Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

Functional Comparative Evaluation of a Complete Removable Plate Prosthesis Made by An Improved Method.

Bayramov Y.I.

Orthopedic stomatology department of the Azerbaijan Medical University, Baku, Azerbaijan

Email: ybayramov@amu.edu.az

https://orcid.org/0009-0001-8602-0007

(Received: 27 October 2023 Revised: 22 November Accepted: 26 December)

KEYWORDS

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

ABSTRACT:

Objectives: Comparative evaluation of the functionality of complete removable plate prothesis made by our traditional and improved method during the orthopaedic treatment of secondary complete adentia.

Subjects and methods 211 patients between 45-59 years of age who applied for orthopaedic treatment of secondary complete adentia with complete removable plate prosthesis were involved in the study. 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

Unlike the traditional method, the pressure applied to the functional dimension in the improved method corresponds to the functional pressure made by the patient on the prosthesis during its use. Therefore, during various functions the fixation and stabilization of the prosthesis is not affected, it does not get a traumatic effect and is not corrected.

Conclusions.

1.The fabrication of complete removable plate prothesis with an improved method under functional measurements during secondary complete adentia consists of 4 clinical and 3 laboratory stages. There is no additional time loss for the physician and patient compared to the conventional method.

2. The functional measurement obtained with the improved method is not pressured by the physician, but by the patient himself. This pressure corresponds to the pressure exerted by the patient on the prosthesis during its use.

Clinical Significance.

Preparation of CRPP is the main orthopaedic treatment method of SCA. The conventional method consists of 5 clinical and 4 laboratory stages. The improvement of the conventional method consists of 4 clinical and 3 laboratory stages. There is no additional time loss for the physician and the patient and the prepared prosthesis is more functional.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

Introduction.

Secondary complete adentia (SCA) is the loss of all teeth in the oral cavity, i.e. tooth extraction due to dental caries and its complications. SCA occurs gradually [1].

Therefore, when the teeth are lost, the patient is either treated with a fixed (non-removable) prosthetic structure, or no orthopaedic treatment is given until the all teeth are lost. In these cases, the patient adapts to the current clinical situation. The patient`s age and the duration of SCA complicate this adjustment. At this point, nutrition and speech function are hampered. Impaired function results in the resorption of the hard tissues of the upper and lower jaw and the soft tissue atrophy [2-3].

Even before SCA appears in the oral cavity, teeth are known to be located in the neutral zone above the alveolus. This neutral zone is the place where the pressure of the tongue on the inside is balanced by the pressure of the cheek and lip on the outside of the tooth.

The main orthopaedic treatment in SCA is known to be the fabrication of a complete removable plate prosthesis (CRPP). The CRPP structure consists of an acrylic base and artificial teeth placed on it. The acrylic base replaces the hard and soft tissues lost in the prosthetic area, and the artificial teeth should replace the same teeth [4].

The fitting feature of the CRPP in the oral cavity directly depends on its fixation and stabilization. Prosthesis fixation occurs when the patient is not performing any function, especially when the jaws are relatively stationary, the prosthesis hangs and clings to the prosthesis area. Stability of the prosthesis refers that the patient does not move or only minimally when performing the function [5-6].

The method of fabricating the prosthesis has a special impact on the fixation and stabilization of the prosthesis and the patient's tooth loss duration. The developed CRPP requires patients to perform vital functions such as eating and speaking. Violation of prosthesis fixation and stabilization during the performance of various functions causes traumatic injury to the prosthesis area and surrounding tissues. The pain originated from the resulting injury causes discomfort and prevents or precludes the use of the prosthesis [7-8]. This compromises the function of the prosthesis with complete removable plates.

The study ***aims*** to evaluate the function of complete removable plate prosthesis made by applying the traditional and our improved methods.

Subjects and methods

A total of 211 patients, 106 (50.2%) men and 105 (49.8%) women, aged 45-59 years, who applied for orthopaedic treatment of SCA with CRPP, were included in the study. In examining patients with SCA, special attention was paid to the shape and extent of atrophy of the alveolar ridge, the localization of atrophy and the condition and degree of mobility of the oral mucosa. The extent of atrophy and resorption of the soft and hard tissues of the prosthesis area was evaluated according to the Supple and I.M.Oxman classifications.

