. 5 Chin graft.

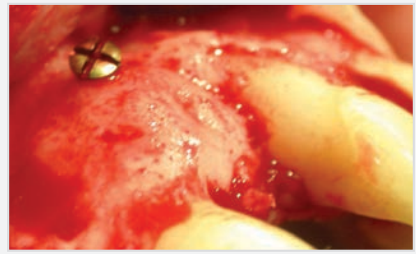
Fig. 6 Onlay autologous bone graft.

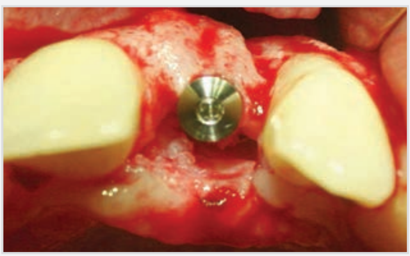
Fig. 7 Cover screw.

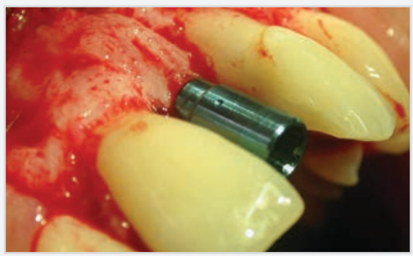
Fig. 8 M4 implant.

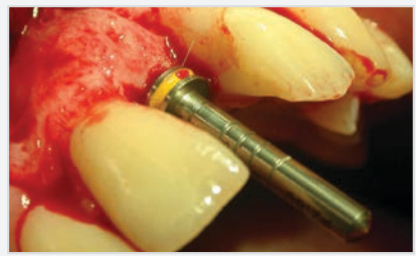
Fig. 9 Implant direction.


Fig. 10 Temporary crown.


Fig. 11 ZIRCON-ZRO2 abutment.


Fig. 12 Zirconia crown.


Fig. 13 Bone graft.

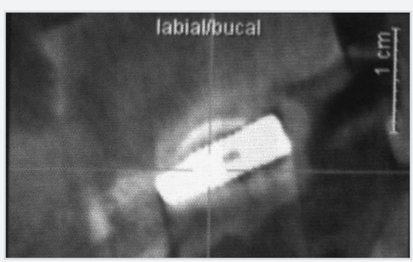

Fig. 14 M4 implant.


Fig. 15 Interproximal papillae.


Fig. 16 Final restoration.


Fig. 17 Final restoration.

behavior of this material can be considered predictable over time[12]. The use of a crown screwed rest prevents removal of cement which avoids bacterial colonization, and facilitates the removal of the superstructure when it is necessary[13] (Fig.17)

References

1 - Branemark P-I.,Breine U, Adell R, et al. Intra-osseous anchorage of dental prostheses I. Experimental studies. Scand J Plast Reconstr Surg 1969; 3:81-100. 2 - Adell R, Lekholm U, Rockler B, Branemark P-I. A-15-years study of osseointegrated implants in the treatment of the edentulous jaw. Int J Oral Surg 1981; 6: 387-416. 3 - Tarnow DP, CHO SC. Wallace SS. The effect of inter-implant distance of the height of inter-implant bone crest. J Periodontol, 2007; 71:546-9. 4 - Cohelo, Silva, Bonfante. Fatigue testing of two porcelain-zirconia all ceramic crown systems.2009; 25:1122-1127. 5 - Jemt T. Restoring the gingival contour by means of provisional resin crowns after single implant treatment. Int J Periodontics Restorative Dent. 1999 19(1): 20-9. 6 - Stein JM, Nevyns M. The relationship of the guided gingival frame to the provisional crown for a single implant restoration. Compend Contin Educ Dent. 1996; 17(12) :1175-82. 7 - Chee WW, Donovan T. Use of provisional restorations to enhance soft tissue contours for the implant restorations. Compend Contin Educ Dent. 1998; 19(5):481-6, 488-9;quiz 490. 8 - Macintosh DC, Sutherland M. Metod for developing an optimal emergence profile using heat- polomerized provisional restoration for single-tooth implant-supported restorations. J Prosthet Dent. 2004; 91 (3):289-92. 9 - Rimondini L, Cerroni L, Carrassi A, Torricelli P. Bacterial colonization of zirconia ceramics surfaces: An in vitro and in vivo study. Int J Oral Maxiliofac Implants 2002;17 (6): 793-8. 10 - Manicone. An overview of zirconia ceramics: basic properties and clinical applications. J Dent 2007;35:819. 11 - Jemt T. Modified single and short-span restorations supported by osseointegrated fixtures in the partially edentulous jaw. JProsthet Dent 1986;55:243-246. 12 - Jemt T, Lekholm U, Grondahl K. A3-year follow-up study of early single-implant restorations ad modum Branemark. Int J Periodont Rest Dent 1990;10:341-349. 13 - Wannfors K, Smedberg JI. A prospectic clinical evaluation of different single-tooth restoration designs on osseointegrated implants. A 3-year follow-up of Bränemark implants. Clin Oral implants Res. 1997; 10(6):453-8.

9

Vital bone formation in sockets with composite grafts containing 50% biphasic calcium sulfate (BPCS).

*A poster presented at the MIS Global Conference, Cannes 2013.

Vital bone formation in sockets with composite grafts containing 50% biphasic calcium sulfate (BPCS).

R. Horowitz[1], M Freire[2], H Prasad[3], M Rohrer[3]

Introduction

Predictable bone regeneration is one of the goals of successful therapy at the time of tooth extraction. Numerous bone replacement graft materials have been used for this purpose. Some graft materials have shown either volume preservation or vital bone formation to some extent. The combination of biphasic calcium sulfate (BPCS) with different materials gives the surgeon many options for grafting sockets. Utilizing a 1:1 mixture of the quickly resorbing, shape maintaining CS with mineralized or demineralized allograft will alter the resorption characteristics of the mixture. The goals are to maximize both volume preservation and vital bone formation leaving minimal residual graft in the site.

Methods

The cases demonstrated here included teeth removed by atraumatic extraction. Teeth were removed with periotomes and elevators in general, with the addition of Piezosurgery if required. Flaps were only elevated if required for debridement. After thorough debridement, the area was grafted with a 1:1 mixture of biphasic calcium sulfate and alloplast or allograft. The sites were covered with a barrier and allowed to heal from 4 to 6 months before reentry. Cone beam tomography determined volume preservation and bone density at the end of healing. A core of bone was retrieved at the time of implant placement and sent for micro CT and histologic analysis.

Result

Clinically the volume of the extraction sockets was preserved well with all composite grafts tested in this study. Vital bone was formed both where the calcium sulfate fully resorbed and in place of the other graft materials used in the composite mixtures. The percentage of vital bone in the cases shown here ranged from 65-80%. This is significantly higher than most other studies in the literature, which show 25-35% bone with other grafts.

Conclusion

The addition of biphasic calcium sulfate to graft materials gives the surgeon many advantages over a particulate graft alone. The material handles better and does not wash out of the socket. There are significant biologic advantages including increased angiogenesis and more and quicker vital bone formation than with conventional particulate grafts alone. Combining these characteristics makes composite grafts incorporating biphasic calcium sulfate an ideal addition to the armamentarium of the implant surgeon. Bone grafting extraction sockets with a 1:1 mixture of BPCS and various graft materials preserves alveolar ridge volume and fills the site with a high percentage of vital bone. This may be the most affordable "growth enhancer" we can use to increase the predictability of bone regeneration intra-orally.

References

Horowitz RA, Rohrer MD, Prasad HS, Tovar N, Mazor Z. Enhancing extraction socket therapy with a biphasic calcium sulfate. Compend Contin Educ Dent. 2012;33(6):420-6, 428.

R Horowitz, D Holtzclaw, PS Rosen. A Review on Alveolar Ridge Preservation Following Tooth Extraction. J Evidence-Based Dent Pract. 2012; 12: 3 - pp149-160.

