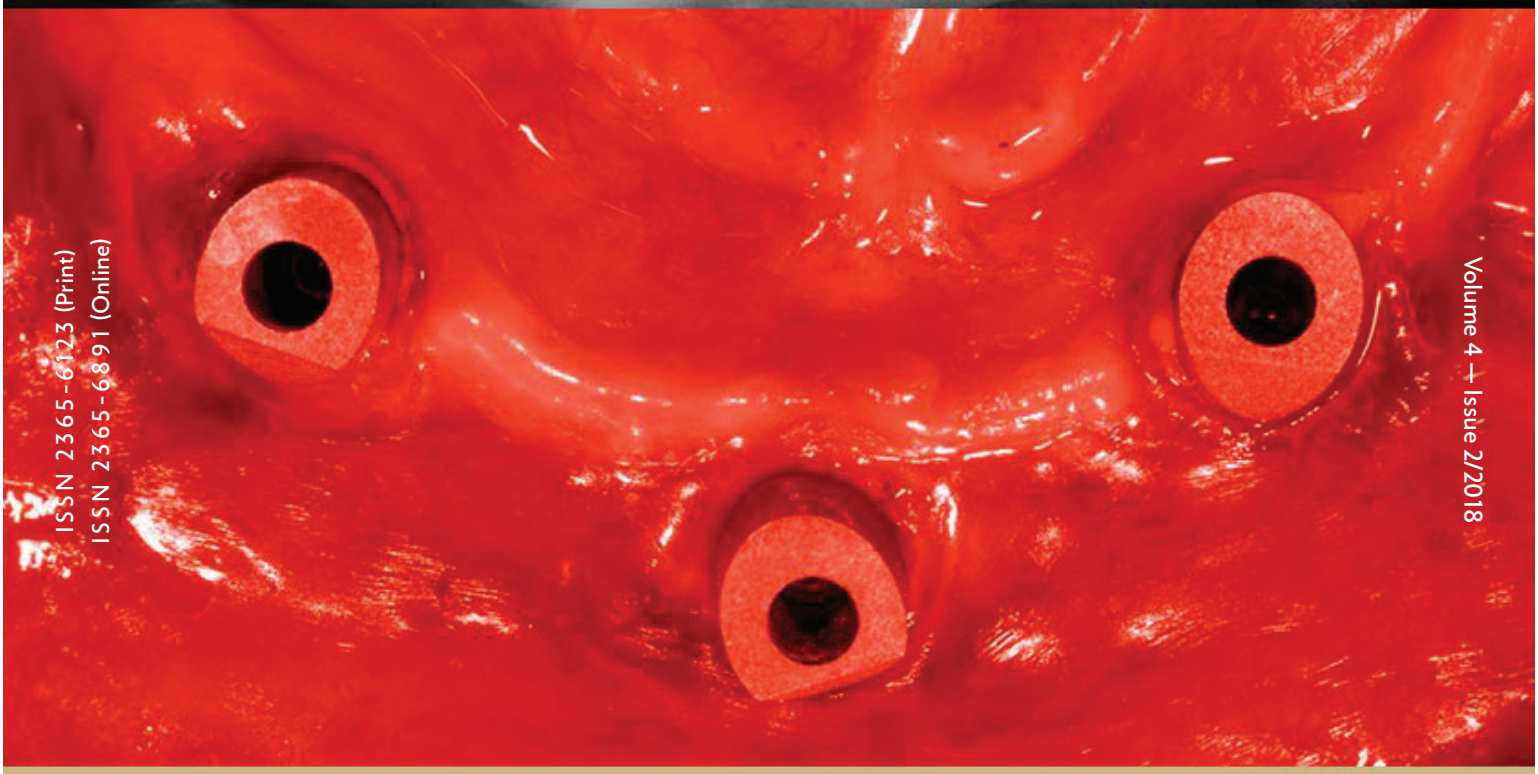
Journal of

Oral Science & Rehabilitation

Journal for periodontology, implant dentistry, dental prosthodontics and maxillofacial surgery



