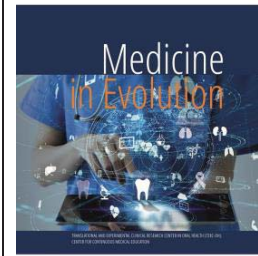# Correlations between the age of dental implants and color changes of the peri-implant mucosa

Ţandără A.[1], Funieru C.[1], Oancea R.[2], Preoteasa C.[3], Sluşanschi O.[1]

[1]*Department of Preventive Dentistry, Faculty of Dentistry, "Carol Davila" University of Medicine and Pharmacy, Bucharest*
[2]*Preventive, Community Dentistry and Oral Health Department, Faculty of Dental Medicine, "Victor Babeş" University of Medicine and Pharmacy, Timişoara*
[3]*Department of Scientific Research Methods-Ergonomics, Faculty of Faculty of Dentistry, "Carol Davila" University of Medicine and Pharmacy, Bucharest*

Correspondence to:
Name: Cristian Funieru
Address: Eforie Street, no. 4-6, district 5
Phone: +40 723286929
E-mail address: cristian.funieru@umfcd@ro

Abstract

Aim and objectives: The aim of the present study is to detect the presence of changes in the color of the peri-implant mucous membranes in a group of patients with implants supported dentures and to correlate these changes with the age of the dentures. Our study group consisted of 62 patients with one or more dental implants placed between 6 months and 5 years prior to the study. Data were collected by dental examinations and were photographically documented. Later, the data were introduced and analyzed in SPSS software, version 14.0. The correlations revealed that all patients with peri-implant mucosal discoloration had prosthesis placed in the previous 2 years. If these color changes are not a sign of peri-implant inflammation, we recommend evaluating them regularly to follow their evolution.

Keywords: implant, mucosa, color modifications

INTRODUCTION

The high frequency of implant supported dentures prosthetic treatments demonstrated over time an increase in the patient's life quality, but also led to an increased number of peri-implant diseases. Studies revealed a frequency of peri-implant mucositis up to 63.4% reported to patients and up to 30.7% reported to dental implants [1]. On the other hand, the frequency of peri-implantitis can reach up to 18.8% in relation to the carriers of dental implants and to 9.6% in relation to the number of implants. It is necessary to establish preventive protocols for the prosthetic treatments performed on dental implants in order to obtain good results.

Aim and objectives

The main purpose of this study is to establish a correlation between the age of implant-supported dental prosthesis and the color changes in the peri-implant mucosa in a group of romanian patients.

MATERIAL AND METHODS

The study group consisted of 62 patients recruited from 5 dental offices, 2 from the city of Bucharest and 3 from the city of Râmnicu Vâlcea. Every patient enrolled in this study signed the informed consent form.

A single examiner performed all dental check-ups for the 62 patients in order to avoid distortions (bias) that may occur when more clinicians must record similar data in a single file type [2].

Various data were collected, including the clinical aspect of the peri-implant mucous membranes, respectively color and volume. During this session, a series of photographs were also taken for each patient, focused especially on the level of implant-supported prostheses. The photographs were recorded on electronic media.

The color changes of the peri-implant mucosa were recorded by the operator during the dental check-ups and reviewed later based on the photographs.

The collected data were coded into the Microsoft Excel program. Later, they were imported and analyzed in SPSS 14.0. Apart from the simple statistical analysis, correlations were also calculated between the data recorded in the file in this study and the data collected through the clinical evaluation.

RESULTS

The analysis of the age of on implants-supported prostheses according to the recorded data is presented in Table 1.

Table 1. Age of dental implant prostheses

		Frequency	Percent	Valid percent	Cumulative percent
Valid	0-6 months	17	27.4	27.4	27.4
	6-12 months	14	22.6	22.6	50.0
	1-2 years	21	33.9	33.9	83.9
	2-5 years	9	14.5	14.5	98.4
	N/A (< 5 years)	1	1.6	1.6	100.0
	Total	62	100.0	100.0	

The analysis of color changes of the peri-implant mucosa is presented in Table 2.

Table 2. Clinical status of peri-implant tissues - color changes

		Frequency	Percent	Valid percent	Cumulative percent
Valid	No	42	67.7	67.7	67.7
	Yes	20	32.3	32.3	100.0
	Total	62	100.0	100.0	

The correlations between the age of dental implants-supported dentures in patients from the study group and the appearance of color changes in the peri-implant mucosa are presented in Table 3.

