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Effectiveness of Complete Removable Plate Prosthesis Preparation Methods in the Orthopaedic Treatment of Secondary Complete Adentia.

[1]Bayramov Yuris Idris

(Doctor of Philosophy in Medicine)
Orthopedic stomatology department of the Azerbaijan Medical University, Baku, Azerbaijan

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KEYWORDS
Secondary complete adentia (SCA), complete removable plate prosthesis (CRPP), orthopedic treatment

ABSTRACT:
Objectives: Comparative evaluation of the results of orthopaedic treatment of secondary complete adentia with complete removable plate prosthesis with conventional and improved methods.
Subjects and methods In the study, a total of 211 patients, 106 (50.2%) men and 105 (49.8%) women, aged 45 to 59 years, were examined in the adaptation period after orthopaedic treatment of secondary complete adentia with complete removable plate prosthesis.
With the object of the study, the functionality of prosthesis was studied in two groups depending on the dental status. A control group applied a well-known conventional method to prepare a complete removable plate prosthesis, while the main group applied our improved method. The M.D. Korol classification was used as a clinical criterion in evaluating the functionality of complete removable plate prosthesis made by our conventional and improved methods.
Results
In the subgroups of the control group, where a complete removable plate prosthesis was prepared, clinical cases showed that no correction was performed in the upper and lower jaw prosthesis from the 7th to 33rd day of adaptation, while in the subgroups of the main group, upper and lower jaw prosthesis were corrected.
Conclusions.
Unlike the conventional method, the improved method involves instead of the physician, the patient performing pressure on the functional measurement taken at the third clinical stage. This pressure corresponds to the pressure exerted by the patient on the prosthesis when using the prepared prosthesis.

Clinical Significance.
The conventional method consists of 5 clinical and 4 technical stages. The improvement of the conventional method consists of 4 clinical and 3 technical stages. There is no additional time loss for the physician and the patient and the prepared prosthesis is more functional.

I. INTRODUCTION

Secondary complete adentia (SCA) continuously hampers the patient's quality of life. SCA impairs important vital functions such as chewing and nutrition for the rest of a person's life. In addition, SCA causes a change in the social status of the patient, the communication characteristics are compromised by articulation and speech disorders, as well as results in atrophy of the chewing muscles and psychoemotional changes [1-2].

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During SCA, patients are less able to adapt to orthopaedic treatment, have weaker muscle control mechanisms, and, as a result, experience less satisfaction [3].

The main orthopaedic treatment method of SCA is considered to be the preparation of complete removable plate prosthesis (CRPP), which presents many complex and intractable problems for physicians, dentists and orthopaedic surgeons. Dental care is becoming increasingly complex and difficult, the main reason for which is the lack of remaining teeth in the oral cavity, the severity of the pathological changes that have occurred and the problem of age-dependent orthopaedic dental care. The function performed by CRPP in the oral cavity declines with age, however the patient`s needs remain same [4].

No discomfort after using CRPP means that the orthopaedic treatment is satisfactory. Within the scope of standard physiological rules, CRPPs require special skills of the physician as devices that must replace not only missing teeth, but also atrophied tissues in the prosthetic area [5].

All physicians, dentists and orthopaedic surgeons should take the time to respond to prosthesis-related complaints after providing CRPP to their patient. The most common complaints include difficulty in chewing, traumatic injuries of the mucous membrane, impaired speech, aesthetic complaints about the prosthesis, whistling when speaking, ear pain, ingress of saliva from the edges of the prosthesis, loss of sense of taste, food filling under the prosthesis, movement of the prosthesis during solid food intake, nausea and vomiting [6].

Despite the high demand for CRPP among the population, statistical data over the past few years indicate that 25% of patients with SCA were unprepared for CRPP. According to WHO, 20-26% of patients do not use their CRPPs at all, 37% of patients had to get used to their low-quality prosthesis, which adversely affects on the maxillofacial system. During chewing, CRPPs are not fixed in 52% of cases, in 65% of patients who use dentures, various diseases develop in the mucous membrane of the prosthesis palate with pathological changes especially in the tissues of the retention area [7].