According to Supple classification:

Type 1 - mucous membrane of regular mobility and colour, firmness, moderate elasticity, normal moisture, light pink colour - ***ideal basis***

Type 2 - immobile, atrophied, dry and bluish-coloured, thin, pale mucous membrane with poorly elasticity - ***stiff prosthetic basis***

Type 3 - loose, detached, hyperaemic, often catarrhal inflamed, hypertrophied and pink mucosa with proper mobility and displacement - ***soft basis***

Type 4 - presence of a moving part at the top of the alveolar ridge of the transitional fold, presence of a part that moves to either side at the top of the alveolar ridge, the type of mucous membrane that is sometimes compressed between the jawbones and the prosthesis during the use of the prosthesis is noted.

According to I.M.Oxman classification:

Type 1 – arrangement of well-preserved alveolar ridge, high alveolar ridge, distinct maxillary ridge, deep palatal arch, and high transitional fold.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

Type 2 - moderate atrophy of the same level, moderate atrophy of the alveolar ridge and maxillary ridge, moderate depth of the palatal arch and transitional fold.

Type 3 - complete atrophy of the same level, acutely expressed, atrophy of the alveolar ridge of the equal level and maxillary ridge, shallow palatal arch, fusion of lower lip, tongue, and cheek straps to the cheek and tongue.

Type 4 - uneven atrophy, uneven atrophy of the alveolar ridge, observed in the lower jaw, especially on the sides of the mandible.

For to the purpose of the study, the results obtained will be analysed in three subgroups depending on the dental status. Therefore, patients in the ***first subgroup*** were not orthopedically treated with CRPP due to SCA.

		Subgroup 1			
		Control		Base	
		Count	Column N %	Count	Column N %
Gender	Male	27	55,1%	16	50,0%
	Female	22	44,9%	16	50,0%
Upper jaw Oxman	type 1	21	42,9%	13	40,6%
	type 2	12	24,5%	10	31,3%
	type 3	9	18,4%	1	3,1%
	type 4	7	14,3%	8	25,0%
Lower jaw Oxman	type 1	19	38,8%	8	25,0%
	type 2	15	30,6%	15	46,9%
	type 3	4	8,2%	6	18,8%
	type 4	11	22,4%	3	9,4%
Upper jaw Supple	type 1	21	42,9%	13	40,6%
	type 2	12	24,5%	10	31,3%
	type 3	7	14,3%	8	25,0%
	type 4	9	18,4%	1	3,1%
Upper jaw Supple	type 1	19	38,8%	8	25,0%
	type 2	15	30,6%	15	46,9%
	type 3	11	22,4%	3	9,4%
	type 4	4	8,2%	6	18,8%

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

The second subgroup of patients had a "conventional method" CRPP in both jaws. During orthopaedic treatment, CRPP were prepared in a conventional manner, but they did not use it for a single day due to reasons such as pain, poor fixation, inability to chew food and speech impairment.

		Subgroup 2			
		Control		Base	
		Count	Column N %	Count	Column N %
Gender	Male	22	46,8%	10	50,0%
	Female	25	53,2%	10	50,0%
Upper jaw Oxman	type 1	19	41,3%	9	45,0%
	type 2	10	21,7%	5	25,0%
	type 3	12	26,1%	3	15,0%
	type 4	5	10,9%	3	15,0%
Lower jaw Oxman	type 1	15	31,9%	7	35,0%
	type 2	14	29,8%	7	35,0%
	type 3	8	17,0%	3	15,0%
	type 4	10	21,3%	3	15,0%
Upper jaw Supple	type 1	19	40,4%	9	45,0%
	type 2	10	21,3%	5	25,0%
	type 3	6	12,8%	3	15,0%
	type 4	12	25,5%	3	15,0%
Upper jaw Supple	type 1	15	31,9%	7	35,0%
	type 2	14	29,8%	7	35,0%
	type 3	10	21,3%	3	15,0%
	type 4	8	17,0%	3	15,0%

The third subgroup of patients had a CRPP due to SCA, an orthopaedic CRPP made by traditional methods and used for more than three years, therefore, it was considered inadequate, its use caused difficulties, and it needs to be renewed.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

