

Oral Tissue Differences Among Conventional And Immediate Dentures

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Abstract:

Background: During the lifetime, each person experiences loss of one or more teeth, which is followed by a series of problems, such as difficulty in chewing, speaking and perhaps the biggest problem is disturbed aesthetics and altered appearance.

Conventional and immediate complete dentures including implant-supported total dentures, implant-supported fixed prostheses are used to rehabilitate completely toothless patients who are often burdened with feelings of disability, early aging, limited chewing function and reduced mouth space.

The main factors for the acceptance of any mobile prosthetic device are the provision of aesthetic, phonetic, psycho-social and functional requirements, followed by the fact that patient's lost aesthetics, instability and discomfort when wearing dentures are the main factors for dissatisfaction with mobile prosthetic accessories.

Materials and Methods: For realization of the set goals for the research in the Clinic for Removable Prosthodontics at the Faculty of Dentistry in Skopje, Republic of North Macedonia, during a period of 3 years 60 patients, aged 54 to 70 years, were examined and selected, divided into two groups. In 30 of them, we made immediate complete dentures, and in the other 30 conventional complete dentures(made over a period of time from two to six months after tooth extraction).

Results: In our study, we fabricated immediate dentures in patients with an average age of 59 years and 46.7% of them were with secondary school and 46,7 had higher education, 50% of them had healthy teeth or fixed prosthetic appliances as antagonists, and conventional dentures were made in patients with an average age of 63.5 years, of which 53.3% had secondary and 23.3% with higher education, and with antagonists predominantly partial (50%) and complete (36.7%) dentures. In 66.7% of the patients in whom we made immediate dentures, we did not find disturbed intermaxillary relations, they the height of the lower third of the face were preserved with the remaining teeth, 73.3% of the subjects in this group had no temporomandibular joint pain. Unlike this, all patients in the group to whom we made conventional complete dentures had disturbed intermaxillary relations and 53.3% had temporomandibular joint pain

Conclusion: Patients with immediate dentures have significantly less changes on the orofacial musculature, fewer have intermaxillary disturbances and extraoral appearance changes, and a smaller number of patients have temporomandibular joint pain as well as less speech problems, but in these patients the remaining teeth are usually in very poor periodontal condition. Patients treated with conventional dentures, before the treatment had disturbed extraoral appearance, impaired intermaxillary relations and orofacial musculature with decreased tone, temporomandibular joint pain, and speech difficulties.

Key Words: complete dentures, immediate dentures, oral tissues changes

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I. Introduction

Oral health should be understood as a continuing process of adaptation of all tissues of the orofacial system to the specific conditions in which the organism finds itself. According to a 2002 WHO definition, oral health is a state of complete normality and functional capacity of the teeth and their supporting tissues. It is a state of health of the oral cavity and of all parts of the masticatory system that should give optimal performance in physiological functions, especially in chewing, speech and aesthetics (WHO, 2002)⁽¹⁾.

Toothlessness is a widespread oral health problem worldwide. The extension of human life expectancy, carbohydrate-rich diets, poor socioeconomic conditions in many countries of the world as well as in our country are the reasons why many people cannot access adequate dental care, so partial and complete dentures remain as treatment options. More recent researches suggest that oral disorders and dysfunctions have serious emotional and psychosocial consequences. The reintegration into normal life of people after a disability (which may include tooth loss) is of utmost importance, especially the speed of fabricating and quality of removable dentures, which can be seen as an instrument for restoring patient's oral-health depending quality of life.

During the lifetime, each person experiences loss of one or more teeth, which is followed by a series of problems, such as difficulty in chewing, difficulty in speaking and perhaps the biggest problem is disturbed aesthetics and altered appearance due to collapsed lips, flushed cheeks, approaching nose and chin to give an aging facial appearance.

Conventional and immediate complete dentures including implant-supported complete dentures, implant-supported fixed prostheses are used to rehabilitate completely toothless patients who are often burdened with feelings of disability, early aging, limited chewing function, and reduced mouth space ^(2,3,4).

The main factors for the acceptance of any mobile prosthetic device are the provision of aesthetic, phonetic, psycho-social and functional requirements, because the patients note the aesthetics, instability and discomfort while wearing dentures as the main factors for dissatisfaction with mobile dentures ⁽⁵⁾.

Correctly fabricated mobile dentures can result with excellent aesthetic effects, similar to natural ones, while at the same time they are providing excellent hygiene.