The problem of prosthesis fixation in edentulous jaws has a long history, but even now, the issue has not been completely resolved, and study in this field is still ongoing. Although science and technology have advanced to modern levels, the use of CRPP is still inevitable, especially after complete tooth loss. Protecting the patient's ability to eat, chew (functional purpose), aesthetic appearance (cosmetic purpose), clear and intelligible speech (phonetic purpose), continuity and integrity of tissues (biological purpose) within the physiological limits with the used CRPP, eliminating psychological problems (psychological purpose) caused by lack of teeth is the biggest study object of modern dentistry [8].

The efforts of researchers to overcome this problem have resulted in the development of very advanced dental materials science. Even if all kinds of measuring materials are produced for the preparation of CRPP, elastic (alginate-based), silicone (duplex), crystallizing (ZnO-eugenol-based-repin), the problem is still relevant [9-10]. However, the root cause of the problem is well-known shortcomings of the conventional method used in the preparation of CRPP.

The conducted study ***aims*** to compare the results of orthopaedic treatment of secondary complete adentia with complete removable plate prosthesis by conventional and improved methods.

II. SUBJECTS AND METHODS

In the study, a total of 211 patients, 106 (50.2%) men and 105 (49.8%) women, aged 45-59 years, were examined in the adaptation period after orthopaedic treatment of secondary complete adentia with complete removable plate prosthesis.

The functionality of the prepared prosthesis during the adaptation period was studied in two groups, control and main groups. In the control group, a complete removable plate prosthesis was made by the conventional method (*Figure* 1), and in the main group by our improved method (*Figure* 2) [9]. The results obtained in line with the purpose of the study were studied in three subgroups depending on the dental status in both groups. Thus, 49 patients, including 27 (55.1%) men and 22 (44.9%) women, aged between 45-59 years, in the *first subgroup* of the control group and 32 patients, including 16

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(50,0%) men and 16 (50,0%) women in the *first subgroup* of the main group, were not treated orthopedically with CRPP after tooth loss.

In the *second subgroup* of the control group, 47 patients, including 22 (46,8%) men and 25 (53,2%) women, in the *second subgroup* of the main group, 20 patients, including 10 (50,0%) men and 10 (50,0%) women, had CRPP prepared by the "conventional method" for both jaws. During orthopaedic treatment, CRPPs were prepared in a conventional way, however were not used even for one day due to reasons such as pain, poor fixation, inability to chew food, and speech impairment.

In the *third subgroup* of the control group, 43 patients, including 21 (48,8%) men and 22 (51,2%) women, in the *third subgroup* of the main group, 20 patients, including 10 (50,0%) men and 10 (50,0%) women, had CRPP due to SCA, in orthopaedic treatment, the CRPP was prepared using a conventional method, it is not considered satisfactory as it has been used for more than three years, its use brings about difficulties and it needs to be renewed.