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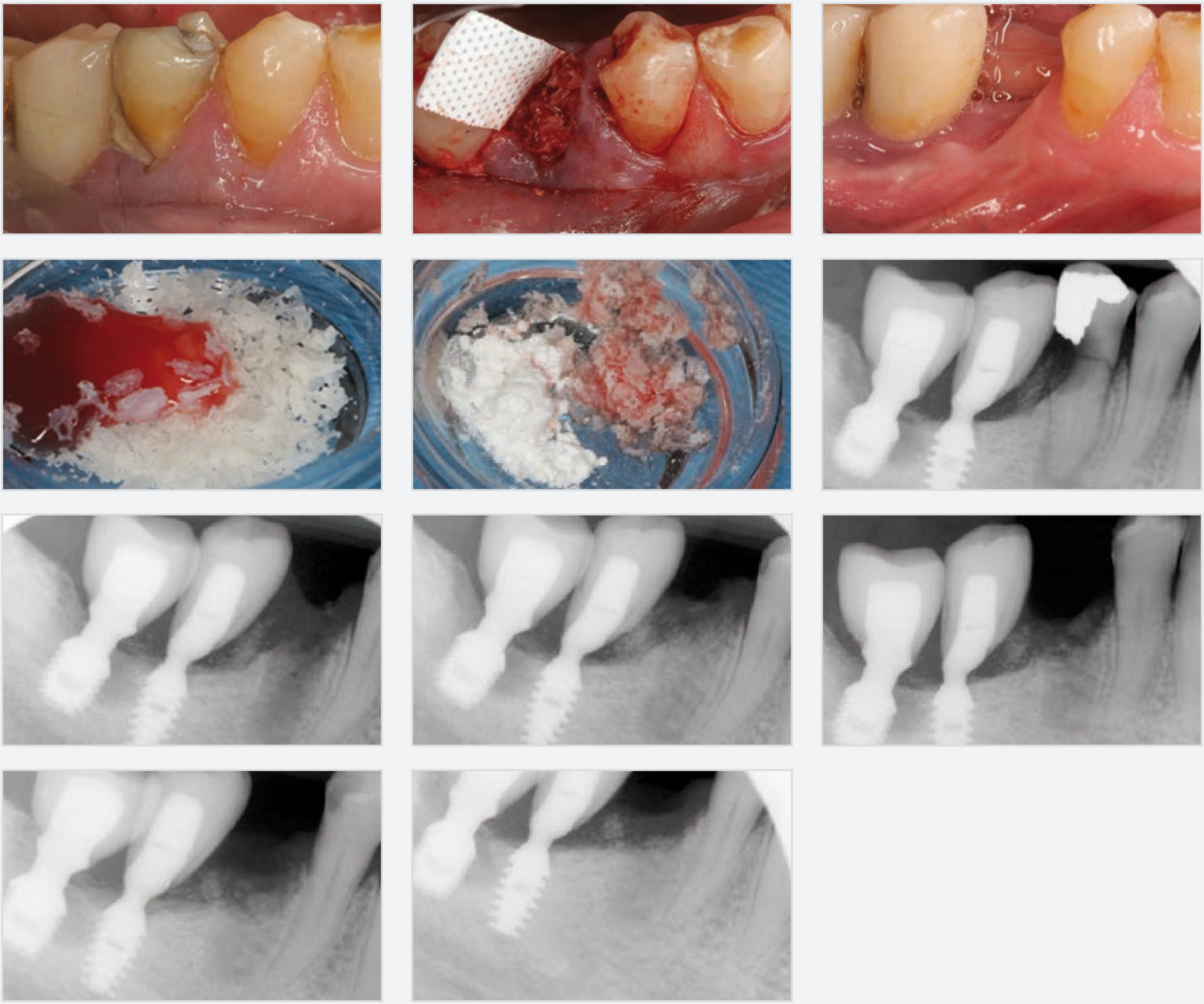
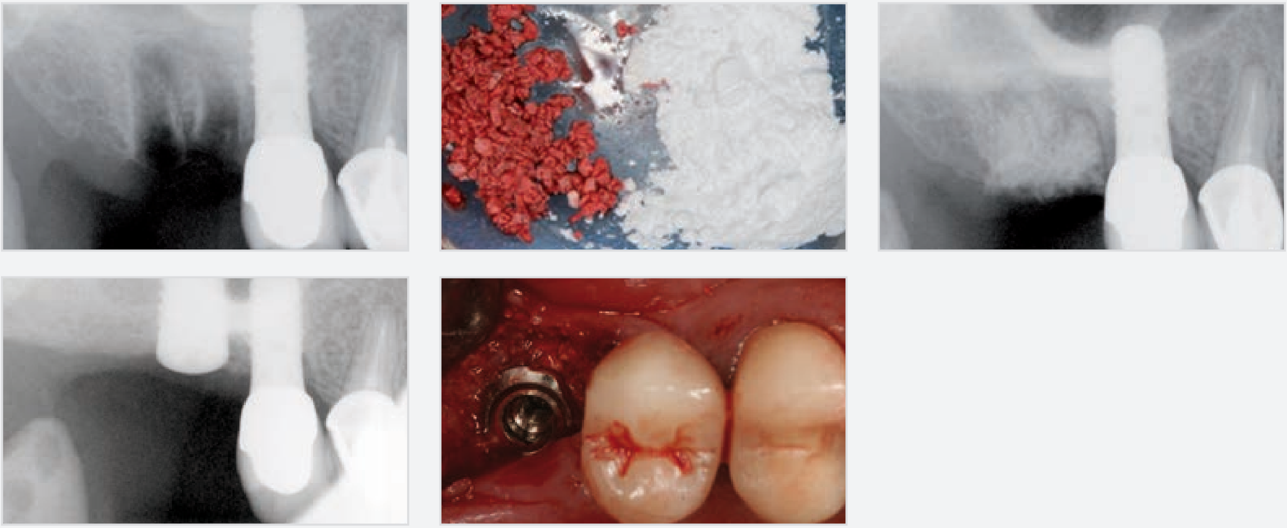
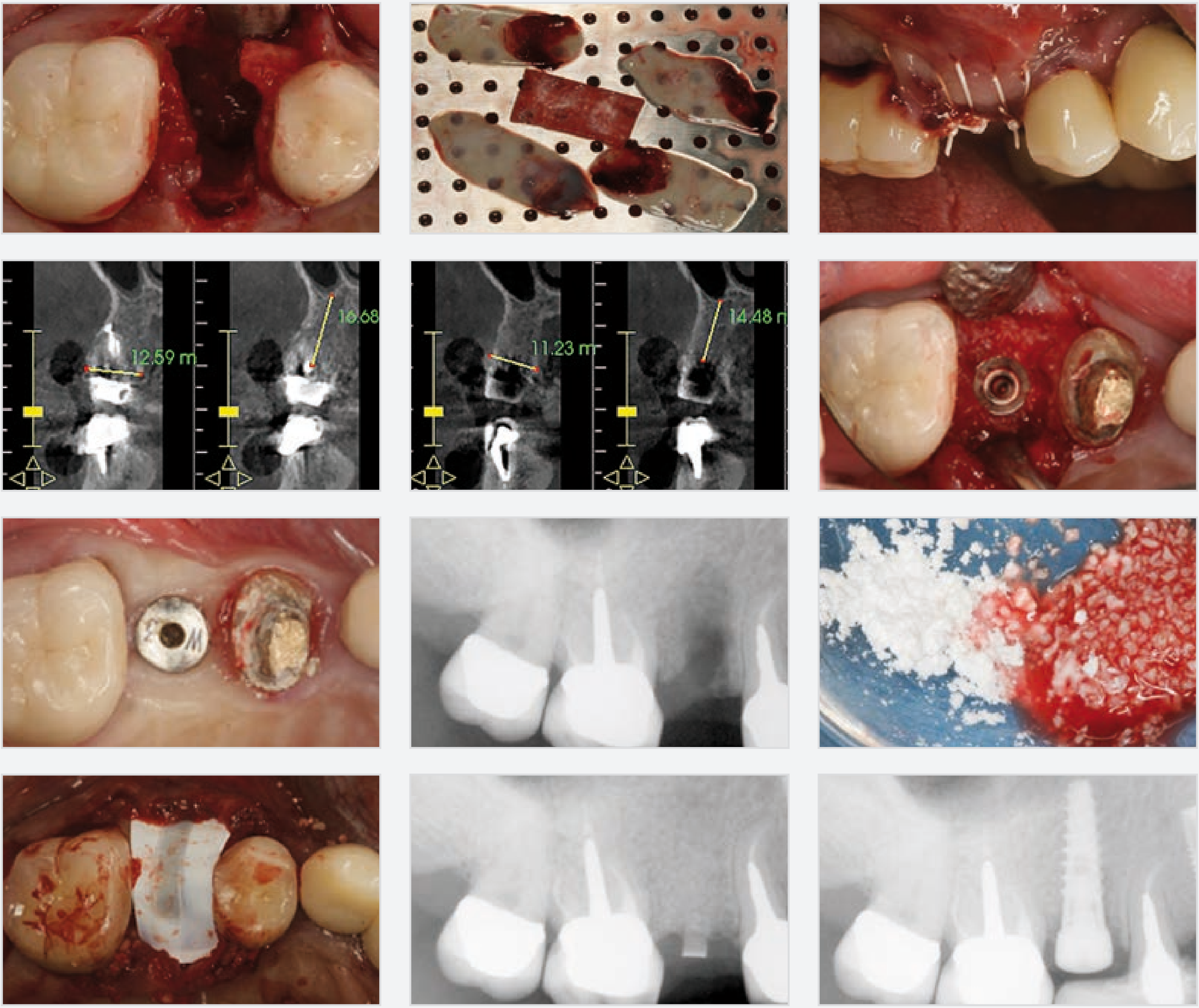
1. Tooth 29 is extracted, grafted with Exactech FDB/DFDBA, PRF and BPCS. Cytoplast barrier placed over the graft, removed 3 weeks later. By 11 weeks, the X-ray appears fully mineralized. The hard tissue volume is preserved (ridge height and width) and keratinized tissue enhanced. Ideal healing resulted from the composite BPCS graft and simple techniques.



