PERIODONTAL CHANGES IN CONJUNCT PROSTHESES

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Abstract:
Introduction. The treatment of reduced partially edentulous patients with gnatprosthetic bridges, linked to the organic substructure, determines on the gum's tissue many adaptive changes, related to the following factors: previous state of sulcular epithelium, quality of the finishing edges of the microprostheses, material from which the bridge is made, definitive cementing materials, etc.
The aim of our study is to assess the impact of the fixed prostheses upon the periodontal health.
Material and method. The study includes 112 patients (54 males and 58 females) with ages between 20-60 years. The evaluation was made on 282 conjunct prostheses. The statistical processing was made by the program STATISTIC (dedicated to medical research) and specific tests as ANOVA, Spjotvol/Stoline, Pearson, CHI – square (χ^2), Fisher, Spearman, etc.
Results. Periodontal changes appeared in 44.64% of cases. This aspect was correlated with different particularities of the prosthetic device. These can be taken into consideration as potential risk factors for periodontal changes. The study of periodontal health, related to the material that was used, showed a low prevalence in metal ceramic bridges (14.3%) and metal composite bridges (8.9%). Periodontal changes are more important in case of high amplitude and older bridges, and they are influenced by the material and the quality of their finishing. Although, there is a correlation between oral hygiene and periodontal changes of the prosthetic bridges patients.
Conclusions. Results show a close relation between periodontal changes and: the amplitude and age of the prosthetic bridges, quality of the finishing edges of the microprostheses, surface texture, axial and transversal adjustment and the materials used for the bridge and final cementation.

Key words: periodontal dieses, dental – periodontal joint, iatrogenic.

INTRODUCTION

The treatment of partially reduced edentulous patients with gnatprosthetic bridges, linked to the organic substructure, determines on the gum's tissue many adaptive changes.

A very important observation, regarding the prosthetic treatment of partially reduced edentulous patients, is that there is the highest iatrogenic risk. Only small mistakes (just a few millimeters) in the adaptation of prosthetic field and the manufacturing of the bridges may lead to dental pulp damages, pathological functions and periodontotic teeth, determining further teeth losses.

The aim of our study is to assess the impact of the fixed prostheses upon the periodontal health.

MATERIAL AND METHOD

The study includes 112 patients (54 males and 58 females) with ages between 20-60 years. The evaluation was made on 282 conjunct prostheses by clinical and paraclinical exams, mainly X-rays. The clinical evaluation of bridges includes the following parameters: the age and material of the bridge, the amplitude, axial and transversal adaptation, prophylactic modeling and periodontal modifications: gum retraction, periodontal bags, teeth mobility, bleeding index and hygiene status.

The statistical processing was made by the program STATISTIC (dedicated to medical research). We used also many other specific tests, such as: ANOVA, Scheffé, Spjotvol/Stoline, correlation tests for quantitative and qualitative data, such as: Pearson, CHI – square (χ^2), Mantel-Haenszel, Fisher, Spearman, Kendall tau, Gamma.

Lot's structure according to sex

The study lot presented a homogeneous distribution regarding the sex of the patients, 51.79% were females and 48.21% were men (fig. 1).

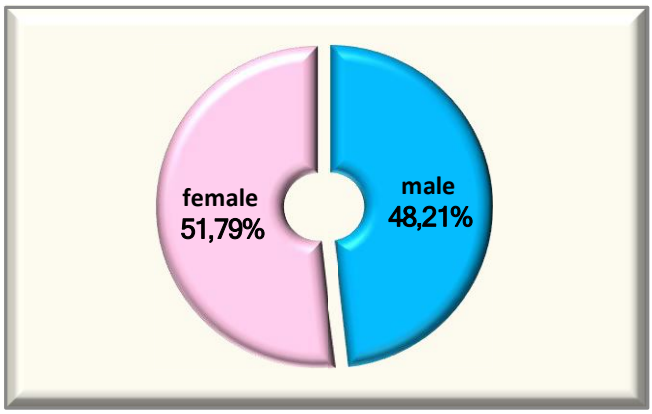

Fig. 1 Case distribution regarding the sex

Regarding the age, there was a high presence of 20 – 30 years old patients (62.5 %). A small presence had older patients, over 50 years (8.9 %) (Tab. I).