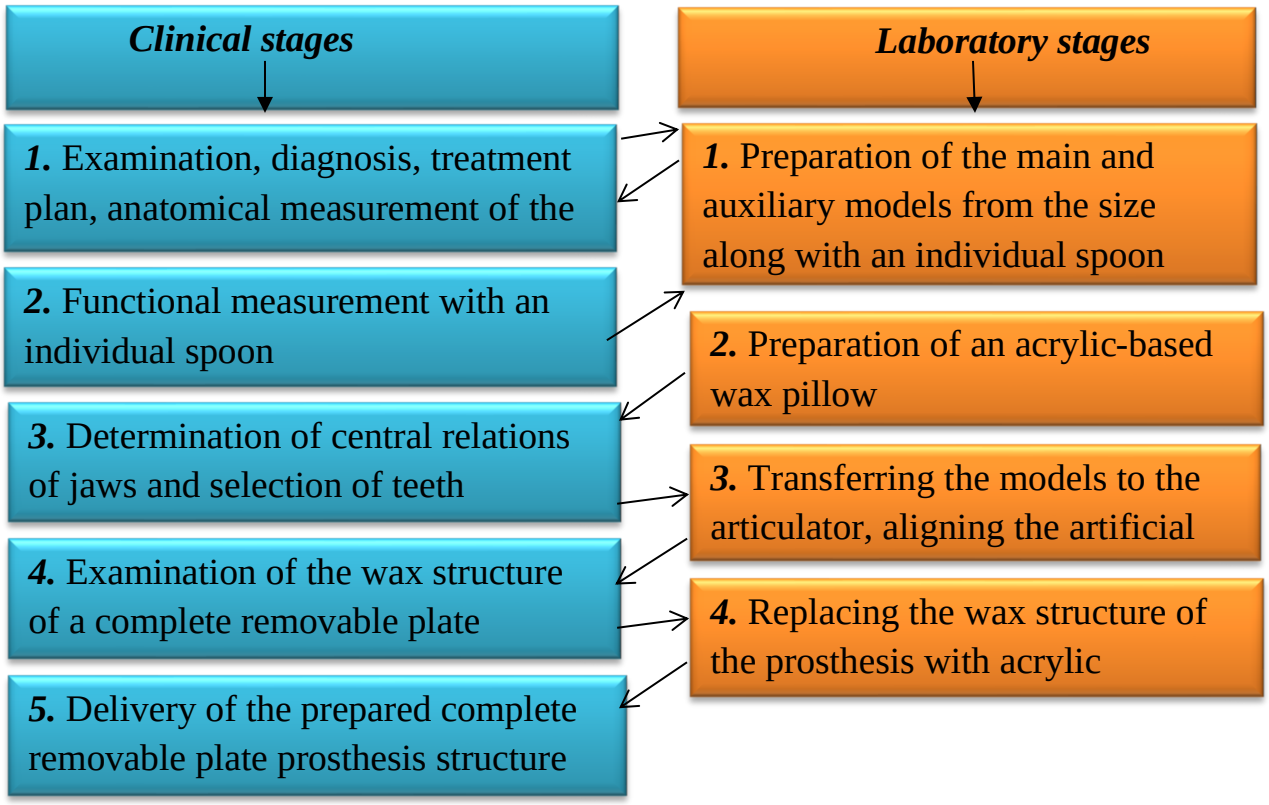

Figure 1: Clinical and laboratory stages of CRPP preparation applying the traditional method.

Clinical stage 1: Oral examination. Examination of the oral cavity. Examination of the extent of atrophy and resorption of the soft and hard tissues of the prosthesis area according to the Supple and I.M.Oxman classifications, treatment plan, anatomical measurements. Sending the received measurement to the laboratory.

Laboratory stage 1: Casting the resulting anatomical size gypsum model and preparing an individual spoon

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according to the borders of the prosthesis to be formed on the model.

Clinical stage 2: Fitting the individual spoon to the prosthetic bed, performing Herbs tests (5:7), rimming the edges of the spoon with thermoplastic compound, softening the compound in hot water and placing it the oral cavity to create a circular valve area. It is then prepared by silicone-based (A-Silicone) crystallization (repin). Apply a thin layer of measuring compound to a spoon and insert it into the oral cavity to perform Herbst tests (5:7) to form a transitional fold. After that, the measuring spoon is sent to the laboratory.

Laboratory stage 2:

1. Preparation of gypsum base model and control gypsum model from the functional absorption dimension

2. Preparation of an acrylic-based wax pillow for determining central occlusion.

Clinical stage 3: Determination of central occlusion:

1. Inserting dental wax pillows into the oral cavity

2. Determination of tooth height by anatomical and physiological methods, smile line, central line, canine line, final determination of the jaw central relations by simultaneous fixation of the central relations, determination of the colour, shape and volume of artificial teeth.

Laboratory stage 3: Mounting the model to the articulator, aligning the artificial teeth and preparing the acrylic-based temporary prosthesis.

Clinical stage 4: Confirming the wax structure of the CRPP in the model and in the oral cavity.