It has been proven that anomalies of this region lead to disturbances of functions: speech, breathing, swallowing and chewing, which makes invisible anomalies (which are in the oral cavity) visible. Thus, everyone will notice a speech defect of the individual, which is caused by certain morphological anomalies of the tongue or palate, or bad alignment of the teeth. Muscle damage leads to manifest outbursts in the appearance of the face or its facial expressions. The teeth, jaws, chin, lips and cheeks affect the overall aesthetic impression of the individual's face with their appearance. If any of those components deviates from the normal development and shape, the aesthetic appearance changes, and this has a direct impact on the mental health and the fit of the individual in the environment. Therefore, each patient should be approached by special attention as a unique and a separate individual, and not to solve dental issues as an isolated problem, which could disturb the aesthetic appearance of the patient ⁽⁶⁾.

On time production of prosthetic appliances and a natural appearance is one of the basic prerequisites for success and mutual satisfaction of the patient and therapist. This naturalness is expressed by the shape, size, position and number of teeth. Patients want artificial teeth to be like theirs, not only to be noticed by anyone, but also to look significantly younger, without changing their physiognomy significantly. Due to different anatomical, physiological, financial, and other constraints, mobile complete dentures remain the first therapeutic choice for most patients. Mobile complete dentures can be constructed in a conventional manner or can be made as immediate dentures, whose fabrication is challenging for the prosthodontists. Classical (conventional) complete dentures are performed after the period of physiological resorption of the alveolar bone has ended, while an immediate prosthesis is defined as any prosthetic appliance that is made to replace the lost dentition and all structures of the maxilla and mandible and is applied immediately after the extraction of the natural teeth (Caputi *et al.*, 2014)⁽⁷⁾.

Immediate dentures act as a bandage to control bleeding and to heal the extraction wounds more quickly. This way patients achieve adequate speech, aesthetics and mastication much earlier than with conventional ones, when the patient must wait for the extraction wounds to fully heal ⁽⁸⁾.

Immediate dentures can later be modified and after the healing period of extraction wounds to serve as definitive dentures (Zarb *et al.*, 2004) ^(9,10).

The advantage of immediate dentures is the presence of natural teeth in the patient's mouth during the production of dentures, which makes it possible to choose artificial teeth that correspond to the size, shape, color of the natural teeth and at the same time can be placed in the place where the natural teeth were, it is possible to achieve continuous and proper habitual function and facilitate chewing, swallowing, and speech ⁽¹¹⁾.

Because any prosthetic replacement should have a therapeutic as well as a preventive role in further tissue changes, it is imperative that they be made as soon as possible after tooth loss.

Based on the above explanations and definitions of the problem, the main goal of our research was to determine the advantages and disadvantages of immediate compared to conventional timely made removable dentures (from two to six months after tooth extraction).

II. Material And Methods

For the realization of the set goals of the research, in the Clinic for Removable Prosthodontics, at the Faculty of Dentistry in Skopje, Republic of North Macedonia, during a period of 3 years 60 patients, aged 54 to 70 years, were examined and selected, divided into two groups. In 30 of them, we made immediate complete dentures, and in the other 30 conventional complete dentures (made over a period of time from two to six months after tooth extraction).

To achieve the goals of the study, before starting therapy, after a period of 4-6 weeks and after six months of wearing the dentures, we conducted a survey of patients in special questionnaires. From each patient a detailed personal and family history was taken, and the relevant medical history was evaluated. Each patient underwent a complete clinical evaluation to evaluate the condition of the remaining teeth, muscle changes, the condition of the oral mucosa, and asked if they had pain in their temporomandibular joint, as well as extraoral observation of

the patient's face and correlation with the vertical dimension were noted. All patient's answers and measurements were noted and statistical evaluated.

The degree of myofacial pain was scored according to the criteria established in the Pressure Pain Threshold Scale (PPTS). The degree of pain was determined by palpation of m. masseter and m. temporalis and patient's response to it.

Changes in the temporomandibular joint (pain, wheezing, crepitus) were clinically investigated.

Study groups:

1. Group one consisted of 30 patients to whom we made immediate dentures on a working model from a sample taken before tooth extraction and placed in the oral cavity immediately after tooth extraction (figure 1).



Figure 1. Immediate denture fabrication

2. Second group also consisted of 30 patients to whom we made conventional dentures with a traditional way of fabricating (figure 2).



Figure 2. Conventional denture fabrication

III. Results

After completing of our examination we got the following results:

The first group consisted of 30 patients who had immediate dentures. Of the total 30 patients, 15 (50.00%) were men and 15 (50.00%) were women.

The age of the patients in whom the immediate dentures have been made is shown in table 1.

The age of the patients ranged from 58.83 to ± 2.74 years, $\pm 95.00\%$ CI: 57.81-59.86; the median was 59 years, the minimum age was 54 years, and the maximum age was 64 years.

