



ELSEVIER

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

British Journal of Oral and Maxillofacial Surgery xxx (2017) xxx–xxx

BRITISH  
Journal of  
Oral and  
Maxillofacial  
Surgery[www.bjoms.com](http://www.bjoms.com)

## Dimensions of hard and soft tissue around adjacent, compared with single-tooth, zirconia implants

K. Kniha<sup>a,\*</sup>, A. Modabber<sup>a</sup>, H. Kniha<sup>b</sup>, S.C. Möhlhenrich<sup>c</sup>, F. Hölzle<sup>a</sup>, S. Milz<sup>d</sup><sup>a</sup> Department of Oral and Cranio-Maxillofacial Surgery, University Hospital Aachen, Pauwelsstraße 30, Aachen 52074, Germany<sup>b</sup> Private Dental Clinic Drs Kniha and Gahlert, Theatinerstraße 1, Munich 80333, Germany<sup>c</sup> Department of Orthodontics, University Hospital Aachen, Pauwelsstraße 30, 52074, Germany<sup>d</sup> Department of Anatomy Munich, Ludwig-Maximilians University Munich, Pettenkoferstr. 11, 80336, Germany

Accepted 10 November 2017

### Abstract

Preservation or regeneration of the papilla has always been a challenge around consecutive implants or with implants next to teeth, and many studies have evaluated the papilla's behaviour and patterns based on surgical technique and prosthetic design, though evidence about its behaviour around zirconia implants is scarce. The aim of this study was to evaluate papilla behaviour between implants and teeth (tooth-implant group) and between consecutive implants (implant-implant group). Ninety patients with 122 zirconia implants (Straumann® PURE Ceramic Implant) were examined at the one-year follow up. We measured the effect of the distance: first from the base of the contact point of the crowns to the contact with bone at the implant site (D1); secondly, to the contact with the bone at the neighbouring tooth or implant site (D2); and thirdly on the papillary deficit (D3). In both the tooth-implant group and the implant-implant group, D1 and D2 correlated significantly with the papillary deficit (D3), whereas D2 was the major determinant factor (Spearman's rho = 0.60). In both groups, when D1 and D2 were <6 mm, the papilla was present every time. The papillary deficit was significantly greater in the tooth-implant group than in the implant-implant group (p = 0.048). We conclude that the ideal distance from the base of the contact point to the bone contact at the implant and to the bone contact at the adjacent tooth in both groups is <6 mm. The height of the bone on the teeth adjacent to implants has a significant impact on that of the papilla.

© 2017 The British Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

**Keywords:** Dental Implants; Esthetics; Gingiva; Papilla; Zirconia

### Introduction

Patients' demands for good aesthetic outcomes in rehabilitation with implants, particularly anteriorly, are increasing. Not only is osseointegration expected, but adequate height and quality of soft tissue around dental implants are both essential and expected. The emerging profile of the tooth, the colour and texture of the soft tissue, and the height of the facial mucosa are important factors in the aesthetics of

fixed implant-retained restorations.<sup>1</sup> Understandably, most patients do not settle for cosmetic deformities such as "black interdental triangles" with accompanying difficulties with speech or impaction of food.<sup>2</sup>

The predictable regeneration of the interproximal peri-implant papilla remains a complex challenge around implants. Most studies have investigated papillary behaviour between titanium implants, and between titanium implants and teeth. Because we know of no long-term results, we do not clearly understand whether different implant materials (such as zirconium dioxide (ZrO<sub>2</sub>)) achieve a better peri-implant mucosal response than titanium. Different authors

\* Corresponding author. Tel.: +49 2418088258.

E-mail address: [kkniha@ukaachen.de](mailto:kkniha@ukaachen.de) (K. Kniha).<https://doi.org/10.1016/j.bjoms.2017.11.005>

0266-4356/© 2017 The British Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

have assessed components that affect the presence or absence of the interdental papilla.<sup>1–4</sup> Peri-implant distances from the contact point of the crowns to (a) the alveolar crest, (b) the bone contact at the implant, and (c) the bone crest at the neighbouring tooth affect the height of the papilla. Delayed placement of a zirconia implant leaves a critical distance between the alveolar crest at the neighbouring tooth and the contact point of the crown that risks a visible papillary deficit of between 7–8 mm.<sup>5</sup> However, the effect of these measures on the incidence of the papilla between adjacent zirconia implants has not to our knowledge been studied.

Our aim was to evaluate the effect of vertical distances from the base of the contact point of the crowns to the bone contact at the implant (D1), and to the bone crest at the neighbouring tooth (D2), on the presence or absence of the interproximal dental papilla round zirconia implants in two groups: implanted teeth (tooth-implant group) and adjacent implants (implant-implant group).