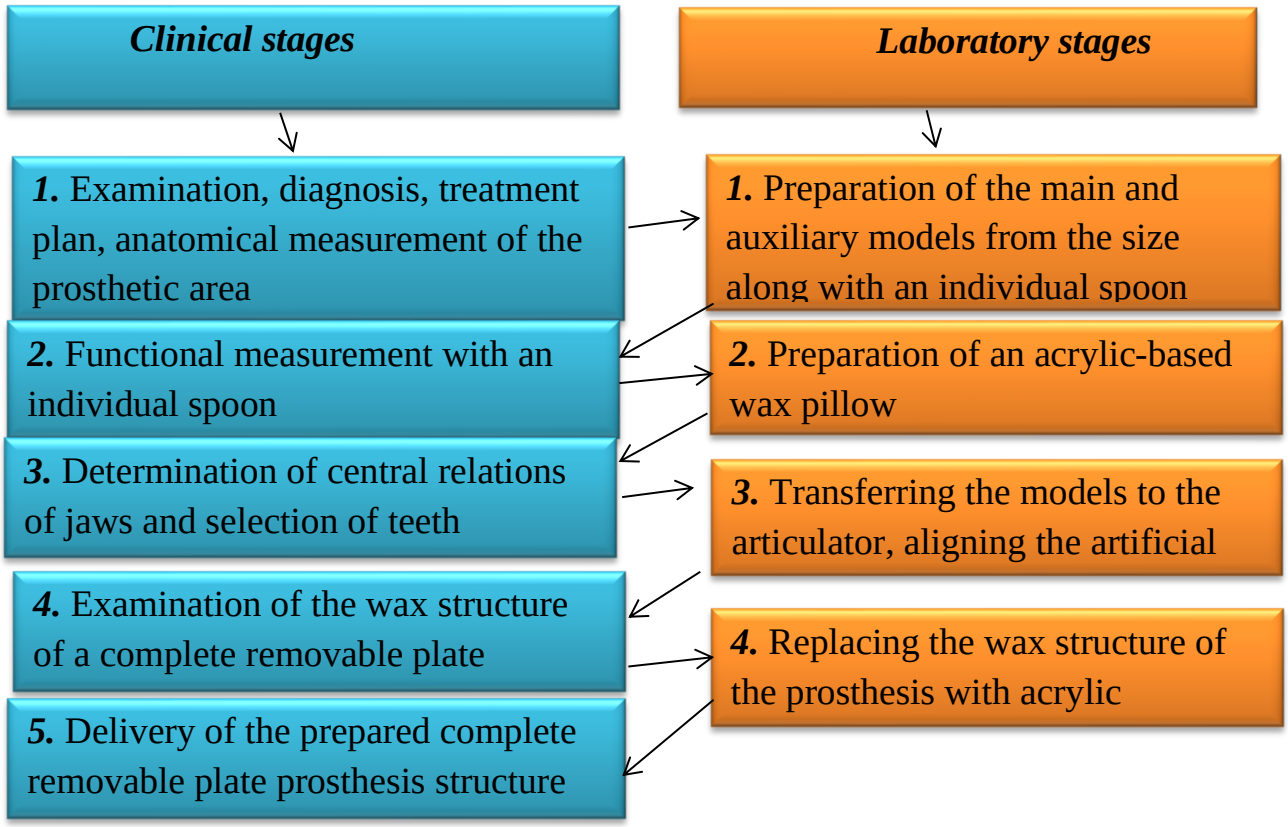
		Subgroup 3			
		Control		Base	
		Count	Column N %	Count	Column N %
Gender	Male	21	48,8%	10	50,0%
	Female	22	51,2%	10	50,0%
Upper jaw Oxman	type 1	12	27,9%	6	30,0%
	type 2	14	32,6%	4	20,0%
	type 3	7	16,3%	6	30,0%
	type 4	10	23,3%	4	20,0%
Lower jaw Oxman	type 1	9	20,9%	5	25,0%
	type 2	17	39,5%	6	30,0%
	type 3	8	18,6%	4	20,0%
	type 4	9	20,9%	5	25,0%
Upper jaw Supple	type 1	12	27,9%	7	35,0%
	type 2	14	32,6%	3	15,0%
	type 3	10	23,3%	4	20,0%
	type 4	7	16,3%	6	30,0%
Upper jaw Supple	type 1	9	20,9%	5	25,0%
	type 2	17	39,5%	6	30,0%
	type 3	9	20,9%	5	25,0%
	type 4	8	18,6%	4	20,0%