Age in the sample	No. cases	%
20< age <=25	40	35.71%
25< age <=30	36	32.14%
30< age <=35	10	8.93%
35< age <=40	6	5.36%
40< age <=45	6	5.36%
45< age <=50	4	3.57%
50< age <=55	2	1.78%
55< age <=60	8	7.14%
Total	**112**	

Tab. I Case distribution regarding the age

RESULTS AND DISCUSSIONS

The treatment of partially reduced edentulous patients with gnatprosthetic bridges, linked to the organic substructure, determines on the gum's tissue many adaptive changes. The tissue reaction depends on: previous gum status, quality of the finishing edges of the microprostheses, surface texture, axial and transversal adjustment and the materials used for the bridge and final cementation.

Periodontal changes were assessed according the case particularities, and appeared in 44.64% of cases. This was correlated to different particularities of the prosthetic bridge and which can be considered potential risk factors for the appearance of periodontal changes.

Correlations in periodontal changes. The material vs. periodontal changes. There is a significant correlation (tab. II) between the material and periodontal changes, especially for metalacrylic and metallic bridges (fig. 2).

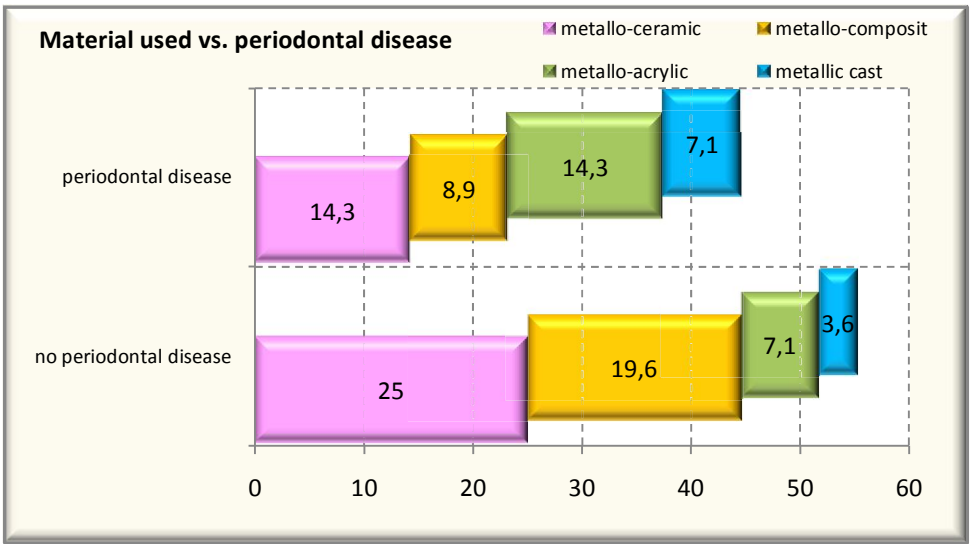

Fig. 2 Case distribution regarding the material

	Chi-square χ^2	df	p *95% confidence interval*
Chi-square - χ^2	10.60880	df=3	0.01404
ML Chi-square	10.71584	df=3	0.01337
Correlation coefficient (Spearman Rank R)	0.591549		0.01142

Tab. II Estimated parameters in the correlation between material and periodontal changes

The highest frequency in the study lot had metalceramic bridges (39.3%), followed by metalcomposite (28.6%), metalacrylic (21.4%) and metallic bridges (10.7%).

The amplitude of prosthetic bridge vs. periodontal changes

The study showed that periodontal changes occurred especially in 3 (12.5%) and 4 (14.3%) elements bridges (fig. 3).