2. Atraumatic, flapless extraction. Site grafted with 1:1 TCP and BPCS, cytoplast barrier for 3 wks. Four-month healing when implant is placed shows ridge preserved. Clinical appearance of Graft resorption and replacement with vital bone. A digital, IOS Fastscan impression is taken to enable a high tech, screw-retained restoration of a zirconia crown with titanium insert.

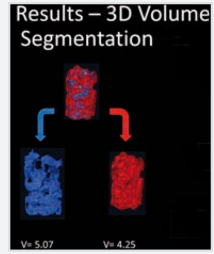


3. No buccal plate - grafted with FDBA in PRF and BPCS. Barriers of PRF, collagen and Ti reinforced PTFE and were used. At 7 months, CBCT and re-entry show full restoration of bone. The final restorarion shows ideal aesthetics.

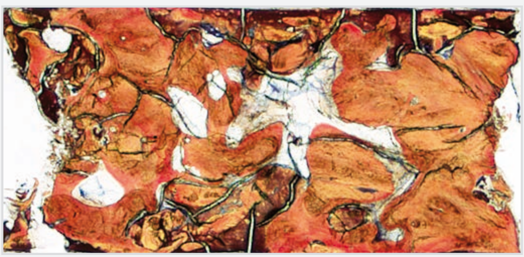


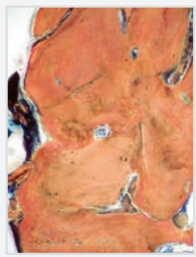
4. After fracture, tooth 10 was extracted and grafted with 1:1 DFDBA and BPCS, BioExclude barrier. The area healed, implant was placed at 4 months. Very high ISQ enabled immediate temporization with custom, CAD CAM components. Final impressions were taken 5 months postoperatively for insertion of a screw-retained Zirconia crown with a titanium insert. The use of the custom components enabled ideal tissue contouring from the day of implant insertion through final restoration.

Patient 2 . 87% preservation of volume, full resorption of all graft: 80% bone, all vital. In this region of the mouth, normal bone is 25% bone.

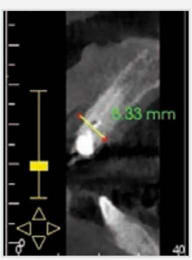


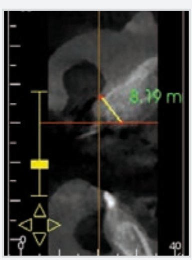
Patient 3 . 85% mineral volume in an area that is normally 35%. Minimal residual FDB, no remaining BPCS. Excellent result for long-term volume stability and osseointegration.

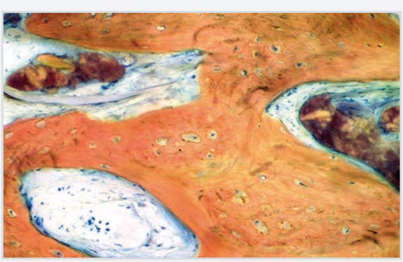


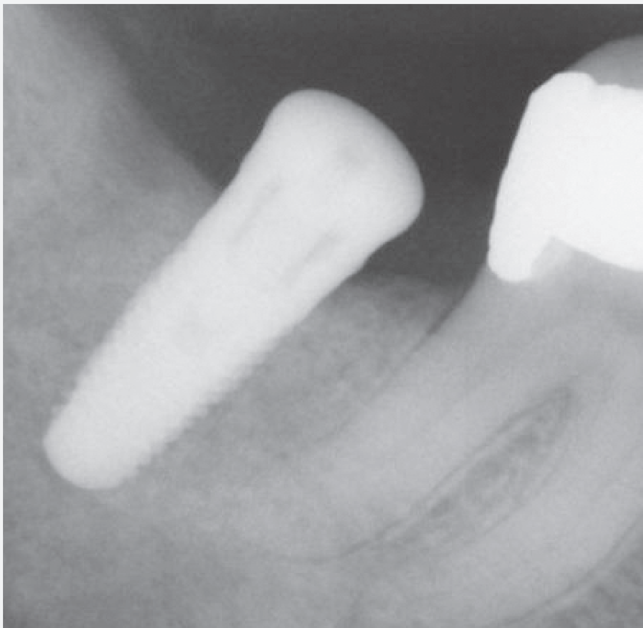


Patient 4 . All graft replaced with 65% bone, 100% vital, ridge width preserved after grafting.









10

A Multi-Center socket study on the bone forming capacity of calcium sulfate.

*A poster presented at the MIS Global Conference, Cannes 2013.

A Multi-Center socket study on the bone forming capacity of calcium sulfate.

Bindiya Kumari MDS[1], Ashish Jain MDS[2], Robert Horowitz DDS[3]

Introduction

Predictable bone regeneration is one of the goals of successful therapy at the time of tooth extraction. Numerous bone replacement graft materials have been used for this purpose. Some graft materials have shown either volume preservation or vital bone formation to some extent. One of these, the putty form of calcium sufate hemihydrate has shown promising results in the past and has additional barrier properties. This study was designed to compare two forms of calcium sulfate hemihydrate differing only in particle size. One is medical grade calcium sulfate hemihydrate with a particle size of 30 microns and the other is a nanocrystalline calcium sulfate hemihydrate with a particle size ranging from 400-800 microns.

Methods

The initial part of the multicenter study was conducted in the Department of Periodontology, H.P Government Dental College, Shimla from January 1st, 2011 to June 30th, 2012. Sixty sites were selected in patients in the age group ranging from 18-50 years. These were randomly divided into two groups of 30 sites each. Subject selection criteria included systemically healthy patients who were in need of extractions due to any ongoing pathosis i.e periapical radiolucency, periapical abscess etc. Subject with any of the following condition were excluded from the study. These were non compliant subjects, current smokers, medically compromised subjects, pregnant females and those on whom atraumatic extractions were not possible. Teeth were extracted under 2% xylocaine with (1:1,00,000) adrenaline. Then an intracrevicular incision extending from mesial to distal side of the tooth/teeth to be extracted and a conservative mucoperiosteal flap was raised. Careful tooth/teeth extraction was performed using a periotome and other necessary instruments, taking care to protect the surrounding alveolar bone. After socket debridement local control of bleeding from the extraction sites , granules was performed. At that point, depending on the randomization, either Nano crystalline calcium sulfate bone graft or medical grade calcium sulfate bone graft material were mixed with normal saline/ K2So4 and packed into the defect, filling it to ideal contour. After adequate condensation of the bone grafts, the previously raised flaps around the extraction site were closed with 3-0 silk sutures to secure the bone grafts in place. No attempt at primary closure was performed. No osteoprotective regenerative barrier was used as both the Calcium Sulphate bone grafts under study have self retentive properties and the gingiva will epithelialize over these materials.

Histopathological evaluation - Trephined cylindrical sample cores of newly formed intrasocket tissue, 2mm in diameter, 7mm in length, were obtained after 4 months of the surgical procedure. The core was fixed in 10% formalin and then transferred to different gradients of alcohol concentrations (70% Ethanol for 24hrs, 95% Ethanol for 24hrs, 100% Ethanol (x2)(48hrs). After dehydration, the sample was infiltrated and embedded in PMMA. Sectioning was performed with a low-speed saw microtome. The slide was ground and polished to a thickness of 100µm and then stained with haematoxyline and eosine and a few with mession trichome stain additionally. A slide scanner (Motis) was used to image the sample and image pro plus (ip-win) software was used for the histomorphometrical assessment of bone formation. Histomorphometrical analysis was conducted to quantify the amount of total vital bone and soft tissue present in the core. The results were compared in terms of the extent of resorption of the grafts with different particle sizes of calcium sulfate, the type and percentage of vital bone formed and the amount of soft tissue.