Laboratory stage 4: Replacing the wax structure of the CRPP with plastic.

Clinical stage 5: Delivery of the prepared CRPP structure

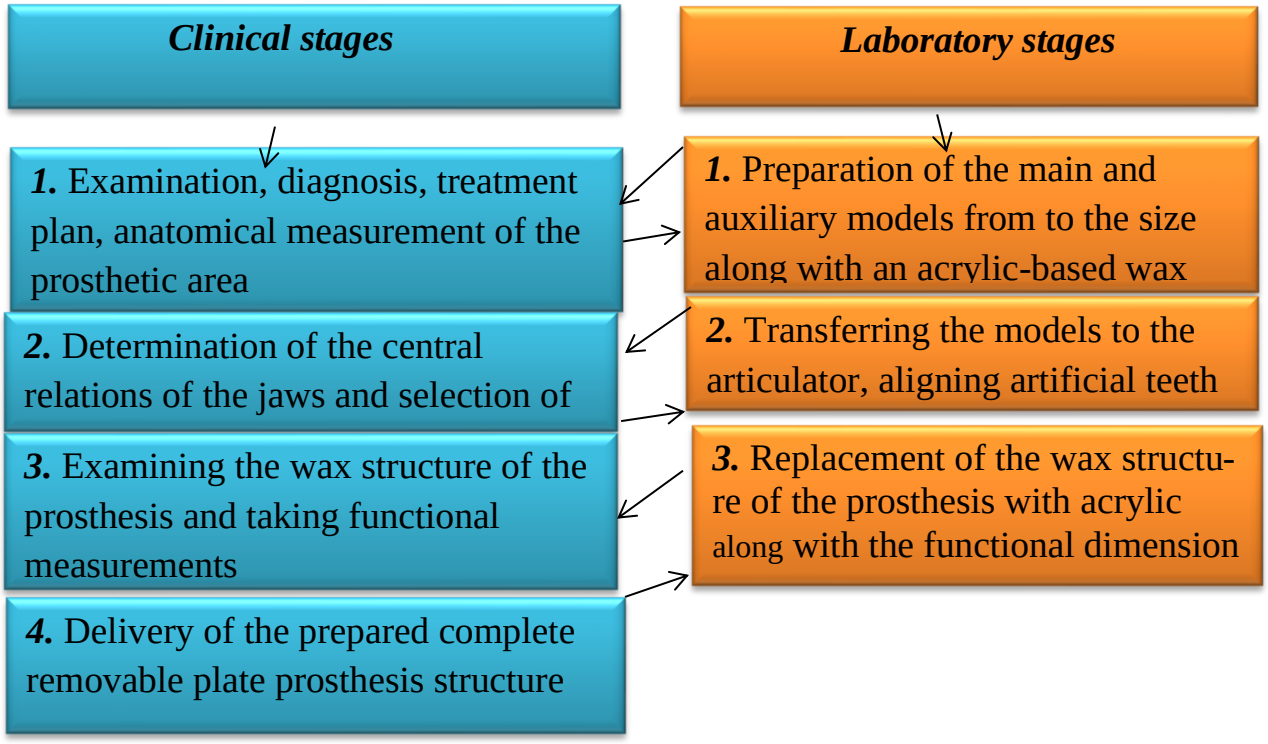

Figure 2: Clinical and laboratory stages of preparation of CRPP by applying our improved method.

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Clinical stage 1: Oral examination. Examination of the oral cavity. Examination of the extent of soft and hard tissue atrophy and resorption in the prosthesis area according to the Supple and I.M.Oxman classifications, treatment plan, anatomical measurements. The received measurement is sent to the laboratory.

Laboratory stage 1:

1. Preparation of the main and control plaster models from the received anatomical measurements

2. Preparation of an acrylic-based wax pillow for determining central occlusion.

Clinical stage 2: Determination of central occlusion:

1. Examining the dental wax pillows on the model and in the oral cavity

2. Determination of tooth height by anatomical and physiological methods, smile line, central line, canine line, final determination of the jaw central relations by simultaneous fixation of the central relations, determination of the colour, shape and volume of artificial teeth.

