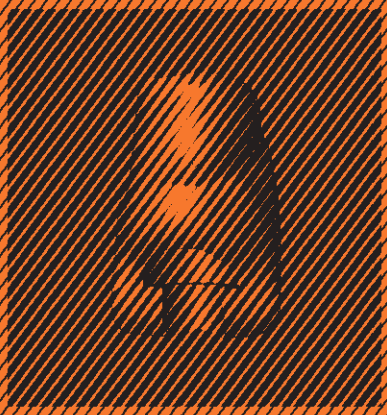
Journal of

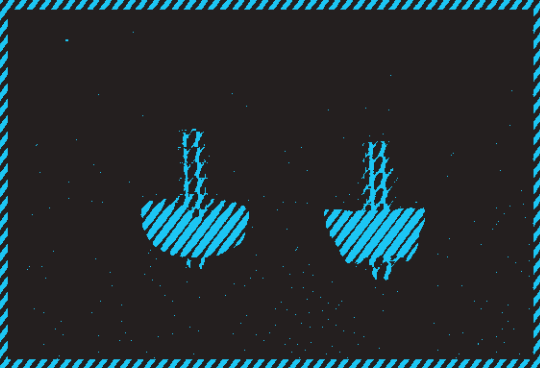
Oral Science & Rehabilitation

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



ISSN 2363-6173 (Print)
ISSN 2365-6891 (Online)

Volume 4 — Issue 4/2018



dti Dental Tribune International

Dental Tribune International

ESSENTIAL DENTAL MEDIA

www.dental-tribune.com

dti] Dental Tribune International

Editorial

Journal of

Oral Science & Rehabilitation

Apical periimplantitis: Diagnosis and treatment

Apical periimplantitis—also known as periapical implant lesions—develops in the tissues around the apex of an implant after placement, while the bone architecture in the coronal portion is maintained. If left untreated, this pathology eventually causes osseointegration failure. The diagnosis of apical periimplantitis is based on the clinical and radiographic findings. Clinically, early apical periimplantitis is characterized by symptoms (pain and tightness) and signs (swelling, fistula and drainage) of variable intensity, depending on the stage of the lesion. Clinically, the patient complains of pain and inflammation appearing, although in the early phase, there may be pain but not inflammation. Radiographically, a radiolucency around the implant apex may be observed (although it is not necessary—the same happens in acute periapical periodontitis, which may have symptoms without radiographic alterations). The use of new imaging technologies such as small-volume cone beam computed tomography is helpful in establishing an early diagnosis, showing a clear clinical image of periapical implant bone loss.

In the literature, there are few papers on diagnosing this disease and these lack homogeneity of diagnosis criteria. Diagnosis of apical periimplantitis involves clinical and radiographic evaluation, and the treatment will vary according to the findings:

a) If the implant has a radiolucent area (not present after surgery owing to overdrilling and manifesting over time) without pain, monitoring of the lesion is recommended, without medical treatment.
b) If the radiolucency has increased in size or if the patient develops pain, medical and surgical treatment are indicated.

Early diagnosis and management of active apical periimplantitis lesions (nonsuppurative phase with symptoms, acute suppurative and subacute phases) includes the surgical approach and its follow-up to evaluate the success of the treatment and avoid implant failure.

The literature describes medical and surgical approaches to treating periapical implant lesions. Medical treatment using antibiotics (amoxicillin, amoxicillin/clavulanate, metronidazole and clindamycin) alone has proved ineffective in controlling symptomatic or active lesions, and surgical access must be performed. There is no established gold standard treatment, so the goal is to eliminate the area of infection. Surgical treatment entails anesthesia, incision, full-thickness flap elevation, ostectomy, apical curettage and abundant irrigation. After debridement, some authors have described irrigation of the bone defect with saline solution or with chlorhexidine. Other agents have been suggested for local decontamination of the implant surface, such as chlorhexidine, calcium hydroxide paste and tetracycline pastes. There is no clinical evidence on the efficacy of any of these agents. Some studies describe the use of biomaterials, with or without membranes, in order to achieve complete bone regeneration of the defect. Resection of the apex of the implant is recommended in those cases where access for removal of the granular tissue is not otherwise ensured, likewise when there is an anatomical relationship with the maxillary sinus or nasal cavity.