Intra-oral periapical (IOPA) radiograph was taken at baseline i.e immediately before the surgical procedure, 1 month, 3 months and 4 months after the surgical procedure to evaluate the Initial v/s final radiographic density of bone. The radiographs were taken by paralleling technique with the following parameters: The tube current of 8mA ,The tube voltage of 70 kV Length of the cone (PIG) 12 inches. All the radiographs were traced on a single sheet of X-ray tracing paper in terms of bone fill. The preoperative radiograph was used as a template from which the socket outline, the mesial and distal bone crestal levels (of the tooth to be extracted) and a reference line (which passes through the highest point of the adjacent teeth) are marked. Subsequent radiographs at 1month, 3 months and 4 months were then superimposed and bone fill was traced on the same X-ray tracing paper and bone fill was measured in millimetres from the most apical point towards the coronal point of the socket outline. The lowest level of bone fill was taken into consideration and the millimetres of bone fill was then converted in terms of percentage socket fill for every month. OPG-was taken preoperatively to measure the height of the alveolar ridge.

Results

Clinically and radiographically the volume of the extraction sockets was preserved well with both the grafts tested in this study. Average radiographic bone fill was 20% at 1 month, 50% at 3 months and 80% at 4 months, as shown in the graphs below. Vital bone was formed both where the calcium sulfate hemihydrate fully resorbed and in place of the nanocrystalline CS,w where graft remnants may still found after 4 months. The percentage of vital bone in the cases shown here ranged from 65–80%. This is significantly higher than most other studies in the literature, which show 25–35% bone with other grafts.

Conclusion

There is increasing interest in bone graft materials that stimulate bone formation rather than merely replace the lost volume. The use of nanocrystalline calcium sulfate or biphasic calcium sulfate (BONDBONE®) gives the surgeon advantages over a larger grain size

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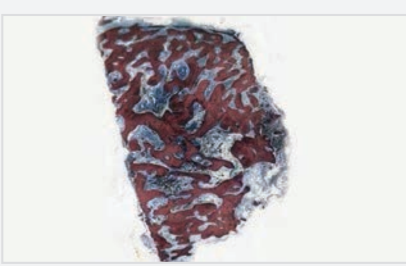
graft. The material sets to prevent graft washout. Significant biologic advantages include increased angiogenesis and more and quicker vital bone formation than conventional graft materials. Combining these characteristics makes any form of calcium sulfate an ideal addition to the armamentarium of the implant surgeon. This may be the most affordable "growth enhancer" we can use to increase the predictability of bone regeneration in extraction sockets. This approach to evaluation of graft healing can be used in all parts of the world where more advanced analysis tools are not available. Combining data between centers allows high level comparison of the results and confirmation of vital bone structure and formation with micro CT and non-demineralized histologic analysis. This method of analysis can be used around the world for other resorbable grafts or combinations including biphasic calcium sulfate (BONDBONE®).

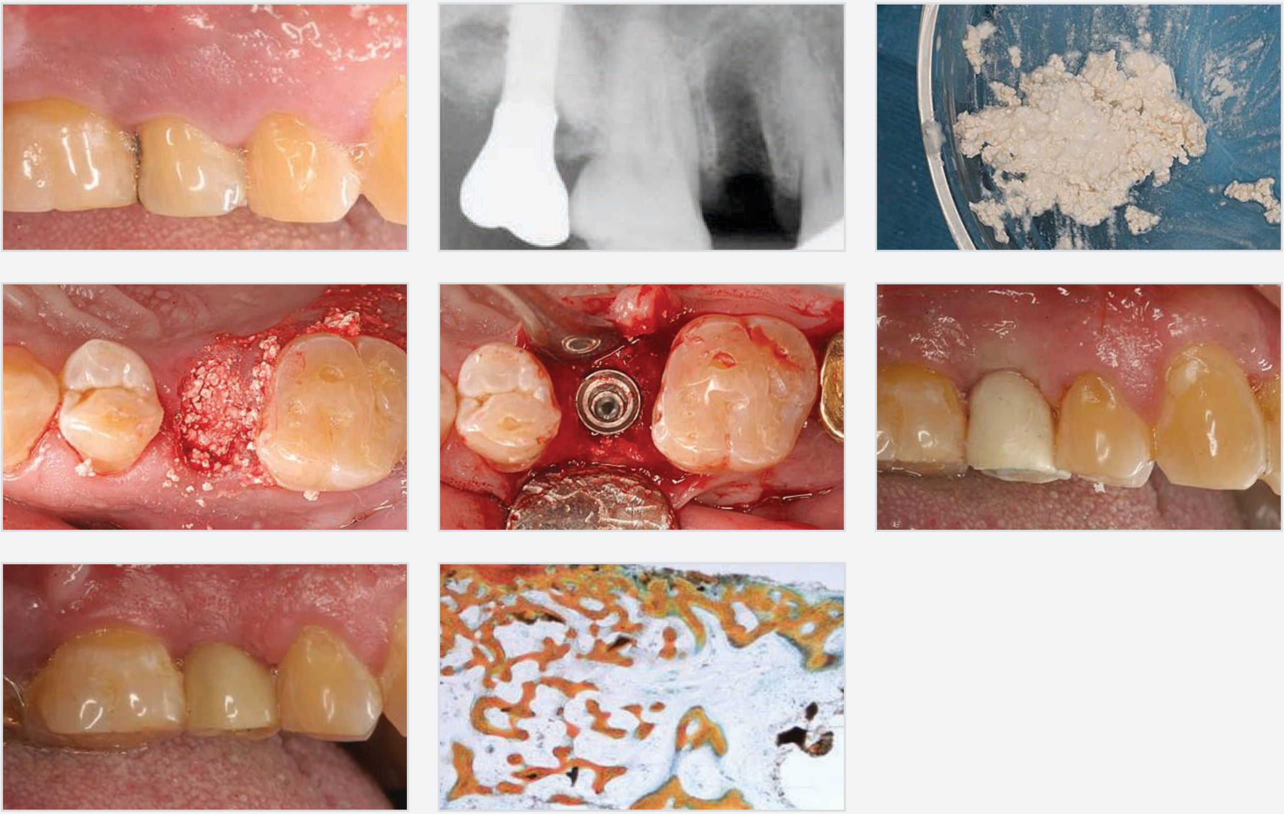
References

▪ Ziv Mazor, Robert Horowitz, John Ricci, Harold Alexander, Loana Chesnoiu-Matei. Sachin Mamidwar. The Use of a Novel Nano-Crystalline Calcium Sulfate for Bone Regeneration in Extraction Socket. Journal of Implant and Advance Clinical Dentistry 2011;3:1-12 ▪ Robert A. Horowitz, Michael D. Rohrer, MS,Hari S. Prasad, ZivMazor. Enhancing Extraction Socket Therapy. Journal of implant and advance clinical dentistry 2009:1(6);47-59 ▪ Rouble Kathuria, Nymphea Pandit, Ashishjain, Deepike Bali, Shipra Gupta. Comparative evaluation of two forms of Calcium Sulfate Hemihydrate for the treatment of Infrabony defects. Indian journal of dental sciences 2012;4(2)30-36 ▪ Gregory Gene Steiner. The healing socket and socket regeneration. Compendium of Continuing Education in Dentistry 2008;29(2):114-6 ▪ Ricci J, Alexander H, Nadkarni P, et al. Biological Mechanisms of Calcium Sulfate Replacement by Bone. Toronto, Canada: em squared Inc 2000 ▪ Walsh WR, Morberg P, Yu Y, et al. Response of a calcium sulfate bone graft substitute in a confined cancellous defect. Clinical Orthopaedics and Related Research. 2003;228–236 ▪ Ziv Mazor, Sachin Mamidwar, John L. Ricci, Nick M. Tovar Bone Repair in Periodontal Defect Using a Composite of Allograft and Calcium Sulfate (Dentogen) and a Calcium sulfate Barrier. Journal of Oral Implantology 2011;37:212-218.



The case demonstrated here is one of those where a tooth was removed by atraumatic extraction. In this study, teeth were removed with periotomes and elevators in general, Flaps were only elevated if required for debridement. After thorough debridement, in this case the area was grafted with the nanogen form of calcium sulfate. This area was allowed to heal for 4 months before reentry. A trephined core of bone was retrieved at the end of 4 months healing, at the time of implant placement and sent for histologic analysis. The non-demineralized histologic analysis shows 65% vital bone with no graft remnants. An abutment and crown were inserted 3 months after implant placement. A 3 year postop photo is shown.