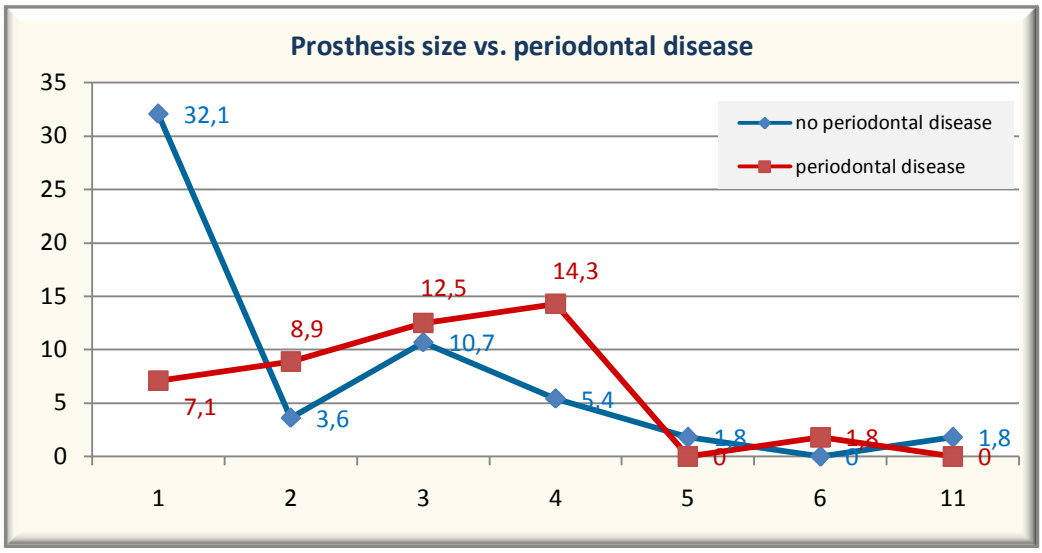

Fig. 3 Case distribution regarding the amplitude of prosthetic bridge vs. periodontal changes

The study demonstrated a significant correlation between the prosthetic bridge amplitude and periodontal changes. In one element bridges the changes occurred only in 7.1% of cases. In 3 and 4 elements bridges the changes increased significantly (r=0.51, p=0.001, 95%CI).

The age of prosthetic bridge vs. periodontal changes

The medium values of the age of prosthetic bridges depending on the changes were 10.4 months in the cases without modifications, and 51.5 months in the cases with periodontal changes (tab. III).

Periodontal disease	Mean Prosthesis age	Mean		Dev.std	Er. std	Min	Max	Q25	Median	Q75
		-95%	+95%							
Absent	10.4	2.4	18.4	31.4	4.0	0.2	240.0	1.0	3.0	7.0
Present	51.5	30.3	72.8	74.7	10.6	1.5	300.0	12.0	24.0	36.0
Total	28.8	17.8	39.7	58.6	5.5	0.2	300.0	2.0	7.5	24.0

Tab. III The age of prosthetic bridge vs. periodontal changes

Prosthesis age	**F** *(95% confidence interval)*	**p**
ANOVA test	15.42233	0.000150

Tab. IV Test for comparison of the medium values of the age of prosthetic bridges depending on the periodontal changes

Results of ANOVA test demonstrate significant differences between the medium values of the age of prosthetic bridges and the presence or absence of periodontal changes (p=0.00015, 95%CI) (tab. IV).

The anatomical restoration of prosthetic bridge vs. periodontal changes

The anatomical restoration of the tooth leaded to an absence of periodontal changes in 67.4% of cases. Contrary, 84.6% of cases without anatomical restoration presented periodontal modifications (fig. 4).