Laboratory stage 2: Attaching the models to the articulator, aligning artificial teeth and preparing an acrylic-based temporary prosthesis.

Clinical stage 3:

1. Examining the wax structure of the CRPP on the model and in the oral cavity:

2. Conducting Herbs tests (5:7), surrounding the edge of the acrylic base with a thermoplastic compound, softening the compound in hot water and inserting it into the oral cavity to form a circular valve area, preparing one of the silicone-based (A silicone), crystallizing (repin) measurement materials, a thin layer is applied to the acrylic base and inserted it into the oral cavity and subjected to the Herbs tests (5:7) again, forming a transitional fold. After that, the measured wax structure of the complete removable plate prothesis is sent to the laboratory.

Laboratory stage 3: Casting a model from the size taken with the wax structure of the CRPP and replacing the wax structure of the prosthesis with plastic on top.

Clinical stage 4: Delivery of the prepared CRPP structure.

According to the M.D.Korol (1990) classification, the clinical criteria for evaluating the function of the CRPP made by conventional and our improved methods were based on number of corrections (tooth chippings) due to traumatic injury (after 7 days, 33 days, 6 months, 12 months, 24 months, 36 months) to the prosthesis bed mucosa. Therefore, ***excellent*** – if no corrections are performed at all, ***good***- if only one correction was performed, ***satisfactory*** - if correction is performed 2-3 times, ***bad*** - if correction is performed more than 3 times.

III. RESULTS

As shown in the table for ***the first subgroup*** (patients who did not receive orthopaedic treatment with CRPP due to SCA), upper jaw prosthesis in the control group were considered good up to the 7th day after treatment, as they were corrected once in 18 patients, and considered satisfactory as correction was performed on them 2-3 times in 31 patients. Lower jaw prosthesis were deemed satisfactory in 41 patients due to 2-3 corrections, and poor in 8 patients due to more than 3 corrections. In the main group, upper jaw prosthesis were assessed as excellent as they were not corrected in 23 patients and satisfactory as they were corrected 2-3 times in 9 patients. Lower jaw prosthesis were considered excellent as no correction was performed in 6 patients, considered good as they were corrected only once in 12 patients, and considered satisfactory as they were corrected 2-3 times in 14 patients.

By day 33, upper jaw prosthesis in the control group were good as prosthesis in 19 patients were corrected once and satisfactory because corrections were performed in 30 patients for 2-3 times. Lower jaw prosthesis were considered excellent as no correction was done in 2 patients, considered good as correction in 1 patient was made once, and satisfactory because of 2-3 corrections in 46 patients. In the main group, upper and lower jaw prosthesis were evaluated as excellent, as none of the 32 patients underwent any correction.

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Table 3. The number of corrections during the period of prosthesis adaptation (7 days, 33 days) in the first subgroups of the control and main groups

		Subgroup 1			
		Control		Base	
		Count	Column N %	Count	Column N %
Korol-upper prothesis 7 days	Excellent	0	0,0%	23	71,9%
	Good	18	36,7%	0	0,0%
	Satisfactory	31	63,3%	9	28,1%
	Bad	0	0,0%	0	0,0%
Korol-upper prothesis 33 days	Excellent	0	0,0%	32	100,0%
	Good	19	38,8%	0	0,0%
	Satisfactory	30	61,2%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol-lower prothesis 7 days	Excellent	0	0,0%	6	18,8%
	Good	0	0,0%	12	37,5%
	Satisfactory	41	83,7%	14	43,8%
	Bad	8	16,3%	0	0,0%
Korol-lower prothesis 33 days	Excellent	2	4,1%	32	100,0%
	Good	1	2,0%	0	0,0%
	Satisfactory	46	93,9%	0	0,0%
	Bad	0	0,0%	0	0,0%