Socket grafted with composite graft of BONDBONE®. MIS SEVEN® implant placed at 2 months, transitionally loaded 3 months later. Histology shows excellent vital bone Formation. No radiographic evidence of residual graft.

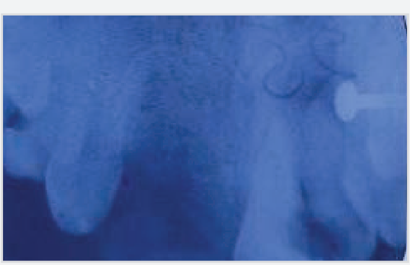


Manual calculations for the interpretation of radiographs.

Pre-operative

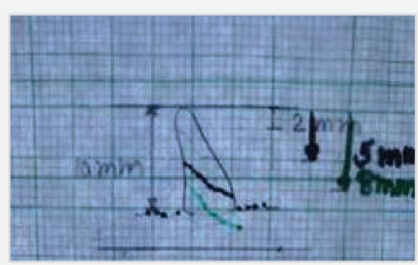
1 month post-operative

3 months post-operative



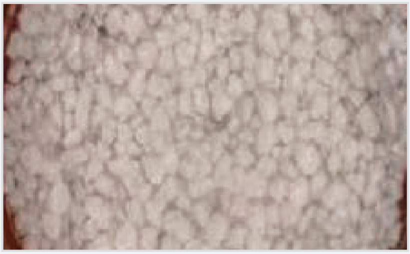
4 months post-operative

Tracings made on X-Ray tracing sheet

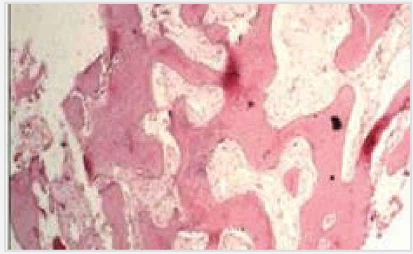


Amount of socket fill measured on grid

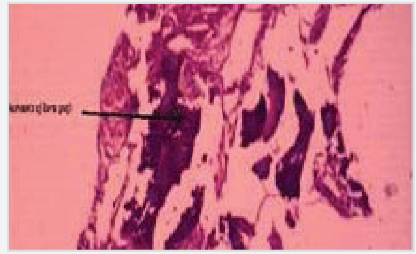
Calculations for % socket fill:
1 month - 2/10x100=20%
3 months - 5/10x100=50%
4 months - 8/10x100=80%



Biopsy Report for Nanogen.

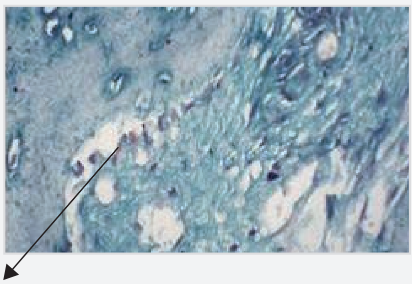


Histological slide showing newly formed Trabecular bone and soft issue with abundance of osteoblasts and osteocytes



Histological slide showing newly formed Trabecular bone and soft issue and bone graft remnants with abundance of osteoblasts and osteocytes

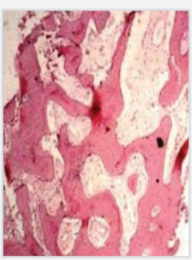
Biopsy Report for Nanogen with messon trichome stain at 40x.



Lining osteoblasts with red nueleus. The Newly formed bone is bluish green in color which can differentiate it from the parent bone.

Biopsy Report for Dentogen with H&E stain at 40x.

Lining osteoblasts with purple nueleus. The Newly formed bone is pink in color.

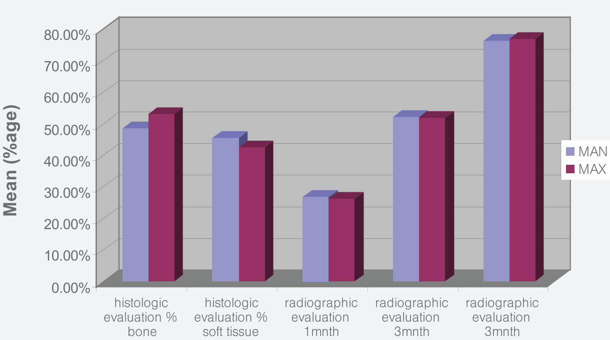


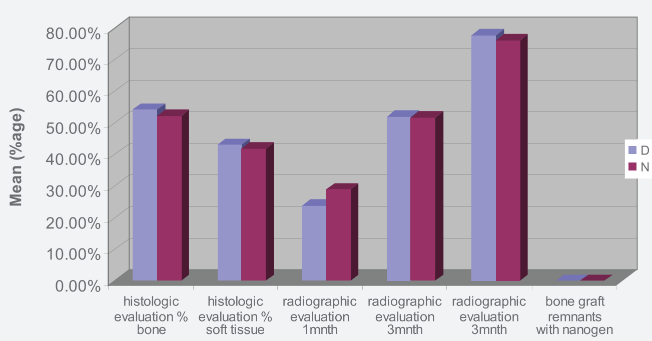
Life time image at 10x.

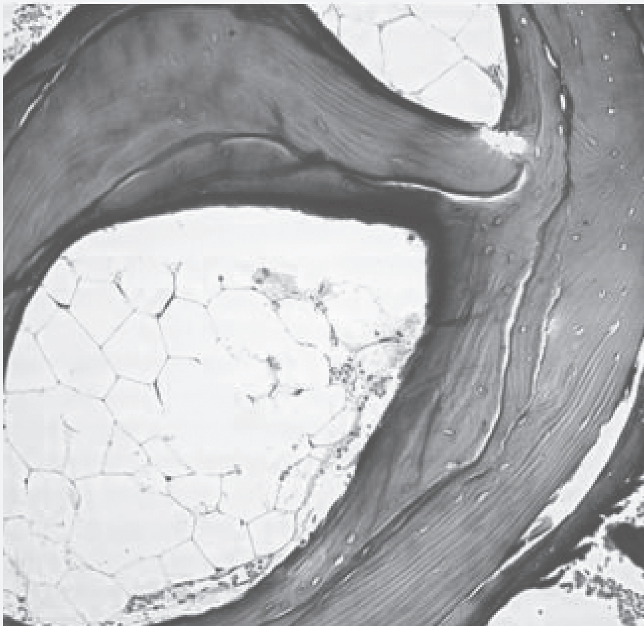
Putting red color to the bone.

Putting yellow color to the soft tissue.

Combining red and yellow color.







11

Prevention of infrabony pocketing after extraction of molar teeth with biphasic calcium sulfate.

*A poster presented at the MIS Global Conference, Cannes 2013.

Prevention of infrabony pocketing after extraction of molar teeth with biphasic calcium sulfate.

Robert A. Horowitz DDS; Huzefa Talib BDS, MFDRCS, FFDRCSI; Daniel Suto DMD*.

Abstract

To minimize side-effects after extraction including ridge collapse, ingrowth of connective tissue or epithelium in the alveolus. Augmenting fresh extraction sockets has become one of the most common surgical procedures. This technique is used frequently in anterior areas to preserve the crest for a delayed or immediate implant placement or prosthetic reconstruction. The extraction of third molars can cause remarkable osseous lesions, leading to periodontal defects, hypersensitivity and discomfort of the patient. Grafting of third molar sites with biphasic calcium sulfate is a functional treatment. It helps the preservation of the natural tissues and prevents or minimizes post operative complications including infection and bone loss on adjacent teeth.

Introduction

The high morbidity and limited availability of gaining autogenous bone led to a wide variety of alternative bone replacement graft materials. The aim of this study was a radiographic and clinical evaluation of Biphasic Calcium Sulfate (BPCS) grafted sites. The goals were to decrease postoperative infection and prevent periodontal involvement of the second molar after third molar extraction. Because of its abundant availability, low cost, angiogenic and osteogenic capabilities and its' ability to be rapidly and fully resorbed, many forms of Calcium Sulfate have become predictable graft materials in implant dentistry. The specific one used here, BPSC, is in an easy to deliver syringe and predictably sets in situ. A self-setting graft prevents some common intra-operative sequelae of molar extractions – bleeding (seen at 0.2 – 6%), sinus involvement and graft washout or clot breakdown which can lead to alveolar osteitis (reported at 0.3 – 26%). Other studies have shown that root planing, different flap designs and suturing techniques can positively influence the healing on teeth adjacent to impacted third molars. The authors in this study present a simple and reliable approach using BPCS to manage post extraction third molar sockets.

