



Reasons for Patient's Dissatisfaction with the Design of Complete Denture Base

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ABSTRACT

Introduction: The successful recovery of the aesthetics is of vital importance for patient's satisfaction with complete dentures. Despite the opportunities provided by the modern dental technologies, the significance of denture base aesthetics is frequently neglected. The aim of this research is to analyze patient's satisfaction with the aesthetic characteristics of complete denture base and to find out whether the design of the complete denture has been created with participation of the patients.

Materials and Methods: 105 patients (59 women and 46 men) who have been using complete dentures for more than 1 year were inquired. A questionnaire was created that includes questions about patients' opinion about various aspects of reproducing the soft tissues via the denture base and whether their preferences were taken into account. Statistical data analysis was performed and chi square analysis was used to determine the associations with level of significance $p < 0.05$.

Results and discussion: The most of patients (70%) report that the doctor of dental medicine didn't discuss aesthetical issues in order to clarify his or her preferences. The reasons behind patients' dissatisfaction are unsuitable denture base color, insufficient correction of soft tissues' position and the shaping of the denture base in the visible area.

Conclusion: Considerable numbers of patients (43.81%) do not approve the denture base appearance and believe that this impacts negatively the aesthetic effect of prosthetic treatment. The opportunity for determination in detail of the denture base characteristics is frequently omitted. The achievement of optimal aesthetic results requires patient's informed participation.

Keywords: Aesthetics, Characterization of denture base, Complete dentures, Patient's satisfaction

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INTRODUCTION

The recovery of patient's aesthetical appearance after complete teeth lose is among the important tasks to be resolved in the case of complex rehabilitation of masticatory system. Patient's satisfaction from the prosthetic treatment with complete dentures greatly depends on the successful performance of this task [1]. Oftentimes, patient's expectations are higher than satisfaction after placement of the dentures [2, 3].

According to Chen, et al. [4] 36.7% of the researched people are not happy with their complete dentures and one of the reasons is the inadequate communication between doctor and patient. The reasons behind this effect most often could be found in the lack of patients' awareness of the opportunities for complete dentures characterization in view of his or her preferences. The methods for communicating with the patient are essential to clarifying his or her requirements and opportunities for their implementation [5]. The dental doctor should provide the patient with adequate information in accessible and understandable manner [6, 7]. This way, we could avoid the unrealistic expectations and easily achieve foreseeable result from the prosthetic treatment. The evaluation of dentures from aesthetic point of view depends on numerous factors such as age, sex and education [8]. Men demonstrate higher satisfaction from complete dentures and disapproval of the aesthetic indicator is found most often in the case of

women [9, 10].

When it comes to aesthetic requirements towards complete dentures, more and more patients are willing to personalize the construction so that it approximates as close as possible the natural dentition. The concept of complete dentures' natural appearance is very popular and there is agreement in the dental literature on its applicability [11]. In this regard, most often are discussed issues related to the selection of color, shape and size of teeth and their arrangement. Nevertheless, in order to achieve satisfactory aesthetic effect, we should define suitable characteristics of the denture base, especially in the vestibular sections of the maxilla [12,13].

The changes that occur in the facial appearance after complete tooth lose are clarified in detail [14]. It is essential to achieve adequate recovery of lip and cheek position with the aid of the complete dentures. For this purpose, we should model the base in the vestibular area in order to prepare it with suitable thickness for each and every particular patient whereas meanwhile we should maintain the aesthetical balance with the dental composition. The characterization of complete dentures could be performed with individually coloring or shaping along the vestibular surface of the features of soft tissues [15-17].

The pattern application of a single universal color in all cases does not provide the opportunity to achieve good aesthetic results [18]. When it comes to defining the color of denture base, we should take into consideration the size, shape and thickness of recoveries [19]. There are described different methods for specific coloring of complete dentures: insertion of various colors in the areas that need tinting, toning of the base in order to reflect features of the soft tissues and achievement of maximum conformity with them [20]. Unfortunately, color scales for soft tissues do not used routinely in dental practices [21].