Table 1. Age of patients

Variable	Valid N	Mean	Confidence -95,00%	Confidence +95,00%	Median	Minimum	Maximum	Std.Dev.
Age	30	58,83	57,81	59,86	59	54	64	2,74

The second group consisted of 30 patients who got conventional dentures. Of the total 30 patients, 15 (50.00%) were men and 15 (50.00%) were women.

The age of the patients who received conventional prostheses is shown in table 2.

Patient age ranged from 62.80 to ± 3.61 years, $\pm 95.00\%$ CI: 61.45-64.15; median 63.50 years, minimum age 56 years, and maximum age 70 years.

Table 2. Age of patients

Variable	Valid N	Mean	Confidence -95,00%	Confidence +95,00%	Median	Minimum	Maximum	Std.Dev.
Age	30	62,80	61,45	64,15	63,50	56	70	3,61

The results shown in table 3 are related to disturbed intermaxillary relationships in patients with immediate and conventional dentures.

Of the 30 patients with immediate dentures, 20 (66.7%) had no disturbed intermaxillary relationships and 10 (33.3%) had intermaxillary relationships disturbed.

Of the 30 patients with classical dentures, all 30 (100.0%) had disturbed intermaxillary relationships.

For Pearson Chi-square = 30.0 and $p < 0.001$ ($p = 0.000$), impaired intermaxillary relations are significantly prevalent in patients with classical dentures compared to patients with immediate dentures.

Table 3. Inter-maxillar relations

			Inter-maxillar relations		Total
			Not disturbed	Disturbed	
Type of denture	Immediate Denture	Count	20	10	30
		%	66,7%	33,3%	100,0%
	Conventional Denture	Count	0	30	30
		%	0,0%	100,0%	100,0%
Total		Count	20	40	60
		%	33,3%	66,7%	100,0%

The results shown in table 4 refer to temporomandibular joint pain in patients with immediate and conventional dentures.

Of the 30 patients with immediate dentures, 8 (26.7%) had temporomandibular joint pain and 22 (73.3%) had no temporomandibular joint pain.

Of the 30 patients with conventional dentures, 16 (53.3%) had temporomandibular joint pain and 14 (46.7%) had no temporomandibular joint pain.

For Pearson Chi-square = 4.44 and $p < 0.05$ ($p = 0.035$), temporomandibular joint pain is significantly prevalent in patients with conventional dentures compared to patients with immediate dentures.

Table 4. Pain in temporomandibular joint

			Pain in TMJ		Total
			No pain	With pain	
Type of denture	Immediate Denture	Count	22	8	30
		%	73,3%	26,7%	100,0%
	Conventional Denture	Count	14	16	30
		%	46,7%	53,3%	100,0%
Total		Count	36	24	60
		%	60,0%	40,0%	100,0%

The results which are shown in table 5, are about speech difficulties in patients with immediate and conventional dentures.

Of the 30 patients with immediate dentures, 13 (43.3%) had speech difficulties and 17 (56.7%) did not have speech difficulties.

Of the 30 patients with conventional dentures, 30 (100.0%) had speech difficulties.

For Pearson Chi-square = 23.72 and $p < 0.001$ ($p = 0.000$), speech difficulties are significantly prevalent in patients with conventional dentures compared to patients with immediate dentures.

Table 5. Speech difficulties

			Speech difficulties		Total
			No	Yes	
Type of denture	Immediate Denture	Count	17	13	30
		%	56,7%	43,3%	100,0%
	Conventional Denture	Count	0	30	30
		%	0,0%	100,0%	100,0%
Total		Count	17	43	60
		%	28,3%	71,7%	100,0%

IV. Discussion

Total toothlessness is a specific condition that affects the functions of chewing, speech, and appearance, and wearing total dentures has been associated with feelings of shame, pain, premature aging, decreased self-esteem, discomfort, and thus an impact on quality of life that depends on oral health^(12,13,14).

In our study, we fabricated immediate dentures in patients with an average age of 59 years and 46.7% of them were with secondary school and 46.7 had higher education, 50% of them had healthy teeth or fixed prosthetic appliances as antagonists, and conventional dentures were made in patients with an average age of 63.5 years, of which 53.3% had secondary and 23.3% with higher education, and with antagonists predominantly partial (50%) and complete (36.7%) dentures. Our results showed that the most common reason for tooth extraction was periodontal disease, followed by caries and trauma.

Changes in the appearance of the patients are accelerated by tooth loss and the resorption of the alveolar ridges, resulting in disturbed vertical dimension, and decreased lower third of the face and these changes lead to changes in the facial muscles.