As shown in the table of the ***second subgroup*** (those who don't apply prosthesis even though they have a CRPP made by "conventional method" for both jaws), the upper jaw prosthesis in the control group were rated good as correction was performed on them once in 14 patients, satisfactory as they were corrected 2-3 times in 16 patients, and poor because they were corrected more than 3 times in 17 patients. Lower jaw prosthesis were considered good as correction was made once in 16 patients, satisfactory as correction was performed for 2-3 times in 26 patients, and bad because correction was performed for more than 3 times in 5 patients. In the main group, upper jaw prosthesis were evaluated as excellent as no correction was made in 14 patients and satisfactory because they were corrected 2-3 times in 6 patients. Lower jaw prosthesis were evaluated as excellent since no correction was conducted in 7 patients, good as they were corrected once in 3 patients, and satisfactory since correction was performed for 2-3 times in 10 patients.

By day 33, upper jaw prosthesis in the control group were considered satisfactory due to 2-3 corrections made in

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47 patients. Lower jaw prosthesis were evaluated good as they were corrected once in 16 patients, satisfactory as they were corrected 2-3 times in 26 patients, and poor as they were corrected more than 3 times in 5 patients. In the main group, upper and lower jaw prosthesis were considered as excellent, as none of the 20 patients underwent any correction.

Table 4. The number of corrections made during the period of adaptation to the prosthesis (7 days, 33 days) in the second subgroups of the control and main groups

		Subgroup 2			
		Control		Base	
		Count	Column N %	Count	Column N %
Korol-upper prothesis 7 days	Excellent	0	0,0%	14	70,0%
	Good	14	29,8%	0	0,0%
	Satisfactory	16	34,0%	6	30,0%
	Bad	17	36,2%	0	0,0%
Korol-upper prothesis 33 days	Excellent	0	0,0%	20	100,0%
	Good	0	0,0%	0	0,0%
	Satisfactory	47	100,0%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol-lower prothesis 7 days	Excellent	0	0,0%	7	35,0%
	Good	0	0,0%	3	15,0%
	Satisfactory	28	59,6%	10	50,0%
	Bad	19	40,4%	0	0,0%
Korol-lower prothesis 33 days	Excellent	0	0,0%	20	100,0%
	Good	16	34,0%	0	0,0%
	Satisfactory	26	55,3%	0	0,0%
	Bad	5	10,6%	0	0,0%

As can be seen from the table in the ***third subgroup*** (patients who use CRPP made with "conventional method" for both jaws, but need to renew them), upper jaw prosthesis in the control group by day 7 after treatment were evaluated good as correction was performed only once in 11 patients, satisfactory as correction was performed for 2-3 times in 15 patients, and poor as they were corrected more than 3 times in 17 patients. Lower jaw prosthesis were considered satisfactory in 26 patients due to 2-3 corrections, and poor in 17 patients as correction was performed for more than 3 times. In the main group, upper jaw prosthesis were considered excellent as no correction was performed in 6 patients, good as correction was performed only once in 4 patients, and satisfactory because they were corrected 2-3 times in 10

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patients. Lower jaw prosthesis were considered excellent in 5 patients as no correction was made, good as correction was performed only once in 1 patient, and satisfactory in 14 patients due to 2-3 corrections made.

By day 33, upper jaw prosthesis in the control group were considered satisfactory in 36 patients due to 2-3 corrections performed, and considered bad as corrections were made for more than 3 corrections in 7 patients. Lower jaw prosthesis were evaluated satisfactory as correction was made for 2-3 times in 14 patients, and poor as correction was made for more than 3 times in 29 patients. In the main group, upper and lower jaw prosthesis were considered excellent, as none of the 20 patients underwent correction.