## Patients and methods

The ethics committee of the University approved the protocol, and informed consent was obtained from all 90 patients who took part in the one-year follow-up assessment. This observational retrospective study was designed to comply with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement. Clinical research was in accordance with the Ethical Principles for Medical Research Involving Human Subjects, outlined in the Declaration of Helsinki. Patients were included during the time period August 2013–May 2015. Smokers were excluded. Zirconia monotype implants (Straumann® PURE Ceramic Implants with the ZLA® surface, Straumann AG, Switzerland, Basel) were used. The radiographic and clinical assessment methods were as described previously.<sup>6</sup> All measured distances (D1–D3) are shown in Fig. 1.

Measurements were made by one examiner on the mesial and distal side of each implant and included as separate cases in both groups. Each measurement was made three times using the mean value.

To measure the papillary deficit (D3), a photograph was obtained at a 90° angle to the interdental papilla (Fig. 2A). Before the photograph was taken the lowest contact zone of the crowns was marked with a thin copper wire. The evaluation of the papillary deficit was made using the score described by Kniha et al.<sup>6</sup> According to the papillary deficit, four groups were delineated by the papillary index: 1 = 0 mm, 2 = >0 – <0.6 mm, 3 = ≥0.6 – <2.0 mm and 4 = ≥2.0 mm deficit.

In a radiographic assessment, the distances from the base of the contact point of the crowns to the bone contact at the implant (D1), and to the bone crest at the neighbouring tooth (D2), were evaluated. The tip of the papilla was marked with a mixture of dental cement (Temp Bond, Kerr, Rastatt,

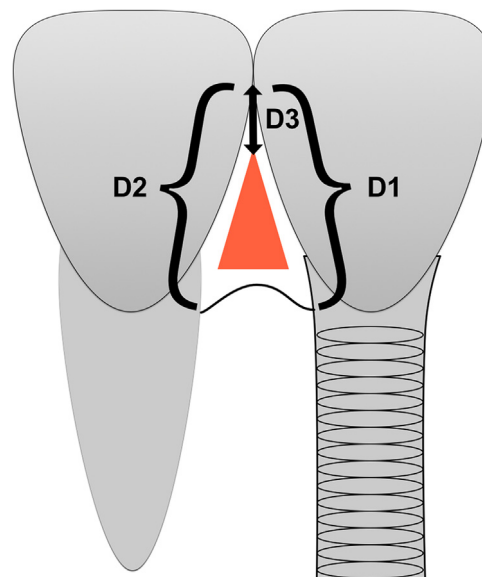


Fig. 1. Diagram of measured distances from the base of the contact point to the crowns to the contact of the bone and the implant (D1); to the contact of the bone at the neighbouring tooth (D2), and to the tip of the papilla (D3).

Germany) and tungsten powder in a ratio of 1:1 and was visualised on a standard parallel dental film (Fig. 2B).<sup>7</sup> The standard measurement was controlled in cooperation with a university clinic for prosthodontics.

## Statistical analysis

Statistical analyses were made with the aid of the software SPSS for Windows (version 22, IBM Corp, Ehningen, Germany) and STATA 13 (StataCorp, Texas, USA). Correlation of the data was established using Spearman's rho test. Values were considered to be “very weak” (0.00–0.19), “weak” (0.20–0.39), “moderate” (0.40–0.59), “strong” (0.60–0.79), or “very strong” (0.80–1.0).<sup>8</sup> Student's *t* test was used to assess the significance of differences between groups, and probabilities of less than 0.05 were accepted as significant.

## Results

Of 90 patients (48 women and 42 men; mean (range) age, 49 (20–80) years), 73 patients had 78 single gap implants and 17 patients had 44 adjacent implants. The tooth–implant group was compared with the implant–implant one (Table 1).

In the tooth–implant group, there was a moderate correlation between the distances from the alveolar crest at the implant to the base of the contact point D1 and the papillary deficit (index: 1 green = 0 mm, 2 light blue = >0 to <0.6 mm, 3 blue = ≥0.6 to <2.0 mm, and 4 red = ≥2.0 mm) (Spearman's rho = 0.48, *p* = 0.000). The length of D1 ranged from 2–14 mm. When D1 was <6 mm, the papilla was present every time (index 1).

Download English Version:

<https://daneshyari.com/en/article/8696823>

Download Persian Version:

<https://daneshyari.com/article/8696823>

[Daneshyari.com](https://daneshyari.com)