

INFLUENCE OF RESTAURATIVE THERAPY ON MARGINAL PERIODONTAL TISSUE

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ABSTRACT

The aim of this study is to evaluate the influence of fixed prosthodontics on the periodontal health status, emphasising the pathological changes induced by the restorative materials. **Materials and methods** The study group was made by 112 patients with 282 dental fixed bridges evaluated by clinical and paraclinical exams. The clinical evaluation included the age of the dental bridge, the material it was made of, the periodontal changes, the bleeding index. For the statistical processing of the data it was used STATISTICA, a special program for medical research. **Results and discussions** Periodontal changes consisted of significant values of periodontal bleeding index for 46.43% of the cases, periodontal pockets in 12.5% of the cases, recession in 3.57% of the studied cases. **Conclusions** There is a significant correlation between the material in use for the dental bridges and the presence of the periodontal damage, especially for the metal-acrylic and cast metal crowns.

Key words: fixed restorations, periodontal disease, dental biomaterials

INTRODUCTION

Treatment of partial edentation using a fixed prosthesis on abutment teeth can cause a series of adapting changes on the gingival tissues. Because of the features of the gingival sulcus the adapting reaction of this region will depend on the previous state of the epithelium, the finishing degree of the edges, the axial and transversal adaptation of the prosthesis and on the material type of which the dental bridge is made of and on the luting material [1].

Regarding the biological and prophylactic principle a dental bridge witch respects the state of health of the prosthetic field does not cause secondary lesions on the dento-periodontal support.

The purpose of this study is to evaluate the influence of fixed prosthodontics on the periodontal health status, emphasising the pathological changes induced by the restorative materials.

MATERIALS AND METHODS

The study group was made by 112 patients (54 men and 58 women), ages between 20-60 years old. There were evaluated 282 dental fixed bridges by clinical and radiographic exams. The clinical examination evaluated the age of the dental bridge, the material was made of, the periodontal changes, the bleeding index.

We run our data through STATISTICA, a special program for medical research. For the purpose of this study we used specific tests for each type of data such as ANOVA test, SCHEFFE test, SPJOTOVOL / STOLONE test, correlation tests for quantitative and qualitative variables such us Pearson, CHI square test, Mantel-Haenszel test, Fisher, Spearman, Kendall, Gamma test.

After using these tests the most important parameters were discussed and conclusions were drawn so p which was calculated in

those tests was compared to $p=0.05$, meaning a 95% value of trust, significant values meaning $p \text{ calculated} < 0.05$.

Describing the study group:

The structure based on the patient's gender:

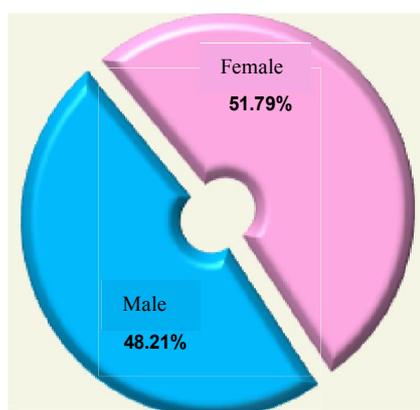


Fig. 1. Cases distribution based on gender

It is noticeable a heterogeneous distribution of the age factor, being encountered two ranges in the number of studied cases. Thus for 20-30 years old is found a maximum decreasing with the increasing age, and for 55-60 years old period there was a slight increase.

The mean age of the study group was 31.3 ± 10.6 DS, with a minimum for 16 years and maximum for 60 years. Quartile ranges show that 50% of the cases are aged up to 28

Age	F (95% confidence interval)	p
ANOVA test	3.699259	0.057

Table 2. Test for comparison of the mean age by gender

Cases	Age of dental bridge	Mean		Std. dev	Std. err	Min	Max	Q25	Med.	Q75
		-95%	+95%							
Male	16.3	11.9	20.7	16.0	2.2	0.4	48.0	2.0	12.0	24.0
Female	40.4	19.7	61.0	78.5	10.3	0.2	300.0	2.0	5.5	24.0
Total	28.8	17.8	39.7	58.6	5.5	0.2	300.0	2.0	7.5	24.0

Table 4. Statistical indicators of age according to patient's gender (in months)

The study group had a homogenous distribution regarding the patients' gender, 51.79% being women and 48.21% men (Fig. 1). Regarding the patients' age, 62.5% were aged between 20-30 years and 8.9% were age higher than 50 years (Table 1).

Ages	Cases	%
20 <=25	40	35.71%
25 <=30	36	32.14%
30 <=35	10	8.93%
35 <=40	6	5.36%
40 <=45	6	5.36%
45 <=50	4	3.57%
50 <=55	2	1.78%
55 <=60	8	7.14%
Total	112	

Table 1. Cases distribution based on age

years.