Additionally, the characterization of denture base depends on the decisions made during its technological processing [22]. The authors have described numerous methods for modification of base's surface for creating maximally aesthetic appearance [23]. The implementation of similar approach is essential in the case of patients whereas denture base is exposed to greater degree while smiling and speaking. There are a lot of techniques for the reproduction of specific gingival texture and contours in order to achieve uneven light reflection that is typical to the smooth polished surfaces [24].

Despite the opportunities provided by the modern dental technologies and materials, the significance of type and volume of denture base in order to satisfy patients' aesthetic requirements is frequently neglected.

The aim of this research is to analyze the patient's satisfaction with aesthetic characteristics of complete denture base and to find out whether the design of the complete denture has been created with participation of

the patients.

MATERIAL AND METHODS

Study population: The research was conducted among edentulous patient who use upper complete denture. We inquired 105 (59 women and 46 men) patients, aged 58 to 76, who show up to be treated by the students - IV and V course in the Faculty of Dental Medicine, Medical University-Sofia, during the period 2017 – 2019.

Including criteria: patients with available upper complete denture made of PolyMethyl MethAcrylate (PMMA), prepared in various dental practices. All the participants had been using upper complete denture for more than one year, before showing up for the present treatment.

Excluding criteria: patients with partial removable dentures, patients with complete dentures made of materials different from PMMA; patients who had been using upper complete denture for less than one year.

Study instruments for research purposes, was created a questionnaire with close ended questions (Figure 1).

The included questions were structured after analysis of most frequently reported in dental literature patient's complaints about aesthetic appearance after complete denture placement.

Informed consent was obtained from all patients about voluntary participation in the investigation.

Data analysis

Only completely filled inquired card was included in the research. We performed statistical data processing with the assistance of Microsoft Office Excel 2016, including descriptive analysis; chi square analysis was used to determine the associations with age and gender. The selected level of significance was $p < 0.05$.

RESULTS AND DISCUSSION

Aesthetic appearance is a significant factor related to

Inquiry card for patients with complete dentures

Patient ID No. _____ /Name, Surname/ _____ /Age/ _____

Sex _____ Education _____

1. Jaw recovered via complete denture ☐ upper ☐ lower

2. How long have you been using your current dentures? _____

3. Do you believe the dentures' base characteristics matter when it comes to the aesthetic appearance of your dentures? ☐ Yes ☐ No

4. Did the doctor of dental medicine ask for your opinion on the color of denture base? ☐ Yes ☐ No

5. Was the color of denture base defined via special color scales? ☐ Yes ☐ No

6. Were you offered specific colouring of denture base, in order to achieve more aesthetic appearance of dentures? ☐ Yes ☐ No

7. Did the doctor of dental medicine comment with you the denture base thickness within the visible sections, in relation to correcting the soft tissue position? ☐ Yes ☐ No

8. Did the doctor of dental medicine comment with you the shaping of denture base within the visible sections – thickenings in the root area, imitation of the natural gingival texture etc.? ☐ Yes ☐ No

9. Were you offered characterization the dentures via specific changes of the denture base? ☐ Yes ☐ No

10. Are you satisfied with the appearance of the denture base? ☐ Yes ☐ No

11. If "No", why?: ☐ the colour is not suitable ☐ it is not well-shaped around the teeth ☐ it does not correct sufficiently the position of lips and cheeks ☐ it is too thick and creates discomfort ☐ too much of the denture base is exposed while smiling and speaking

Figure 1: Inquiry card for patients with complete dentures.

life quality and social relations of the patients being treated with complete dentures. Satisfaction with complete dentures is predefined by a set of objective and subjective factors. The clarification of the patient's preferences could contribute to the effective patient-centered practice to avoid patient dissatisfaction.

The data show dissatisfaction of patients related to various aspects of reproducing the soft tissues via the denture base. Most patients - 84.76% believe that denture base characteristics impact the aesthetics - 86.44% of the inquired women and 82.61% of the men, correspondingly. Hence design of denture base should be defined in detail, while taking into consideration the individual features of every patient.

Significant per cent of the inquired patients – 43.81% are not happy, in general with the appearance of the denture base (Figure 2).