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Methods and materials

30 patients were selected to participate in this study. Patient inclusion criteria were systematically healthy patients, presenting one or more of the following symptoms: caries, pericoronal or periapical pathology, cyst formation or malangulation of their third molar teeth. Medically compromised subjects, smokers and pregnant females were excluded from the study. The third molars were extracted under local anesthesia after using a full thickness mucoperiosteal flap if needed for access. Immediately after removal the osseous defect was degranulated and filled with BPCS hydrated in sterile saline. The objective of this study was to evaluate the long-term results of radiographic bone density and post operative crestal bone to cementoenamel junction distance on the distal of the second lower molar and post operative comfort of the patients.

Results

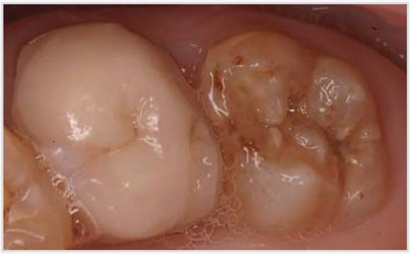
Common postoperative complications after third molar extraction include pain, swelling, dry socket formation, oro-antral communication, bleeding and pocket formation on the adjacent tooth. Using the techniques and materials shown here have resulted in fewer pain medications taken and no other complications. As the material acts as its' own barrier, primary closure was not attempted nor achieved in most cases. Even without an additional barrier, vital bone was formed as evidenced clinically, radiographically and histologically. The vertical bone height on the adjacent tooth surface remained unchanged. Keratinized tissue in the area was either preserved or augmented from this simple technique and biphasic calcium sulfate.

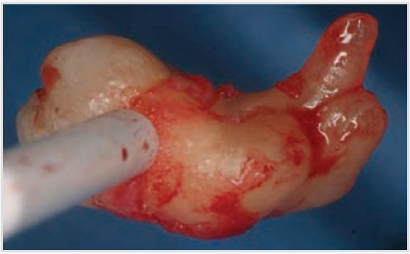
Conclusion

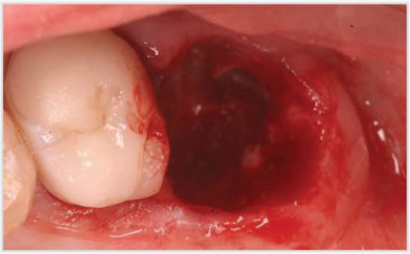
The patients in this study responded well to the extraction and grafting performed. When possible, instead of conventional rotary instruments, Piezosurgery was employed to enable atraumatic extraction. This decreased surgical trauma, improved visibility and used chilled, sterile saline instead of other irrigants. Combined with the grafting to eliminate dead space and improve vascularity, there were no dry sockets and no postoperative infections. The rapid bone fill in the socket enabled the full alveolar height to be restored, preserving the periodontal health of the adjacent tooth surface. These results were verified clinically, radiographically and histologically. This new, vital bone has maintained the keratinized tissue and bone levels for years.

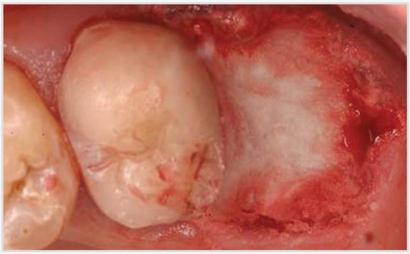
References

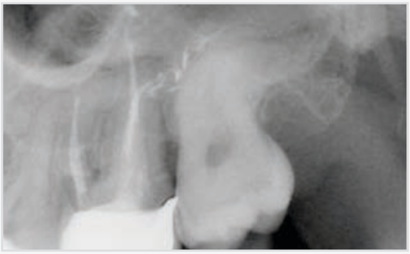
- Horowitz RA, Rohrer MD, Prasad HS, Tovar N, Mazor Z. Enhancing extraction socket therapy with a biphasic calcium sulfate. Compend Contin Educ Dent. 2012;33(6):420-6, 428.
- Haug RH, Perrott DH, Gonzalez ML, et al. The American Association of Oral and Maxillofacial Surgeons age-related third molar study. J Oral Maxillofac Surg 2005; 63:1106.

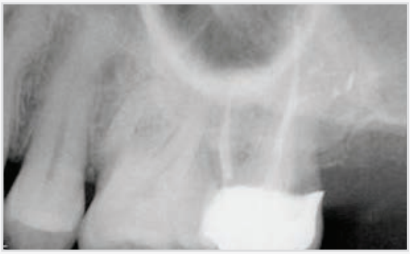




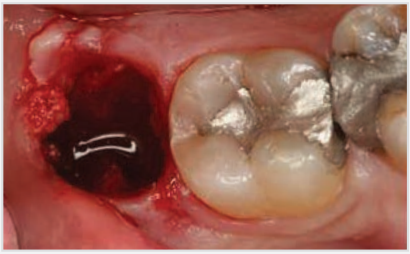


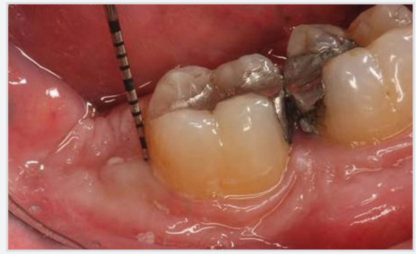
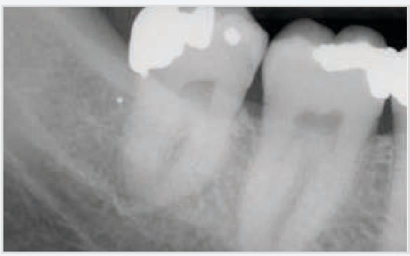
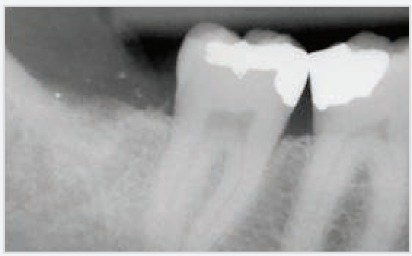


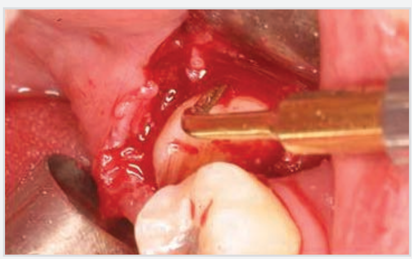


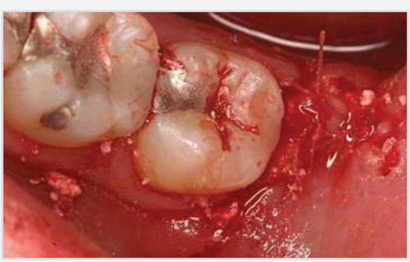




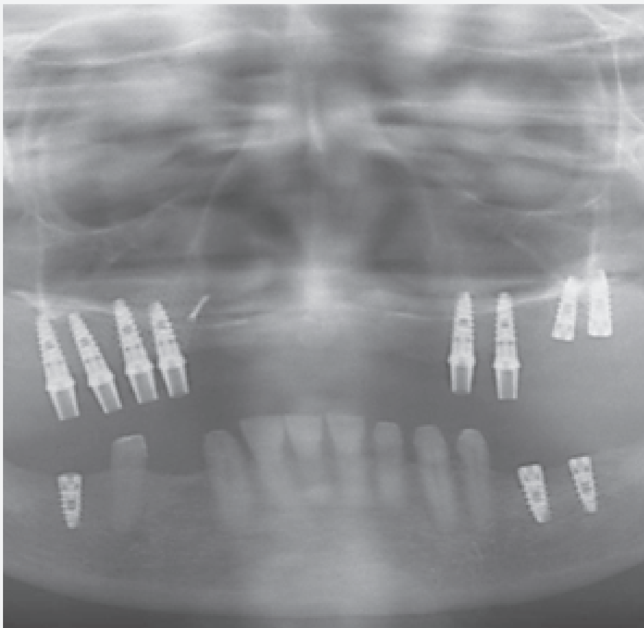







The patients shown here had third molar teeth removed with the assistance of Piezosurgery. In either a flapless or minimally invasive flapped approach, the teeth were extracted, sockets debrided and grafted with BONDBONE®, biphasic calcium sulfate. There was no primary closure either attempted or achieved. No membranes were used as BPCS has its' own barrier properties. As shown, the height of keratinized tissue and bone level were fully maintained by this approach between 18 months and 4 years after the surgical procedure. Where the postoperative sulcular depth was measured, it was 3mm or less on the distal surface of the adjacent tooth. This technique was well tolerated by the patients and simple to use with these materials.