In the control group, CRPPs were prepared by the well-known traditional method, and in the main group, by our improved method. Clinical and laboratory stages of CRPP preparation applying the traditional method.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727



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 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.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

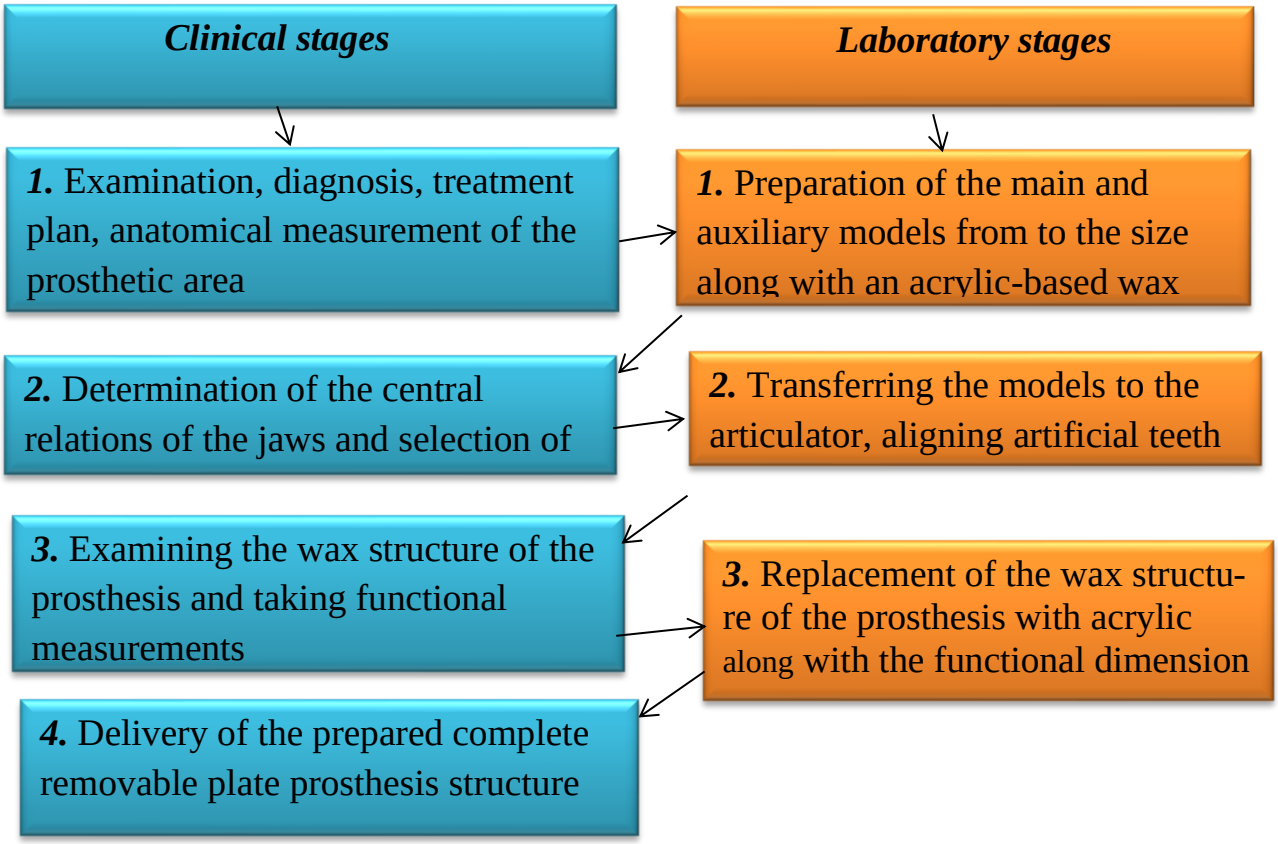
Laboratory stage 3: Mounting the model to the articulator, aligning the artificial teeth and preparing the acrylic-based temporary prosthesis.

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

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



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

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

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 [9].

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.