Table 5. The number of corrections made during the period of prosthesis adaptation (7 days, 33 days) in the third subgroups of the control and main groups

		Subgroup 3			
		Control		Base	
		Count	Column N %	Count	Column N %
Korol-upper prothesis 7 days	Excellent	0	0,0%	6	30,0%
	Good	11	25,6%	4	20,0%
	Satisfactory	15	34,9%	10	50,0%
	Bad	17	39,5%	0	0,0%
Korol-upper prothesis 33 days	Excellent	0	0,0%	20	100,0%
	Good	0	0,0%	0	0,0%
	Satisfactory	36	83,7%	0	0,0%
	Bad	7	16,3%	0	0,0%
Korol-lower prothesis 7 days	Excellent	0	0,0%	5	25,0%
	Good	0	0,0%	1	5,0%
	Satisfactory	26	60,5%	14	70,0%
	Bad	17	39,5%	0	0,0%
Korol-lower prothesis 33 days	Excellent	0	0,0%	20	100,0%
	Good	0	0,0%	0	0,0%
	Satisfactory	14	32,6%	0	0,0%
	Bad	29	67,4%	0	0,0%

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IV. DISCUSSION

During SCA, patients seeking orthopaedic treatment with CRPP present a clinical condition consistent with a process of hard tissue resorption and soft tissue atrophy in the prosthetic area. This is because SCA does not develop in a short period of time, but rather during a certain period of the patient's life activities. A patient`s ability to perform various functions (chewing, speaking, swallowing) with prosthesis made during the orthopaedic treatment of SCA depends on the functionality of the prosthesis. The functionality of the prosthesis lies in its fixation to the prosthesis area. The fixation of the prosthesis consists in the fact that the prosthesis does not fall out of its place when the patient is not performing any function (in the state of relative calmness of the jaws). That is, it stands and sticks together. Fixation of the prosthesis depends on its base. The fit of the prosthesis base to the prosthesis area depends on the size determined by the physician.

When preparing a CRPP using any method, the first clinical stage begins with a dental examination and ends with performing anatomical measurements. Then, ***in the conventional method***, the first laboratory stage is to cast a plaster model from the obtained anatomical size and create an individual spoon according to the edges of the prosthesis to be made on the model. In the second clinical stage, a functional measurement is performed with an individual spoon. When taking measurements, the physician applies pressure to the prosthesis area using the measurement material placed on the individual spoon, and tries to keep it in place until the measurement material polymerizes and hardens. At this point, the physicians seem to believe that when the patient uses the CRPP to be prepared, the pressure is exerted by the prosthesis on prosthetic area will be same as indicated by the measurements. However, this is not as accurate.

Conventional method does not allow patients to easily perform the Herbs tests as the physician adjusts the individual spoon to the prosthesis area and takes measurements. In particular, since the individual spoon is controlled by the physician (the physician is an active method, while the patient is a passive method), especially the support of the spoon prevents the mouth from closing. During the measurement, the physician holds the individual spoon by its handle and holds it in the mouth until it becomes polymerized and hardens, as a result, the patient becomes functionally immobilized. Depending on the relief of the prosthesis area, its negative cannot be correctly reflected in the measurement by pressing on the prosthesis area with the measuring material placed on the individual spoon. This is because the pressure changes the position of the tissues around the prosthetic area. Because of this, the edges of the prepared prosthesis are not exact, and correction (cutting of the base edge) occurs due to traumatic injuries.

In our improved method, acrylic base has no such obstacles. At this point, the acrylic-based wax structure of the prosthesis itself is measured to allow the patient to perform all the functional movements to be made with the prosthesis.

In the third clinical stage, when preparing CRPP using our improved method, the measurement is performed with the wax structure of the prosthesis itself, which consists of artificial teeth placed on an acrylic base. In this case, the pressure indicated during the measurement is not the physician`s, but the patient's pressure. A clearer and more accurate representation of the edges of the prosthesis to be made when the functional measurement is taken with the acrylic-based wax structure of the prosthesis, especially that it is not long, eliminates the traumatic effect of the prosthesis during functional movements, there is no need for correction (cutting of the base edge).