The upper left second and third molar teeth were extracted in a flapless, atraumatic manner using Piezosurgery. The sites were debrided and grafted with BONDBONE®. No sutures nor additional barrier were needed or used. The sites healed uneventfully as seen in the 4-month periapical radiograph. At the time of placement of an MIS SEVEN® implant, the height and width of bone appear fully preserved. Clinically, a screw-retained crown was inserted 4-months later. Histologic evaluation of the retrieved bone core from the third molar site shows dense bone with vascular and marrow spaces. There is no evidence of any remaining bone graft material. This type of extraction and graft led to full bone preservation on the adjacent tooth surface to prevent future periodontal issues. There was also formation of ideal vital bone in the grafted area with no residual graft material for support of an osseointegrated implant with ideal keratinized tissue as seen in the 4-year post loading clinical photo.



12

Sinus floor augmentation with iliac bone grafts: a case report of full mouth rehabilitation.

*A poster presented at the MIS Global Conference, Cannes 2013.

Sinus floor augmentation with iliac bone grafts: a case report of full mouth rehabilitation.

Kun-Tsung Lee, DMD, MDS and Yi-Min Wu, DMD, PhD*

Introduction

The loss of teeth in the posterior maxillary area would affect masticatory function for patients and significantly impact their quality of life. The available bone was lost due to the downward expansion of the sinus floor after tooth lost. Over the past years, the reconstruction of edentulous areas with dental implants has been increasingly used. However, the use of dental implants was limited at bone level and quality in the residual ridge. A number of bone augmentation methods had been developed and sinus floor augmentation (sinus lift) was used to increase available bone and density with various bone graft types. Of these, the most biological materials with the highest rate of success were autogenous bone grafts. Bone grafting in the maxillofacial region has been used for a long time in oral and maxillofacial surgery. Various indications, donor sites, and techniques have been reported. Possible donor sites in the human body include the calvarial symphysis of the mandible, rib, iliac crest, and tibia bone.

Case report

We present a case of a 54 year old female patient attended our dental clinic, department of dentistry, Kaohsiung Medical University Hospital for implant and crown treatment due to the maxillary edentulous ridge and loss of bilateral mandibular molars (Fig 1.1-1.4). At first, we effectuated a major lifting of the maxillary sinus bilaterally with autogenous bone grafts from right iliac crest under general anesthesia (Fig 2.1-2.7). After 4 months, 3 implants (SEVEN®, MIS Implants Technologies Ltd, Bar Lev, Israel) were inserted into tooth numbers 35, 36 and 46 (Fig 3.1-3.2). To perform the positioning of implants placed in maxillary edentulous regions, a computerized tomography (CT) was requested to determine with greater accuracy the quantity of residual crestal bone (Fig 4.1-4.2). Then, 8 implants (SEVEN®, MIS Implants Technologies Ltd, Bar Lev, Israel) were inserted into 14, 15, 16, 17, 24, 25, 26 and 27 for immediate loading after an additional 4 months (Fig 5.1-5.6). After an additional 5 months of functioning with the temporary prosthesis, a permanent prosthesis in all-ceramics was fabricated (Fig 6.1-6.4). Now, this patient has normal masticatory function and keeps regular follow-up every 6 months (Fig 7).

*Department of Dentistry, Kaohsiung Medical University Hospital, College of Dental Medicine, Kaohsiung Medical University, Taiwan.


Fig. 1.1: Initial view of oral cavity (maxilla).


Fig. 1.2: Initial view of oral cavity (mandible).


Fig. 1.3: Frontal view with the upper complete denture.


Fig. 1.4: Initial panoramic X-ray imagination.

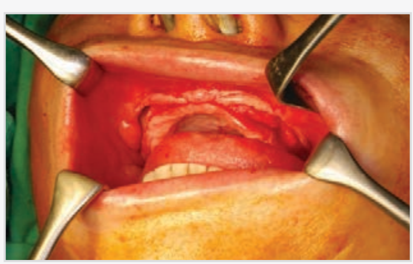


Fig. 2.1: Recipient site preparation under general anesthesia.


Fig. 2.2.1: Donor site (right iliac crest) preparation.


Fig. 2.2.2: Donor site (right iliac crest) preparation.

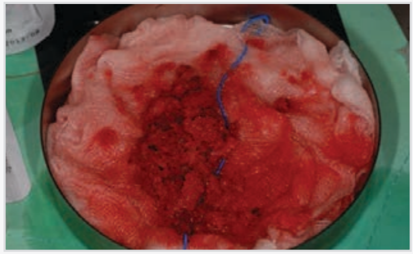


Fig. 2.3: Autogenous bone grafts from iliac crest.


Fig. 2.4: Right maxillary sinus lift (lateral window technique).


Fig. 2.5: Left maxillary sinus lift (lateral window technique).

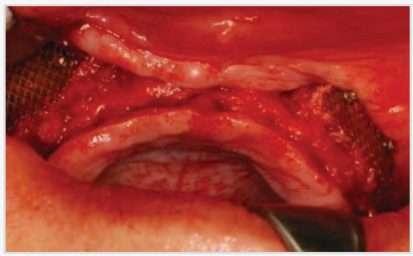


Fig. 2.6: GBR with titanium mesh and screw.


Fig. 2.7: Two weeks after bilateral sinus lift.


Fig. 3.1: One stage implant placement of 35, 36 and 46.

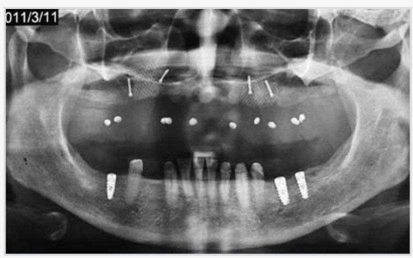


Fig. 3.2: Panoramic X-ray image.

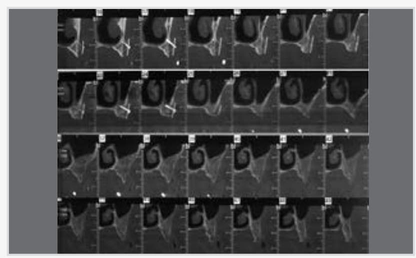


Fig. 4.1: Left maxillary CT image.

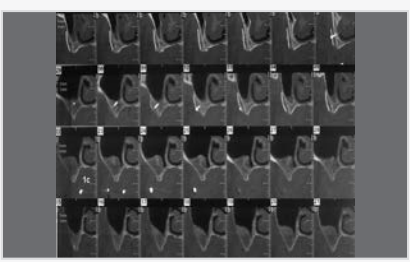


Fig. 4.2: Right maxillary CT image.

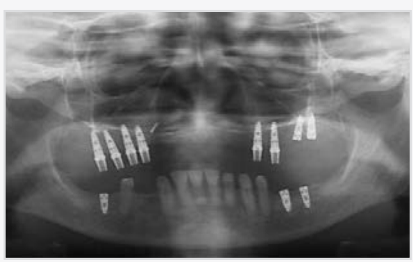


Fig. 5.1: Panoramic x-ray image of 14, 15, 16, 17, 24, 25, 26 and 27 implants placement.

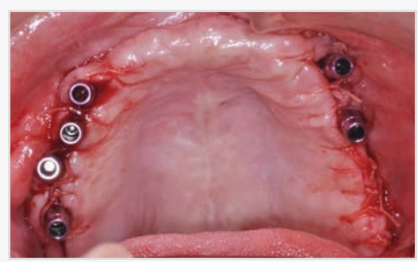


Fig. 5.2: Impression copings were fabricated for immediate loading after implants inserted.


Fig. 5.3: Work cast for temporary prosthesis.


Fig. 5.4: Temporary prosthesis from 17 to 27.


Fig. 5.5: Frontal view of temporary prosthesis.

Fig. 5.6: Occlusal view of temporary prosthesis.

Fig. 6.1: Frontal view of final all-ceramic prosthesis.

Fig. 6.2: Maxillary occlusal view of final all-ceramic prosthesis.

Fig. 6.3: Mandibular occlusal view of final all-ceramic prosthesis.

Fig. 6.4: Panoramic x-ray image of final prosthesis.