Results

As can be seen from the table of ***the first subgroup*** (patients who did not receive orthopaedic treatment with CRPP for SCA), no corrections were noted in the upper jaw prothesis in the main group after application of the improved method to prothesis patients. In the case of mandibular prothesis, correction was performed on all but 6 prothesis until the 7th day of applying the prothesis. After 33 days, 6 months, 12 months, 24 months, 36 months after the patient`s use, no correction was conducted on prothesis. Corrections were performed on all the upper jaw prothesis except for 33 of them within 6 months, 30 of them within 12 months, and 33 of them within 24 months in the control group. As for lower jaw prothesis, correction was performed on all but 2 until 33th days of its use, 23 within 6 months, 32 within 12 months, and 14 within 24 months.

		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%

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

	Satisfactory	30	61,2%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol-upper prothesis 6 months	Excellent	33	67,3%	32	100,0%
	Good	15	30,6%	0	0,0%
	Satisfactory	1	2,0%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol-upper prothesis 12 months	Excellent	30	61,2%	32	100,0%
	Good	18	36,7%	0	0,0%
	Satisfactory	1	2,0%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol-upper prothesis 24 months	Excellent	33	67,3%	32	100,0%
	Good	14	28,6%	0	0,0%
	Satisfactory	2	4,1%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol-upper prothesis 36 months	Excellent	0	0,0%	32	100,0%
	Good	18	36,7%	0	0,0%
	Satisfactory	31	63,3%	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%
Korol- lower prothesis 6 months	Excellent	23	46,9%	32	100,0%
	Good	17	34,7%	0	0,0%
	Satisfactory	9	18,4%	0	0,0%

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

	Bad	0	0,0%	0	0,0%
Korol- lower prothesis 12 months	Excellent	32	65,3%	32	100,0%
	Good	13	26,5%	0	0,0%
	Satisfactory	4	8,2%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol- lower prothesis 24 months	Excellent	14	28,6%	32	100,0%
	Good	3	6,1%	0	0,0%
	Satisfactory	32	65,3%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol- lower prothesis 36 months	Excellent	0	0,0%	32	100,0%
	Good	0	0,0%	0	0,0%
	Satisfactory	44	89,8%	0	0,0%
	Bad	5	10,2%	0	0,0%

In the second subgroup (those with CRPP made with "conventional method" for both jaws and did not use it) as can be seen from the table, after the treatment, no cases of correction of upper jaw prothesis were noted in the main group after the prothesis prepared with the improved method were applied by the patients. As for the lower jaw prothesis, correction was performed on all but 7 prothesis until the 7th day of its use by the patient. After 33 days, 6 months, 12 months, 24 months, 36 months after being put into use by patients, no correction was carried out on prothesis. In the control group, as for the upper jaw prothesis, correction was performed on all except for 20 prothesis within 6 months, and 19 of them within 12 months. There was no lower jaw prothesis that was not corrected, correction was conducted on all of the prothesis.

		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%

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

	Good	0	0,0%	0	0,0%
	Satisfactory	47	100,0%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol-upper prothesis 6 months	Excellent	20	42,6%	20	100,0%
	Good	21	44,7%	0	0,0%
	Satisfactory	6	12,8%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol-upper prothesis 12 months	Excellent	19	40,4%	20	100,0%
	Good	22	46,8%	0	0,0%
	Satisfactory	6	12,8%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol-upper prothesis 24 months	Excellent	0	0,0%	20	100,0%
	Good	5	10,6%	0	0,0%
	Satisfactory	42	89,4%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol-upper prothesis 36 months	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%
Korol- lower prothesis 6 months	Excellent	0	0,0%	20	100,0%
	Good	10	21,3%	0	0,0%

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

	Satisfactory	37	78,7%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol- lower prothesis 12 months	Excellent	0	0,0%	20	100,0%
	Good	24	51,1%	0	0,0%
	Satisfactory	23	48,9%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol- lower prothesis 24 months	Excellent	0	0,0%	20	100,0%
	Good	5	10,6%	0	0,0%
	Satisfactory	25	53,2%	0	0,0%
	Bad	17	36,2%	0	0,0%
Korol- lower prothesis 36 months	Excellent	0	0,0%	20	100,0%
	Good	0	0,0%	0	0,0%
	Satisfactory	20	42,6%	0	0,0%
	Bad	27	57,4%	0	0,0%