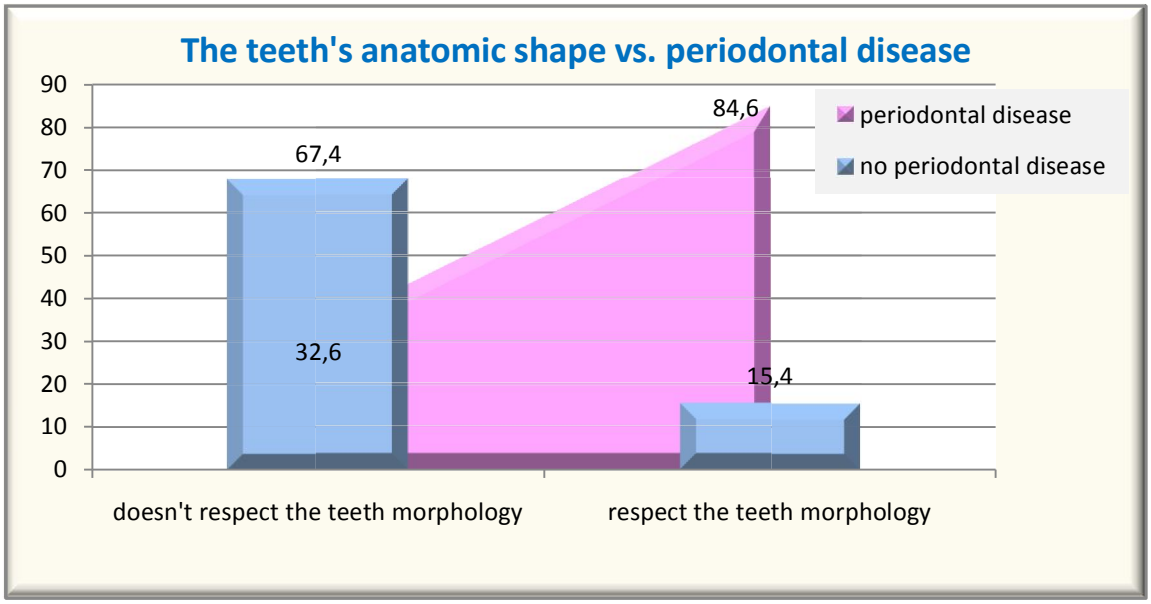

Fig. 4 Case distribution regarding the anatomical restoration of prosthetic bridge vs. periodontal changes

	Estimated value	*95% Confidence interval*	
		Minim	**Maxim**
Chance parameters			
Odds ratio (OR)	11.39	3.27	43.5
Risk parameters			
Relative risk (RR)	2.6	1.84	3.67
STATISTICAL TEST	**Chi-pătrat**		
Chi - squared (χ^2)	21.89		
p – significance level	0.0000029		
Correlation coefficient	0.838		

Tab. V Estimated chance and risk parameters depending on the periodontal modifications in the bridges without anatomical restoration

The lack of anatomical restoration of the teeth was taken into consideration as a risk factor for the contingent table (tab. V). Starting from here we calculated the chance and risk parameters depending on the periodontal changes. From this study we can notice that the chance ratio for periodontal changes is 11.39 (OR=11.39), which is a high risk for the patients with prosthetic bridges that do not respect the tooth anatomy to present periodontal changes (11.3 times higher then cases with anatomical restorative bridges). This parameter can increase up to a highest of 43.5 (OR=43.5).

The results show that any modification (rough edges of microprostheses, retentive spaces between margins and organic substructure) of the gum, which has a high predisposition to bacterial plaque, promotes quantitative and qualitative changes of the plaque. The modification of the plaque's ecology determines a local inflammation and a fast depth and surface spreading of bacteria. The presence in the bridges and cements of toxic and irritating materials will maintain and amplify the already existing inflammation.

CONCLUSIONS

The periodontal changes are in close relationship with: amplitude and age of the prosthetic bridges, quality of the finishing

edges of the microprostheses, surface texture axial and transversal adjustment and the materials used for the bridge and final cementation. These parameters are risk factors which will determine important periodontal modifications.

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