Higher is the per cent of the women (52.54%) compared to the men (30.43%). The difference in answers provided by men and women is statistically significant – $p = 0.0004 < 0.05$.

According to the patients, the main reason behind the dissatisfaction with the denture base appearance is its color. It is defined as unsuitable by more than 1/3 (31.43%) of the inquired persons (Table 1). The per cent of women (40.68%) who do not like the denture base color is twice as higher than the one of the men (19.56%) who expressed similar opinion. of all women and of all men correspondingly. The difference in data

shows clearly outlined statistical significance – $p < 0.05 = 0.0008$.

To the question did the doctor of dental medicine asked for your opinion on the color of the denture base? "Positive answer was provided by 30.48% of the patients, by 35.59% of the women and 23.91% of the men, correspondingly. Color scale for determination of the base color was used with only 19.04% of the inquired persons whereas in the other 80.96% particular base color was not defined. Some patients - around 11% inform that the issue about color was commented but it was selected empirically with the description: "lighter" or "darker" resin is to be placed, without defining the color in particular. In most cases the choice of color was made without their participation, upon the discretion of the doctor of dental medicine or the dental technician. This confirms the opinions found in the dental literature that color scales for soft tissues are not used routinely in dental practices [21].

Secondly, as a reason behind the dissatisfaction with aesthetics 24.76% of all inquired persons report the unsuitable thickness of the denture base (Figure 3).

For about 15% of the inquired, major disadvantage is the insufficient correction of lip and cheek position after denture placement. More of the patients who underline this issue are women once again – 20.33%, whereas this is problem to only 3 (6.52%) of the men. These results confirm the data found in the literature stating that disapproval because of some aesthetic indicator is found



Figure 2. Column chart depicting the answers to the question: "Are you satisfied with the appearance of the denture base?" where x-axis denotes gender and numbers of patients in the researched group, while y-axis denotes per cent of patients, who provided answer "yes" or "no".

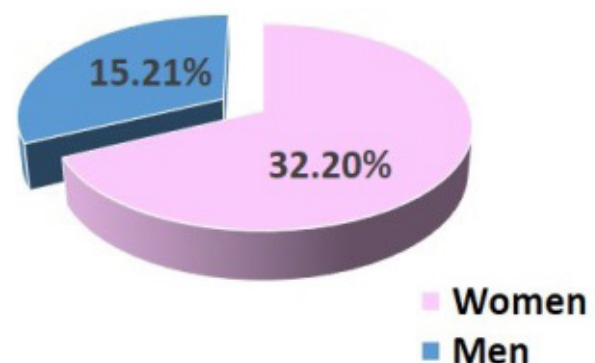


Figure 3: Pie chart depicting the per cent of the patients who do not approve the thickness of the denture base in the vestibular area. The per cent of the women who do not satisfy is twice as higher than the one of the men who expressed similar opinion.

Table 1. Reasons behind patients' dissatisfaction with the appearance of denture base.

Participants	Female		Male		P-value	Total	
	N* = 59		N= 46			N = 105	
Answers	n**	%	n	%		n	%
The color is not suitable	24	40.68	9	19.56	0.0008	33	31.43
It is not well-shaped around the teeth	11	18.64	4	8.69	0.0706	15	14.28
The thickness is not suitable	19	32.2	7	15.21	0.0878	26	24.76
It does not correct sufficiently the position of lips and cheeks	12	20.33	3	6.52	0.0434	15	14.28
It is too thick and creates discomfort while smiling and speaking	7	11.86	4	8.695	0.7023	11	10.48
Too much of the denture base is exposed while smiling and speaking	8	13.56	4	8.695	0.0436	12	11.43

N*-number of participants in the researched group, n*- number of participants that provide the concrete answer

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more often in women [9, 10]. These probably result from the fact that the type and volume of denture base impacts the general facial appearance and the ladies are significantly more concerned about this issue.

Discomfort while using the dentures because of abnormal base thickening in the vestibular areas is experienced by 10.48% of the inquired persons, 11.86% of the inquired women and 8.69% of the men, correspondingly. Some of the patients share the opinion that denture base changes their appearance in unsuitable manner, via too high protrusion of the upper lip. Three (women) of them report that the too thick denture base causes sensation of foreign body and discomfort while speaking and eating that has not been overcome even though these have been using the dentures for more than 1 year. When it comes to this indicator, there is no statistically significant difference between the replies provided by women and men.