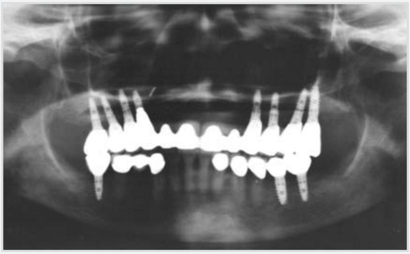
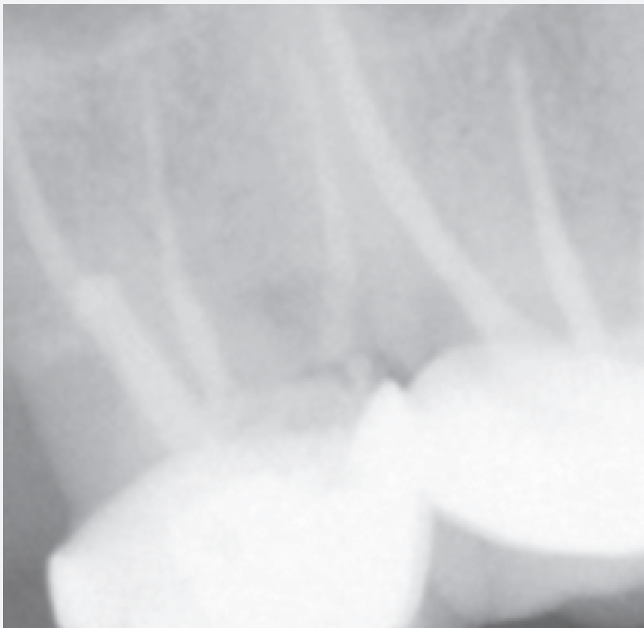


Fig. 7: Six months follow-up of panoramic x-ray image.



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Adjunctive treatment of periodontal disease with PERIZONE® PERIOPATCH®: case series.

*A poster presented at the MIS Global Conference, Cannes 2013.

Adjunctive treatment of periodontal disease with PERIZONE® PERIOPATCH®: case series.

David W. Paquette.*

Introduction

Periodontal disease (periodontitis) is a common inflammatory condition affecting the deep, supporting tissues around teeth. While specific bacteria in plaque biofilm initiate the disease process, host immuno-inflammatory responses are responsible for the majority of tissue destruction. Conventional methods for controlling periodontitis include mechanical removal of the biofilm (with or without surgical access) and the adjunctive use of chemotherapeutics (antimicrobials or host modulators).

The PERIZONE® PERIOPATCH® (Figure 1) is an approved device product that is broadly intended for the management of all types of oral wounds, injuries and ulcerations of the gingival and oral mucosa. The device is a self-adhesive hydrogel wound dressing that provides an absorptive and flexible barrier over the affected, inflamed gingival or mucosal area.

The PERIOPATCH® device is elliptical in shape (24mm x 8mm x 190μm) and is provided in a six-unit prescription dose pack PERIOPATCH® devices are made entirely of natural ingredients generally recognized as safe (GRAS), including an ethyl cellulose backing plus polyacrylic acid, castor oil, acacia gum, methyl hydroxypropyl cellulose, glycerol, strawberry flavor and the extracts from three plants (Sambucus nigra, Centella asiatica and Echinacea purpurea). Following application of PERIOPATCH® devices, the protective backing is shed after 2 hours. A hydrogel film remains for up to 5 hours, which is intended to reduce chronic wound fluid and the inflammatory burden (Figure 2).

Objectives

The aim of this case series was to document the adjunctive benefits of PERIOPATCH® therapy in patients with chronic periodontitis.

Materials And Methods

Three adult patients diagnosed with generalized moderate to severe chronic periodontitis were documented for this case series. One of the three patients (Case 1) also had type 2 diabetes mellitus but was medically controlled. Patients presented with at least two teeth with probing depth ≥6mm and that bled on probing at Baseline (Day 1).

Following a complete periodontal probing examination (Baseline), the three patients were treated with scaling and root planing. Patients applied PERIOPATCH® devices to identified areas of pocketing (≥6mm) twice on Day 1, then once daily for Days 2-7 and Days 15-21. Patients returned for a follow-up periodontal examination at 1 month.

Results

Clinical probing examinations performed at Baseline and 1 month post-treatment indicated consistent pocket depth reductions and clinical attachment level gains of 2mm on average and resolution of bleeding on probing. Patients complied with the application schedule, and reported no adverse effects.

Conclusion

Patients responded with consistent pocket depth reductions and clinical attachment level gains (2mm on average) and bleeding resolution at 1 month. Within the confines of this case series, the PERIZONE® PERIOPATCH® is a novel but simple device that may be combined with scaling and root planing for the management of chronic periodontitis.

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Fig. 1

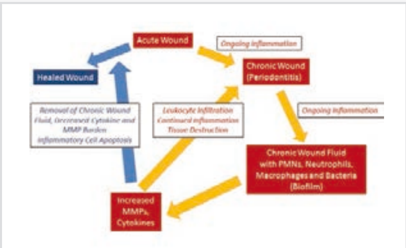

Fig. 2 Widgerow AD. Chronic wound fluid - thinking outside the box. Wound Repair and Regeneration 2011;287-291.

Case 1 . 58-year-old Caucasian female.
Intraoral and radiographic images of treatment teeth #11 (a, b), 29-30 (c, d). Application of PerioPatch to #11 facial (e).


Fig. 3a

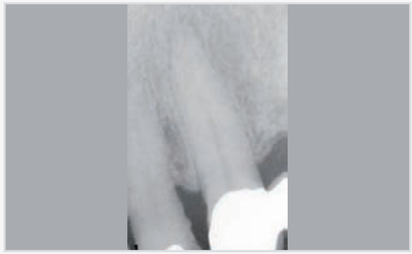
Fig. 3b


Fig. 3c

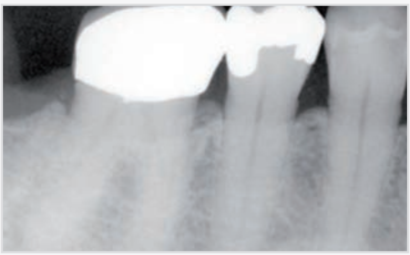
Fig. 3d


Fig. 3e

Baseline Probing Parameters and 4-Week Response

	Buccal	10	11	12
4W	CAL	222	422	-
	PD	222	422	-
BL(0)	CAL	332	632	-
	PD	322	622	-

	Buccal	30	29	28
4W	CAL	232	232	222
	PD	222	212	212
BL(0)	CAL	233	332	223
	PD	222	222	223

	Lingual	10	11	12
4W	CAL	223	422	-
	PD	223	434	-
BL(0)	CAL	323	525	-
	PD	322	525	-

	Lingual	30	29	28
4W	CAL	334	433	424
	PD	334	424	424
BL(0)	CAL	336	634	524
	PD	336	635	524

Case 2 . 60-year-old Caucasian male.
Panoramic radiograph (a) intraoral images of treatment teeth #14, 15 & 20 (b, c). Application of PERIOPATCH® to #14-15 facial (d)


Fig. 4a


Fig. 4b


Fig. 4c


Fig. 4d

Baseline Probing Parameters and 4-Week Response

	Buccal	13	14	15
4W	CAL	-	657	656
	PD	-	324	323
BL(0)	CAL	-	768	989
	PD	-	536	656

	Lingual	21	20	19
4W	CAL	323	232	232
	PD	323	323	232
BL(0)	CAL	423	323	334
	PD	423	323	333

	Lingual	13	14	15
4W	CAL	-	545	365
	PD	-	434	344
BL(0)	CAL	-	769	989
	PD	-	335	545

	Lingual	30	29	28
4W	CAL	334	534	565
	PD	334	423	423
BL(0)	CAL	545	746	656
	PD	535	635	533

Case 3 . 59-year-old Caucasian female.
images (a, b) and radiographic image of treatment teeth (c) #2-3. Application of PERIOPATCH® to #2-3 palatal (d).


Fig. 5a


Fig. 5b

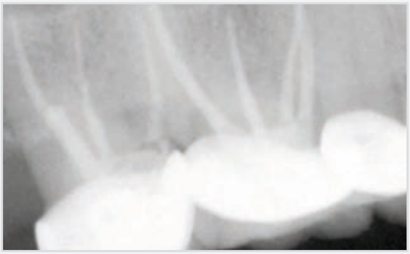
Fig. 5c


Fig. 5d

Baseline Probing Parameters and 4-Week Response

	Buccal	2	3	4
4W	CAL	242	332	222
	PD	222	322	212
BL(0)	CAL	443	432	423
	PD	324	532	423

	Lingual	2	3	4
4W	CAL	554	345	332
	PD	423	323	322
BL(0)	CAL	578	666	333
	PD	546	646	333

The MIS 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 products are cleared for marketing in the USA and CE approved.

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