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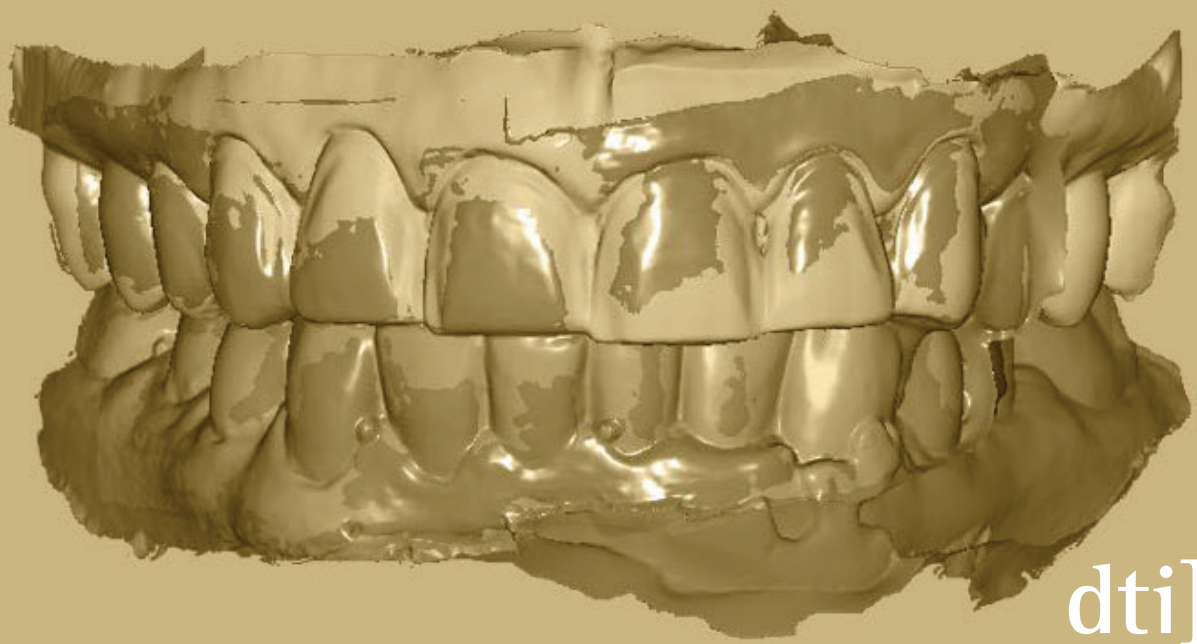

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Editorial

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Surface treatment of ceramics

In modern prosthodontic dentistry, metal-free ceramics are widely used materials, and knowledge of their unique cementation procedures is paramount for a modern dentist. In order to achieve optimal adhesion between teeth and ceramics, knowing the composition and properties of adhesives is not enough. It is important to know how dental tissue and the different ceramics interact with them, and how these substrates can be treated beforehand in order to achieve optimal results.

As technology has progressed, different types of ceramics have been introduced, such as feldspathic porcelain, leucite-reinforced ceramics, lithium disilicate and zirconia. These materials have similar esthetic properties, but different mechanical and chemical properties. The difference in properties between ceramics is directly related to their structural differences: The presence or absence of leucite crystals, the radically different shape of lithium disilicate crystals and zirconium oxide particles, and other features of ceramics directly influence the type of surface treatment needed to obtain an optimal chemical adhesion. Each material needs to be treated in a certain way before cementation, and knowing this could yield overall better clinical results.

Nowadays, sandblasting glass-ceramic surfaces (feldspathic, leucite and lithium disilicate) is not advised, because this kind of treatment could flatten them and create microfractures in the glossy matrix, leading to future failure of the restoration. A tribochemical treatment on zirconia using aluminum oxide particles, however, is advised; it increases surface roughness and augments chemical adhesion owing to the particles embedded in the zirconia's surface.

The gold standard for treating glass-ceramic surfaces is etching; however, for different ceramics, different etching times must be applied:
– For feldspathic ceramics, etching with 5% hydrofluoric acid for 120 s is advised.
– For leucite-reinforced ceramics, etching with 5% hydrofluoric acid for 60 s is advised.
– For lithium disilicate, etching with 5% hydrofluoric acid for 20 s is advised.
For zirconia, etching is not advised, as it has been demonstrated that its surface is rendered chemically inert by this treatment.

In conclusion, clinicians should feel compelled to research and study this subject in order to combine their knowledge of adhesive materials with the knowledge of chemical characteristics and best surface treatments for both the dental substrate and the restoration substrate.

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Dr. Vincenzo Marchio

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The *Journal of Oral Science & Rehabilitation* publishes original and high-quality research and clinical papers in the fields of periodontology, implant dentistry, prosthodontics and maxillofacial surgery. Priority is given to papers focusing on clinical techniques and with a direct impact on clinical decision-making and outcomes in the above-mentioned fields. Furthermore, book reviews, summaries and abstracts of scientific meetings are published in the journal.

Papers submitted to the *Journal of Oral Science & Rehabilitation* are subject to rigorous double-blind peer review. Papers are initially screened for relevance to the scope of the journal, as well as for scientific content and quality. Once accepted, the manuscript is sent to the relevant associate editors and reviewers of the journal for peer review. It is then returned to the author for revision and thereafter submitted for copy editing. The decision of the Editor-in-chief is made after the review process and is considered final.

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Guided bone regeneration around 1-stage nonsubmerged dental implants with periimplant bone defects: A retrospective case series study

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J Oral Science Rehabilitation. 2018 Jun;4(2):08–14.