In the third subgroup (patients who use CRPP made with "conventional method" for both jaws, but need to renew them) as can be seen from the table, after the treatment, after the prothesis made by the means of the improved method were given to patients` use, correction was performed on all but 6 prothesis of the upper jaw in the main group until the 7th day. During 33 days, 6 months, 12 months, 24 months, 36 months after the use of the patients, no correction was carried out on any upper jaw prothesis. As for the lower jaw prothesis, correction was performed on all but 5 prothesis until the 7th day of its use. During 33 days, 6 months, 12 months, 24 months, 36 months after its use by patients, no correction was performed on the lower jaw prothesis. In the control group, corrections were performed on all the upper jaw prothesis except for 6 of them within 6 months, and 11 prothesis within 12 months. No lower jaw prothesis was corrected, several corrections were performed on all of the prothesis.

		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%

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

	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-upper prothesis 6 months	Excellent	6	14,0%	20	100,0%
	Good	25	58,1%	0	0,0%
	Satisfactory	12	27,9%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol-upper prothesis 12 months	Excellent	11	25,6%	20	100,0%
	Good	24	55,8%	0	0,0%
	Satisfactory	8	18,6%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol-upper prothesis 24 months	Excellent	0	0,0%	20	100,0%
	Good	0	0,0%	0	0,0%
	Satisfactory	28	65,1%	0	0,0%
	Bad	15	34,9%	0	0,0%
Korol-upper prothesis 36 months	Excellent	0	0,0%	20	100,0%
	Good	0	0,0%	0	0,0%
	Satisfactory	43	100,0%	0	0,0%
	Bad	0	0,0%	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%

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

Korol- lower prothesis 6 months	Excellent	0	0,0%	20	100,0%
	Good	9	20,9%	0	0,0%
	Satisfactory	34	79,1%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol- lower prothesis 12 months	Excellent	0	0,0%	20	100,0%
	Good	12	27,9%	0	0,0%
	Satisfactory	31	72,1%	0	0,0%
	Bad	0	0,0%	0	0,0%
Korol- lower prothesis 24 months	Excellent	0	0,0%	20	100,0%
	Good	0	0,0%	0	0,0%
	Satisfactory	15	34,9%	0	0,0%
	Bad	28	65,1%	0	0,0%
Korol- lower prothesis 36 months	Excellent	0	0,0%	20	100,0%
	Good	0	0,0%	0	0,0%
	Satisfactory	19	44,2%	0	0,0%
	Bad	24	55,8%	0	0,0%

Diskuccion

A patient`s ability to perform various functions (chewing, talking, swallowing) with the prosthesis fabricated during the orthopaedic treatment of SCA with CRPP depends on the functionality of the prosthesis. The functionality of the prosthesis consists of its fixation and stabilization in the prosthetic area. Prosthesis fixation-when the patient does not perform any function (in the state of relatively stationary jaws), the prosthesis does not fall out of its place, here the prosthesis area. That is, it stands and sticks together. Fixation of the prosthesis is associated with its base. The fit of the prosthesis base to the prosthesis area depends on the size taken by the physician. Prosthesis stabilization-when the patient performs various functions (chewing, talking, swallowing), the prosthesis does not fall out of its place - the prosthesis area. However, during the SCA, patients who applied for orthopaedic treatment with CRPP exhibit a clinical condition corresponding to the process of prosthesis hard tissue resorption and soft tissues atrophy. This is because SCA is not formed in a short period of time, but during a certain period of the patient's life activities. Identifying such a clinical condition in the jaws according to I.M.Oxman and Supple's classification facilitates orthopaedic treatment planning. Therefore, pressure measurements correspond to the clinical state of the prosthetic area. During the SCA, the pressure applied to the prosthetic area is different when preparing CRPP with conventional and improved methods. This is particularly characterized by the pressure exerted on the prosthesis area during its use for different periods of time.

In the second clinical stage, when preparing CRPP with the conventional method, functional measurements are performed with an individual spoon. During the measurement, the physician applies pressure on the prosthesis area with the measurement material placed on the individual spoon and tries to hold it in this position until the measurement material polymerizes and it hardens. At this

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

point, the physician seems to think that when the patient uses the CRPP to be prepared, the pressure exerted by the prosthesis on the prosthetic area will be equal to the pressure indicated by the measurements. However, this is accurate.