According to these results of ours are the results of Raustia AM et al. who, by computed tomography scans and electromyographic imaging of the m.masseter and the temporal muscles before prosthetic treatment as well as at 4 weeks and 6 months after prosthetic treatment, determined that a long toothless period is noticeable not only in masticatory muscle function with reduced electromyographic activity, but also by a decrease in muscle density, which implies that there is muscle atrophy, which is detected on computed tomography of the muscles⁽¹⁵⁾. In 66.7% of the patients in whom we made immediate dentures, we did not find disturbed intermaxillary relations, they the height of the lower third of the face were preserved with the remaining teeth, 73.3% of the subjects in this group had no temporomandibular joint pain. Unlike this, all patients in the group to whom we made conventional complete dentures had disturbed intermaxillary relations and 53.3% had temporomandibular joint pain (Tabs. 3 and 4).

These observations are in agreement with other authors, who point out that the loss of all teeth leads to a decrease in chewing forces, to a decrease in muscle tone, and bone loss also affects muscle attachments, leading to the formation of folds on the face and to the approach of the nose and chin, i.e. the appearance of pseudoprogeny^(16,17,18). All of these changes distort the patient's facial appearance and make them look older than they actually are. This also leads to temporomandibular joint trauma, followed by pain, discomfort, joint creaking, and headaches^(19,20). Every change in facial height or jaw height due to tooth loss manifests itself on the temporomandibular joint well, so it is not surprising that joint surfaces undergo slow but continuous remodeling throughout life, and that remodeling is likely the way opposite surfaces of temporomandibular joint maintain their alignment^(21,22).

Clinical examinations in patients in whom we have made conventional dentures have shown changes in the tongue in way of its enlargement. This is also noted by Chen et al. who say that with the loss of teeth, especially the lateral ones, the tongue also changes, it enlarges and tends to come into contact with the cheek mucosa, and this enlargement of the tongue is a problem when the patient begins to wear complete dentures, because the mouth space is limited and it takes time to adapt to the new conditions. This conclusion is also reached by Anne et al., who points out that an important factor is the position and elevation of the tongue, which is involved in the functions of speech, mastication, and swallowing^(23,24).

Results concerning speech difficulties in patients with immediate and conventional prostheses (Table 5) showed that out of 30 patients with immediate prostheses, 17 (56.7%) had no speech problems, while 13 (43.3%) had speech difficulties, but from the 30 patients with conventional dentures, 30 (100.0%) had speech difficulties and problems with speech and pronunciation of certain letters and sounds. For $p < 0.001$ ($p = 0.000$), speech difficulties are significantly prevalent in patients with conventional dentures compared to patients with immediate dentures.

According with our observations on patient speech, is the Palmer's study, which points that speech distortions are present in the evaluation of speech prior to prosthetic treatment, especially in patients who have been toothless for extended periods of time⁽²⁵⁾, while Rosa and R. R. Berretini believe that some patients may require treatment by a speech therapist for speech corrections after prosthetic treatment⁽²⁶⁾.

Keyvan points the periodontal status of the remaining teeth to be extracted, the location of these teeth, changes in soft dental tissues and the existence of exostosis as some of the important local factors important for deciding which type of dentures to be made conventional or immediate⁽²⁷⁾.

It is known that the most difficult challenge for the dentist and the patient is the transition from a condition with present teeth to a toothless state. The loss of the last teeth is a stressful experience and means changes in facial appearance, mastication problems, speech loss, and a decline in quality of life, especially when it takes a long healing period before dentures are placed^(28,29).

The ultimate goal of the dentures is to offer comfort to the patients, allowing them to speak smoothly, chew efficiently, and be responsive to aesthetic factors and requirements⁽³⁰⁾.

Although the difference may not be great, we can say that relatively younger patients and those with higher education, patients who are still working or engaged in other activities and are in constant social contacts were more interested in making immediate dentures.

An appropriate therapeutic solution should be approached for each patient, appropriate both to the dental as well as the general medical condition, ensuring the easiest possible transition to a completely toothless condition and use of mobile complete dentures. Even when further therapy with implant-supported prostheses is planned, a certain transition period is still unavoidable. Clinical treatment decision is crucial to avoid stress in these patients. The significance of this research refers to point the important issues for the health and quality of life in patients treated with different types of prosthetic treatments, specially, it is about identifying, analyzing, and evaluating the quality of life in patients treated with different types of mobile prosthetic dentures.

V. Conclusion

As conclusion we can say that patients with immediate dentures have significantly less orofacial muscles` changes, they rarely have intermaxillary disturbances and extraoral appearance changes, fewer number of patients have temporomandibular pain so as speech problems, but in these patients the remaining teeth are usually in very poor periodontal condition. Patients treated with conventional prostheses, before the treatment had disturbed extraoral appearance, intermaxillary relations and speech and changed orofacial muscles with decreased tone, and more frequent temporomandibular pain.

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