Material used for dental bridges

For making dental bridges were use metal-ceramic material, metal-composite material and metal for cast crowns. In the study group the metal-ceramic bridges presented the highest share (39.3%), than the metal-composite bridges (28.6%), metal-acrylic bridges 32.1% and 10.7% cast metal crowns (Table 3).

Material used	No cases	%
Metal-ceramic	44	39.3%
Metal-composite	32	28.6%
Metal-acrylic	24	21.4%
Cast metal crown	12	10.7%
Total	112	

Table 3. Cases distribution based on material type

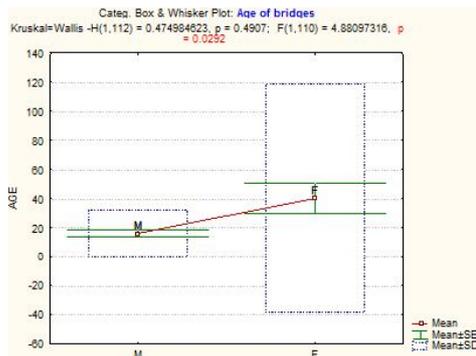


Fig. 2. Age of dental bridge according to patients' gender (in months)

We compare the age of the dental bridge based on patients gender, the conclusion we drawn being that there are significant differences between genders, for men the average value being lower than for women.

The age of the dental bridges

The average age was 28.8 months, with a minimum of 2 months and a maximum of 25 years.

RESULTS AND DISCUSSIONS

By definition Periodontitis consists in loss of epithelial attachment and reducing bone support, often accompanied by bleeding gums. Disease characteristics are assessed by means of expressing gingival bleeding index, gingival retraction, presence of periodontal pockets and radiographic bone loss.

Gingival bleeding index

An important factor in assessing the periodontal damage was the bleeding index. The bleeding index had important values for 46.43% of the cases from the studying group (Table 5). [3]

Periodontal pockets - analysing the dental bridges 12.5% of them presented periodontal pockets (Table 6) [2].

Gingival retraction - was present for 3.57% of the cases (Table 7), [2].

Correlation in periodontal damage

Dental bridge material vs. periodontal damage

Bleeding index	cases	%
0	60	53.57%
1	32	28.57%
2	20	17.86%
Total	112	

Table 5. Cases distribution based on bleeding index

	Cases	%
Absent	98	87.5%
Present	14	12.5%
Total	112	

Table 6. Cases distribution based on periodontal pocket

Dental bridges aggregated on organic structures as treatment for partial edentation is inducing a series of adaptive changes in the gingival tissues. Acrylate is known to induce irritation on marginal periodontal tissues due to the residual monomer, because it can't be finished very well and favours plaque retention while ceramic masses are biocompatible and very well accepted by the periodontal tissues [4, 6].

There is a significant correlation between the material in use and the presence of periodontal damage especially for acrylic bridges or cast metal crowns (Table 8, 9). [5]

Dental bridge age versus periodontal damage

The average values for the age according to periodontal damage were 10.4 months in case of absent damage and 51.5 months for the presence of periodontal damage.

Results for ANOVA test show significant differences between the average values for dental bridge's age in case of periodontal damage / in absence of periodontal damage (p=0.00015, 95%CI) (Tables 10, 11).

Clinical trial on 282 dental bridges for 112 patients showed that:

Periodontal changes were highlighted by periodontal bleeding index, with significant values for 46.43% of the cases, by periodontal pockets in 12.5% of the cases, by recession in 3.57% of the studied cases.

Gingival retraction	cases	%
Absent	108	96.43%
Present	4	3.57%
Total	112	

Table 7. Cases distribution based on gingival retraction

Metal-ceramic	28	25.0%	16	14.3%	44
Metal-composite	22	19.6%	10	8.9%	32
Metal-acrylic	8	7.1%	16	14.3%	24
Crown metallic	4	3.6%	8	7.1%	12
Total	62		50		112

Table 8. Cases distribution based on material vs. periodontal damage

	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

Table 9. Estimated parameters in association testing material vs. periodontal damage

Periodontal damage	Age of dental bridge	Media		Dev. std	Er. std	Mi n	Max	Q25	Media n	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

Table 10. Statistical indicators for dental bridge's age correlated with periodontal damage

Dental bridge age	F (95% confidence interval)	p
ANOVA test	15.42233	0.000150

Table 11. Test comparing the mean values for dental bridge's age depending on the presence of the periodontal damage

CONCLUSIONS

1. There is a significant correlation between the material in use for the dental bridges and the presence of the periodontal damage, especially for the metal-acrylic and cast metal crowns.

2. The average values for the dental bridges' age according to the presence of the periodontal damage were 10.4 months in case of absence of damage and 51.5 in case of presence of damage.

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