In the conventional method, the patient cannot easily perform the Herbs test when the doctor adjusts the individual spoon to the prosthesis area and takes measurements. Since the individual spoon is under the control of the physician, particularly the support of the spoon is hindered. During the measurement, the physician holds an individual spoon by its handle, insert the spoon to patient`s mouth and keeps it there until measuring material becomes polymerized and it hardens, preventing the patient from performing free functional movements. Because of this, the borders of the prosthesis are not accurate, corrections are performed on them for 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, allowing the patient to perform all the functional movements with the prosthesis to be fabricated.

In the third clinical stage, in the preparation of CRPP applying our improved method, measurements are taken with the wax structure of the prosthesis, which consists of artificial teeth placed on an acrylic base. In this case, the pressure displayed during the measurement is not the physician`s, but the patient's pressure. A clearer and more accurate reflection of the borders of the prosthesis to be made when the prosthesis is functionally measured with an acrylic-based wax structure, particularly when it is not long, reduces the traumatic effect of the prosthesis during functional movements, and there is no need for correction.

Stabilization of CRPP directly depends on its fixation. If the borders of the CRPP prepared and put into use of the patient do not correspond to the border of the mobile and immobile mucous membrane, the pressure on the artificial teeth during the function will have a traumatic effect via the base. Again, correction will be required to eliminate the traumatic effect.

Therefore, the functionality of the prosthesis prepared during the orthopaedic treatment of SCA with CRPP is directly proportional to the correction made on the prosthesis base due to traumatic injuries.

Conclusions.

1.The fabrication of complete removable plate prothesis with an improved method under functional measurements during secondary complete adentia consists of 4 clinical and 3 laboratory stages. There is no additional time loss for the physician and patient compared to the conventional method.

2. The functional measurement obtained with the improved method is not pressured by the physician, but by the patient himself. This pressure corresponds to the pressure exerted by the patient on the prosthesis during its use.

Clinical Significance.

Preparation of complete removable plate prosthesis is the main orthopaedic treatment method of secondary complete adentia. The conventional method consists of 5 clinical and 4 laboratory stages. The improvement of the conventional method reduces the number of patient visits to the clinic since it consists of 4 clinical and 3 laboratory stages. There is no additional time loss for the physician and the patient and the prepared prosthesis is more functional.

Acknowledgement.

I would like to thank all the prosthetists who helped to carry out this work.

Conflict of interests. None.

Funding. None.

REFERENCES

[1] Douglass C.W., Shih A., Ostry L. Will there be a need for complete dentures in the United States in 2020//J.Prosthet Dent.2002.1(87),5-8.

[2] İordanishvili A.K. Mental health when using removable dentures// Klinicheskaya stomatologiya(İn Russ.): 2018: 1(85), 64-67.

[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.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14 (1), 1287-1302 | ISSN:2251-6727

[4] Mersel A. İmmediate or transitional complete dentures: gerodontic considerations//İnt. Dent.J. 2002. 4(52),298-303.

[5] Ogawa T., Sato Y., Kitagawa N., Nakatsu M. Relationship between retention forces and stress at the distal border in maxillary complete dentures:Measurement of retention forces and finite-element analysis in individual participants // J. Prosthet Dent. 2017. 4(117), 524-531.

[6] 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.

[7] Huumonen S., Haikola B., Oikarinen K., Söderholm A.L., Remes-Lyly T., Sipilä K. Residual ridge resorption, lower denture stability and subjective complaints among edentulous individuals // J. Oral Rehabil.2012. 39(5), 384-390.

[8] Jagger, D.C. Review: The reinforcement of dentures /D.C. Jagger, A. Harrison, K.D. Jandt // J. Oral Rehabil. 2008. №26, 185.

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

[11] 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.

[12] 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.

[13] Lugansky V.A. Optimization of clinical and laboratory stages of obtaining impressions in the absence of teeth: Dissertation. Candidate of Medical Sciences.Yekaterinburg. 2006.-p.75-78.

[14] Savvidi K.G. Optimization of methods of orthopedic treatment of elderly patients with complete loss of teeth: Dissertation. Candidate of Medical Sciences. Tver. 2011.-p.67-71.