Dr. Miguel Peñarrocha Diago
Editor-in-Chief

Content

Stay original. Trust in 10+ years of clinical experience.

~~NOBEL~~
~~ACT-IF~~

~~NOBEL~~
~~REPETITIVE~~

NOBEL ACTIVE

Nobel Biocare®

NobelActive®

10+ years of clinical experience
41 clinical studies
98.5% mean implant survival rate*
2,600+ patients evaluated
14,300+ implants clinically studied

* Up to 5 years of follow-up

Nobel Biocare. NobelActive® Over 10 years of clinical experience. Science First 2018, Volume 5, Issue 1.

About the *Journal of Oral Science & Rehabilitation*

The aim of the *Journal of Oral Science & Rehabilitation* is to promote rapid communication of scientific information between academia, industry and dental practitioners, thereby influencing the decision-making in clinical practice on an international level.

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.

About Dental Tribune Science

Dental Tribune Science (DT Science) is an online open-access publishing platform (www.dtscience.com) on which the *Journal of Oral Science & Rehabilitation* is hosted and published.

DT Science is a project of the Dental Tribune International Publishing Group (DTI). DTI is composed of the leading dental trade publishers around the world. For more, visit

www.dental-tribune.com

Benefits of publishing in the journal for authors

There are numerous advantages of publishing in the *Journal of Oral Science & Rehabilitation*:

– Accepted papers are published in print and as e-papers on www.dtscience.com; abstracts are published on www.dental-tribune.com.

–Authors' work is granted exposure to a wide readership, ensuring increased impact of their research through open-access publishing on www.dtscience.com.

–Authors have the opportunity to present and promote their research by way of interviews and articles published on both www.dtscience.com and www.dental-tribune.com.

–Authors can also post videos relating to their research, present a webinar and blog on www.dtscience.com.

Subscription price

€50.00 per issue, including VAT and shipping costs.

Information for subscribers

The journal is published quarterly. Each issue is published as both a print version and an e-paper on www.dtscience.com.

Terms of delivery

The subscription price includes delivery of print journals to the recipient's address. The terms of delivery are delivered at place (DAP); the recipient is responsible for any import duty or taxes.

Guided soft-tissue emergence profile techniques using CAD/CAM technologies: Multiple case reports

Christian Brenes[a] & Wally Renne[b]

[a] Department of General Dentistry, Dental College of Georgia, Augusta University, Augusta, Ga., U.S.
[b] Medical University of South Carolina, Charleston, S.C., U.S.

Corresponding author:

Dr. Christian Brenes
Department of General Dentistry
Dental College of Georgia
Augusta University
1120 15th St.
GC-3224
Augusta, Ga. 30912
United States

cbrenesvega@augusta.edu

How to cite this article:

Brenes C, Renne W. Guided soft-tissue emergence profile techniques using CAD/CAM technologies: Multiple case reports.
J Oral Science Rehabilitation. 2018 Dec;4(4):08–16.

Abstract

Objective

The following article describes 2 original techniques that use CAD/CAM technology to generate a pre-surgical healing abutment or provisional restoration.

Materials and methods

Two clinical cases are described using different techniques to create a guided soft-tissue emergence profile using a pre-surgical custom healing abutment or provisional restoration and their benefits. The first case describes the use of digital libraries with pontic emergence profiles. The 3-D object (tooth) is manipulated to replicate or to establish a natural contour that will determine the shape of the soft tissue during the healing process. The second technique describes the use of segmentation and mirroring of a natural tooth to generate an exact replica and emergence profile of the patient's dentition.