During SCA, the pressure on the prosthetic area is different when preparing CCRPP with the conventional and our improved method. It is particularly characterized by the pressure exerted on the prosthesis area when the prosthesis is used for different periods of time. Pressure measurements therefore measuring correspond to the clinical state of the prosthetic area. Therefore, CRPP stabilization in various functions (chewing, speaking, swallowing) directly depends on its fixation. Stabilization of the prosthesis means that it does not fall out of its place when the patient performs various functions (chewing, speaking, and swallowing). If the edges of CRPP as prepared and administered to the patient do not coincide with the edges of the mobile and immobile mucous membrane, the pressure exerted on the artificial teeth during use will cause a traumatic effect through the base. Again, correction will be necessary to remove the traumatic effects.

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Therefore, the functionality of the prosthesis fabricated during the orthopaedic treatment of SCA with CRPP is directly proportional to the number of prosthesis-based corrections due to traumatic injuries.

V. CONCLUSIONS

1. In the second clinical stage, when preparing CRPP using a conventional method and performing a functional measurement with an individual spoon, the physician puts pressure on the prosthetic area with the measuring material placed on the individual spoon, and tries to keep it in that position until the measuring material becomes polymerized and hardened. At this point, the physician seems to believe that when the patient uses the CRPP to be prepared, the pressure applied to the prosthetic area with the prosthesis will be same as indicated by the measurements. However, during the use of the prosthesis, the uneven pressure displaced tissue, requiring correction and compromising functionality of the prosthesis.

2. In the improved method, the functional measurement obtained in the third clinical stage is not pressured by the patient rather than the physician. Since this pressure corresponds to the pressure applied by the patient to the prosthesis when using prepared prosthesis, the functionality of the prosthesis was evaluated as excellent.

3. During the secondary complete adentia, the preparation of complete removable plate prosthesis with the conventional method by performing the functional measurements consists of 5 clinical and 4 laboratory stages, and the preparation with the improvement of the conventional method consists of 4 clinical and 3 laboratory stages. Compared to the conventional method, there are fewer patient visits, no additional time loss for the physicians and the patients, and the prepared prosthesis is more functional.

Clinical Significance.

The conventional method consists of 5 clinical and 4 technical stages. The improvement of the conventional method consists of 4 clinical and 3 technical stages. There is no additional time loss for the physician and the patient and the prepared prosthesis is more functional.

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REFERENCES

[1] Arutyunov, S.D., Ermoliev S.N., Bogatyreva R.M. Monitoring of regional hemodynamics during a physiological chewing test // Stomatologiya.2015:6.42-43.

[2] Nash K.D., Pfeifer D.L., Sodowsky S.J., Carrier D.D. Private Practice of prosthodontists: current conditions of practice in the United States// J.Prosthodont. 2010. 3(19), 175-186.

[3] İordanishvili A.K., Filipova E.V., Libih D.A., Ryzhak G.A. Clinical and functional state of the oral mucosa and tongue in people of older age groups// Institut stomatologii (İn Russ.): 2012: 4(57), 80-81.

[4] Borisenko L.G. Monitoring of the main indicators of dental health// Stomatologii Journal.2004:2.13-15.

[5] İordanishvili A.K., Volkova O.V. Consumption of dentures fixing agents and their impact on the oral mucosa of the prosthetic bed//Stomatology.2020. 2(99), 55-60.

[6] Zhou S.Y., Zhang J.Z., Zhu Y.Q. The effect of form of alveolar ridge on relining of complete dentures// Shanghai Kou Qing Yi Xue. 2009: 3. 271-276

[7] Barkan.I.Yu. Improving the effectiveness of orthopedic treatment of patients in the absence of teeth and difficult anatomical conditions in the lower jaw through a modified design of the denture. Dissertation. Candidate of Medical Sciences.Omsk.2005.- p.14-17.

[8] Jainkittivong A., Aneksuk V., Langlais R.P. Oral mucosal lesions in denture üearers// Gerodontology.2010.1(27),26-32.

[9] Bayramov Y.İ. Functional measurement in orthopedic treatment with full denture//Theoretical & Applied Science/İnternational Scientific Journal/ Philadelphia, USA.2019; 78(10):380-383.

[10] Zheludev S.E. Ways to improve adaptation in persons with problems of intolerance to materials of removable dentures//Maestro of Dentistry.2005:19.6-11.