Abstract

Objective

The aim was to evaluate the 3-year outcome of nonsubmerged dental implants with buccal periimplant defects treated with a guided bone regeneration technique in a 1-stage approach.

Method and materials

A retrospective chart review of consecutive patients treated with dental implants and bone regeneration at the time of implant placement, left nonsubmerged, and with a minimum follow-up of 3 years after implant loading was performed. Patients were treated between January 2005 and December 2009 at the Oral Surgery Unit of the University of Valencia, Valencia, Spain. The following variables were assessed: complications with the healing procedure, implant success (based on Buser et al.[22]), and periimplant marginal bone loss. Statistical analysis was performed applying Chi2 test, Spearman's test and the Mann-Whitney test, using alpha set at 0.05.

Results

A total of 50 patients (26 women, 24 men) with a mean age of 54.8 ± 13.6 years (range: 25–79) and 75 implants were included. Seventy-one dehiscences (average height: 1.97 ± 1.06 mm) and 4 fenestrations (average height: 2.75 ± 0.95 mm) were treated. Five membrane exposures were recorded (10%). After 3 years post-loading, the implant success rate was 94% and mean marginal bone loss was 0.50 ± 0.27 mm.

Conclusion

Despite the limitations of this study, a nonsubmerged approach in connection with guided bone regeneration to treat periimplant bone defects is a feasible option with few healing complications and a good prognosis.

Keywords

Guided bone regeneration; periimplant defects; dental implants; marginal bone loss; success rate; nonsubmerged.

Introduction

The application of guided bone regeneration (GBR) provides clinicians with the ability to place implants in areas of insufficient amounts of bone.[1] The 1-stage approach, using grafting material with or without membranes at the time of implant placement, has the advantage of shortening the total treatment time.[2] GBR utilizing a 1-stage procedure around submerged implants has been widely documented in humans[1, 3, 4] and animals.[5–7] Several experimental studies in animals on nonsubmerged immediate implants placed in extraction sockets with GBR indicated that bone regeneration around these implants was possible;[8–10] and clinical studies on humans confirmed these results with good long-term outcomes.[11, 12]

Defects from fresh extraction sockets are characterized by the maintenance of intact surrounding bone walls, which offer favorable conditions for regenerative processes. However, when dental implants are placed in narrow ridges, the lack of 1 or more walls leads to open defects, which are less favorable for the regenerative process, since the blood clot is less protected, grafted bone particles are more subject to displacement, and a membrane placed to cover the defect may collapse.[13] Despite the 1-stage approach having the advantage of shortening the total treatment time, different systematic reviews on clinical outcomes of GBR procedures to correct periimplant dehiscences and fenestrations show that in most of the included studies dental implants were left submerged. There are few studies on GBR around nonsubmerged implants for treating periimplant bone defects in narrow alveolar ridges.[14–19] The purpose of the present study was to evaluate the 3-year outcome of 1-stage nonsubmerged dental implants with buccal periimplant defects treated with a GBR technique and resorbable membranes.

Materials and methods

Patient selection

A retrospective clinical study was conducted of patients with a minimum of 1 dental implant demonstrating a dehiscence or fenestration bony defect with an exposed implant surface during implant placement and thus undergoing simultaneous particulate bone grafting with resorbable membranes and left nonsubmerged. Patients were treated between January 2005 and December 2009 at the Oral Surgery Unit of the University of Valencia, Valencia, Spain, and were monitored annually for a minimum of 3 years post-loading. The study was performed following the guidelines of the Declaration of Helsinki for human research. Surgical procedures were performed by the same surgeon with extensive experience in regenerative procedures. Patients were given full information about the surgical procedures and duly signed informed consent forms. Preoperative analysis included registering complete medical histories and performing clinical and radiographic examinations.

Subject and site inclusion criteria:
- Dental implant with a dehiscence or fenestration bony defect during implant placement treated with particulate bone graft and resorbable membranes.
- Nonsubmerged dental implants.
- Tooth/teeth at implant site extracted > 6 months previously.
- Rehabilitation with a fixed or removable implant-supported prosthesis.
- Age > 18 years.
- No relevant medical conditions.
- Nonsmoking or smoking ≤ 20 cigarettes/day (all pipe or cigar smokers were excluded).
- Follow-up for at least three years after prosthetic loading.

Subject and site exclusion criteria:
- Patients with systemic or local conditions contraindicating implant therapy (previous chemotherapy, previous irradiation of the head and neck region, active progressive periodontitis and/or immunosuppression).
- Pregnant or lactating patients.
- Sites with acute infection.
- Poor oral hygiene.
- Implants with sinus augmentation.
- Immediate implants or placed in bone with a recent extraction (< 6 months).
- Reimplantation.
- Implants placed in bone previously regenerated with bone grafting.
- Patients failing to attend follow-up visits.

The present study is reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology statement.[20]