Conclusion

These techniques constitute a very simple and efficient way of generating a pre-surgical customized healing abutment or provisional restoration that allows the clinician to guide the soft-tissue healing process and emergence profile immediately after the surgery. The techniques are developed not to be software-specific, but rather to be used with any free or paid open architecture software.

Keywords

CAD/CAM; guided surgery; 3-D printing; segmentation; digital wax-up.

Introduction

Since 1989, Smith and Zarb incorporated appearance into the criteria for dental implant success.[1] Decades of evidence supports the importance of generating implant-supported esthetic restorations, with little attention to improving the soft-tissue emergence profiles or natural contours of the teeth.[2] Immediate provisional restorations are generally a good way to manage soft-tissue contours, aiding during the healing process with obvious esthetic benefits. Several authors have reported great results during decades of using traditional provisional techniques by minimally altering the biology of the soft tissue during the healing process.[3] The main limitation of traditional techniques is the chair time needed during or after the surgical procedure to fabricate such provisional restorations; when determining the efficiency of a protocol, the time factor is critical and most clinicians choose standard cylindrical abutments to guide tissue contours before the final impression. Abrahamsson et al. reported that subsequent disconnections and reconnections of abutment components might compromise the mucosal barrier, and this could lead to retraction or apically positioned connective tissue due to increased bone remodeling.[4] In addition, most cylindrical and unnatural emergence profiles could lead to food impaction and possible biological complications due to poor emergence profiles, food impaction and potential periimplantitis.

In the past, several authors described accelerated dental implant protocols such as immediate placement and immediate provisionalization.[2,5] Recently, some companies have developed anatomical healing abutments that, in contrast to custom healing abutments, have an anatomical shape based on average standardized healing profiles. Systems such as Contour Healer (Common Sense Dental Products), which are anatomical PEEK abutments that can be shaped, and the VPI EPI mold system (VP Innovato Holdings), which helps fabricate composite anatomical abutments from a silicone mold, are among the most popular systems. The limitations of using such analogue systems are reliance on the limited implant brands they are compatible with, the healing process not being guided from the emergence profiles of the final restoration or wax-up, and being able to fabricate healing abutments only, but not provisional crowns **(Figs. 1 & 2A & B)**.

The use of CAD/CAM technologies has offered different techniques to generate custom restorations. Most systems allow for the scanning of scan bodies after implant placement to generate an implant-supported provisional restoration, but this technique only allows the clinician to generate the provisional restoration after the surgery. The use of guided surgery in combination with pre-surgical customized healing abutments or provisional restorations with natural emergence profiles can provide the clinician with a very cost-effective and predictable way of replicating nature and minimizing soft-tissue trauma.

Two different techniques are described for the creation of a pre-surgical custom healing abutment or provisional restoration. The first case describes the use of digital libraries with pontic emergence profiles. The 3-D object (tooth) is manipulated to replicate or to establish a natural contour of a tooth. The second technique describes the use of segmentation and mirroring of a natural tooth to generate an exact replica and emergence profile of the patient's dentition.

Clinical case 1

A 52-year-old man presented to the Dental College of Georgia at Augusta University, Augusta, Georgia, U.S., with the chief complaint of 2 missing posterior teeth **(Fig. 3)**. During the first appointment, clinical and radiographic examinations were completed for proper diagnosis and formulation of treatment plan. The periodontal condition was stable, no endodontic lesions were found, and the patient reported good hygiene. After proper diagnosis, it was determined that the patient could be a candidate for dental implant therapy. Digital impressions were taken using the Medit i500 intraoral scanner (Medit), along with a CBCT scan. With the diagnostic information acquired, the data were imported into the free implant planning software used in this case (Blue Sky Plan, Blue Sky Bio) and the STL model aligned to the DICOM volume using match points **(Fig. 4)**.

The following steps describe the technique of using digital libraries for a pre-surgical custom healing abutment or provisional restoration:

1. A 3-D wax-up is fabricated in the implant planning software. In this case, the Brenes pontic library was used to recreate the natural emergence profile of the restorations **(Figs. 5A & B)**.