Table 3. Age of implant prosthesis * Clinical status of peri-implant tissues - color changes

			Color changes		Total
			No	Yes	
Age of prosthesis	0-6 months	Numerical value	11	6	17
		% from Age of prosthesis	64.7%	35.3%	100.0%
		% from Color changes	26.2%	30.0%	27.4%
	6-12 months	Numerical value	11	3	14
		% from Age of prosthesis	78.6%	21.4%	100.0%
		% from Color changes	26.2%	15.0%	22.6%
	1-2 years	Numerical value	11	10	21
		% from Age of prosthesis	52.4%	47.6%	100.0%
		% from Color changes	26.2%	50.0%	33.9%
	2-5 years	Numerical value	9	0	9
		% from Age of prosthesis	100.0%	.0%	100.0%
		% from Color changes	21.4%	.0%	14.5%
	N/A (< 5 years)	Numerical value	0	1	1
		% from Age of prosthesis?	.0%	100.0%	100.0%
		% from Color changes	.0%	5.0%	1.6%
Total		Numerical value	42	20	62
		% from Age of prosthesis	67.7%	32.3%	100.0%
		% from Color changes	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.476[a]	4	.050
Likelihood Ratio	12.284	4	.015
N of Valid Cases	62		

DISCUSSIONS

The highest percentage of dental implants with color changes of the peri-implant mucosa (result of the analysis) was in patients with an age of implant prostheses of one to two years. The lowest percentage with color changes, i.e., 0%, was found in patients with implant prostheses from 2 to 5 years old (Table 3).

The analysis of clinical signs specific to peri-implantation pathology, revealed that over 30% of patients showed color changes in the peri-implantation mucosa.

Most patients with color changes at the level of peri-implant mucosa (50%) have implant prostheses from 1-2 years old, followed (in order of frequency) by those 0-6 months old and those 6-12 months old. No patient with implant prostheses older than 2 years showed peri-implant mucosal color modifications.

These results showed us that the lifespan of implants for an extended period can be linked to the lack of peri-implant mucosal diseases [3] which is also dependent on the maintenance of good oral hygiene [4].

On the other hand, we must also consider the fact that in some cases the color changes of the peri-implant mucosa are not due to inflammatory causes, but to factors related to the type of implant, prosthetic abutment, prosthetic restoration, tissue augmentation, etc. [5]. Therefore, the presence of tissue inflammation cannot be confirmed (but it can be indicated) only by visual inspection of the tissues, but it must also be correlated with other clinical aspects such as values of microbial plaque and calculus scores [6], peri-implant probing depth and probing bleeding [7].

CONCLUSIONS

The high percentage (30%) of peri-implantation mucosal color changes makes us believe this is a problem which must be carefully and thoroughly investigated from two points of view: design and construction of implant prostheses and from the perspective of early detection of peri-implant inflammations to prevent their progression and complications.

The presence of color changes in the peri-implant mucosa should be a warning signal for every dentist.

If these changes do not represent a sign of peri-implant inflammation, we recommend an accurate recording of data and a strong photographic documentation in order to be able to follow them correctly.

REFERENCES

1. Atieh MA, Alsabeeha NH, Faggion CM Jr, Duncan WJ. The Frequency of Peri-Implant Diseases: A Systematic Review and Meta-Analysis. J Periodontol. 2013 Nov;84(11):158-98.
2. Stuckless S, Parfrey PS. Bias in Clinical Research. Methods Mol Biol. 2021;2249:17-34.
3. Nogueira-Filho G, Iacopino AM, Tenenbaum HC. Prognosis in implant dentistry: a system for classifying the degree of peri-implant mucosal inflammation. J Can Dent Assoc. 2011;77:b8.
4. Corbella S, Del Fabbro M, Taschieri S, De Siena F, Francetti L. Clinical evaluation of an implant maintenance protocol for the prevention of peri-implant diseases in patients treated with immediately loaded full-arch rehabilitations. Int J Dent Hyg. 2011 Aug;9(3):216-22.
5. Mancini L, Barootchi S, Thoma DS, Jung RE, Gallucci GO, Wang HL, Tavelli L. The peri-implant mucosa color: A systematic appraisal of methods for its assessment and clinical significance. Clin Implant Dent Relat Res 2023 Apr;25(2):224-240.
6. Paolantonio M, Perinetti G, D'Ercole S, Graziani F, Catamo G, Sammartino G, Piccolomini R. Internal decontamination of dental implants: an in vivo randomized microbiologic 6-month trial on the effects of a chlorhexidine gel. J Periodontol. 2008 Aug;79(8):1419-25.
7. Renvert S, Persson GR, Pirih FQ, Camargo PM. Peri-implant health, peri-implant mucositis, and peri-implantitis: Case definitions and diagnostic considerations. J Periodontol 2018 Jun;89 Suppl 1:S304-S312.