The issues about denture base volume in the vestibular sections and the related opportunities for correction of soft tissues' position to certain degree in the lower one-third of face have not been discussed with most patients - 74.29%. This aspect of constructing the denture base has been discussed with around $\frac{1}{4}$ of the patients, whereas the women in this group are 2.5 times more than the men.

Thirdly, as reasons behind the non-aesthetic appearance of denture, the patients state the shaping of the denture base around the teeth and its high exposure when speaking and smiling.

The shaping of the denture base is not approved by 12.38% of the patients – by 16.95% of the women and 6.52% of the men, correspondingly. More often, the patients state as shortcoming the absence of clear borderline between the pink resin and dental neck and the absence of shaped up relief that imitates the natural gum appearance. This creates the sensation of gum edge absence and shows up the denture as artificial while speaking and smiling.

Around 11% of the researched persons complain from too high denture base exposure while speaking and smiling, which violates the aesthetics and embarrass them during social contacts. Most patients who state such disadvantage are women and the difference in data is statistically significant – $p = 0.0436 < 0.05$.

The appearance of vestibular surfaces of the denture base has been discussed with $\frac{1}{5}$ of the inquired persons. Some of them (5 women) inform that defining the denture base characterization happened after they raised the issue and stated their preferences and it was not initiated by the doctor of dental medicine.

In most of the cases issues about denture base shaping and its thickness have not been raised at all (Figure 4).

These data support the opinion according to which one of the reasons behind the dissatisfaction of patients with complete dentures is the inadequate communication

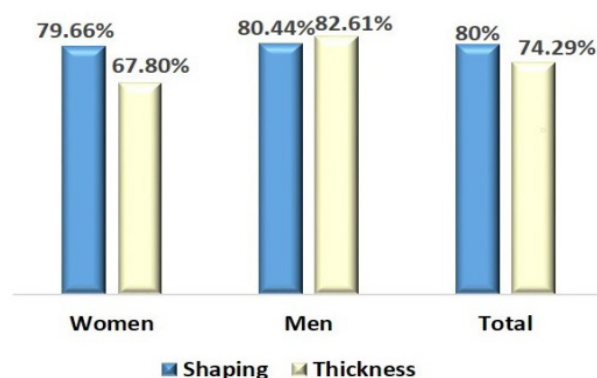


Figure 4: Bar chart depicting the percent of women and men, with who doctor of dental medicine didn't discuss the issue about thickness and shaping of the denture base in the vestibular area.

between doctor and patient. This confirms the opinion expressed by numerous authors that the doctors of dental medicine apply as pattern one and the same models about the denture base characteristics without the participation of patients and do not inform them sufficiently about the opportunities for denture characterization.

The data show dissatisfaction of patients related to various aspects of reproducing the soft tissues via the complete dentures. In view of some researched indicators in the women we register higher level of non-approval compared to the men, but in limitation of this study, we couldn't confirm any positive association between age and patient's satisfaction.

Optimal aesthetic result when recovering the masticatory system via dentures could be achieved only via the selection of suitable design of the denture base. At the trial stage, the patients have to be provided with the opportunity to get real idea of the appearance and arrangement of teeth, as well as of the soft tissues recovered via the denture base.

CONCLUSION

Considerable numbers of inquired patients (43.81%) do not approve the denture base appearance in the frontal area of their complete dentures and believe that this impacts negatively the aesthetic effect of denture treatment. The main reasons behind patients' dissatisfaction are unsuitable denture base color, insufficient correction of soft tissues' position after the placement of complete dentures and shaping up of denture base in the visible area. This confirms the necessity of precise clarification of patient's requirements, concerning the reproduction of lost tissues via the denture base. Unfortunately, the opportunity for determination in detail of the denture base characteristics is frequently omitted. In order to overcome the effect of mismatch between the expected and the actual aesthetic results we need to create the design of the complete denture with patient's informed participation.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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