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CLINICAL APPROBATION OF THE METHOD OF PROTECTING THE RECEPTOR APPARATUS OF THE TEETH AT THE STAGES OF TREATMENT WITH NON-REMOVABLE PROSTHESIS DESIGNS

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The article presents the results of clinical approbation of our proposed method for protecting the receptor apparatus of teeth with the help of a complex of preparations of the domestic light-curing adhesive and anti-homo-toxic drug «Traumeel», the application of which is substantiated by experimental studies in laboratory animals. The positive results of our method in the clinic are confirmed by the analysis of the data of the electrodontometry and the values of the chewing pressure measured by the method proposed by us on the day of the study, a next day, in a month and in a year after the stumps of the intact teeth were coated with the proposed our method. When assessing the data obtained, it was found that, in the study group, compared with the control, the indicators of electrodontometry on day of study, every other day, one month and one year after the study, there were no significant changes in indices compared to the control group, the same applies to the data of the masticatory pressure in above proposed periods of study. Analyzing the obtained results, we can say that our method has a significant advantage of our method of protecting the stumps of preparating intact teeth at the stages of treatment with non-removable prosthesis designs and promotes to the prevention of complications of the hard tissue preparation operation.

Keywords: receptor apparatus, intact teeth, electroodontometry, chewing pressure, protection technique, light- curing adhesive, anti-homo-toxic drug.

At present, the most commonly used prosthesis constructions are one-piece-cast facing with plastic or ceramics, but for the manufacture of these structures, the number of cases of extract pulp of intact teeth that are supporting, significantly, regardless of the initial state of these teeth, has significantly increased. The reason for this is the desire of orthopedic dentists to avoid possible complications in the preparation of hard tissues, which is associated with the discovery and possible damage to the tubes of dentin and, as a consequence, the disturbance of hydrodynamic processes in the processes of odontoblasts. Depending on the removed layer of dentin, it is also possible to start compensatory mechanisms. But it also depends on the volume of tissues prepared, the time interval that has passed after the intervention [1, 2].

But these protective reactions do not always start. Therefore, the first stage of preparation of teeth for prosthetics is the stage of extract of pulp of teeth. But, research to proved that this manipulation significantly reduces the strength of dentin, which is the reason of frequent damage of the crown parts of teeth after prosthetics and a decrease in sustainability and resistance to chewing pressure during the functional load.

To preserve the teeth intact and prevent the negative consequences the extract of pulp by many scientists, various methods and methods for preservation the vitality of the pulp of supporting teeth and reducing their sensitivity after the operation preparation were proposed. According to these methods, the stumps of the prepared teeth were covered with various materials, provisional crowns, which were fixed onto single- and multicomponent pastes. But not one of the proposed methods did not lead to the restoration, damaged during the preparation of hard tissues, the processes of odontoblasts, which are part of the mechanoreceptors of the pulp teeth [3, 4].

In connection with the foregoing and taking into account the relevance and practical importance of this issue, we proposed a method that was tested in the clinical practice of orthopedic dentistry.

The purpose of our study was the clinical confirmation of the experimentally obtained results of using for the protection of the receptor apparatus of the teeth a complex of anti-homo-toxic drug «Traumeel» and a domestic light-curing adhesive.

Materials and methods of the research: the method was tested in 72 patients, 57 of which were basic, and 15 control group, which were divided into 3 subgroups by age. Prepared for supporting elements of non-removable one-piece-cast denture of 200 teeth. The stump of teeth which were processed according to our method and consist of the following steps: they perform an injection infiltration anesthesia, preferring an

intraligamentary one using anesthetics of the articaine series such as Septanest, Ultracain, with the addition of epinephrine 1:100,000 or 1:200,000 depending on the clinical case. Prepared the hard tooth tissues with a centered and sharp abrasive tool with water-cooling and a speed of 300,000 revolutions per second. After preparation with etching gel, the stumps of the teeth are covered for 20–30 seconds, removing the lubricated layer. This significantly contributes to the penetration of medicinal substances into the dentin tubules. Then the gel is washed off with a stream of water, isolate the stump of the tooth with a cotton wool from the oral liquid, and if necessary, additionally use saliva suction, dry the stump of the tooth with a warm air stream. Apply an applicator to the surface of the stump anti-homo-toxic drug «Traumeel». It is evenly distributed over the surface of the stump of the tooth with a jet of warm air. Then, with the help of an applicator, a domestic light-curing adhesive is applied over the anti-homo-toxic preparation. To remove the remnants of the drug use a jet of warm air. After that, the adhesive is polymerized for 20 seconds. To reduce the effect of the environment on the stump of the prepared tooth, fix the temporary crowns on the water dentine, which were made before the moment of preparation of the teeth directly at the chair of the patient with the help of GNJ Tempo lux material according to the standard methods.

For clinical confirmation of the results of experimental research, the parameters of electrodontometry (EO) and chewing pressure (VT) were measured according to the method proposed by us (patent 35288) [5] before the operation of preparation, after the anesthesia has ended and in a month after preparation.

Results of the research. The analysis of the measurement data was carried out: the indicators of electrodontometry and chewing pressure during the clinical study of the experimental and control groups of patients. Analysis of the data is aimed at determining the dynamics of indicators (EO and CP), which arise after the operations of preparation of hard tissues of teeth, as well as the effectiveness of our proposed methodology for monitoring. The reasons that influence the positive, and can also, negative changes are established. For the reliability of the analysis results, the ANOVA method was implemented in the SAS software package. Regression analysis implemented in the STATISTICA software package [6].

When analyzing the EO data from *Table 1*, it can be seen that the parameters in the study group before the operation of preparation, in day and in a month after using our method, remained practically unchanged or slightly increased and did not depend on the tooth type.

Table 1. Indicators of electroodontometritis in мА

Group	Index	Incisors			Canines			Premolars			Molars		
		Before	In day	Month	Before	In day	Month	Before	In day	Month	Before	In day	Month
Study	M	3,24	2,21	3,34	4,10	2,85	3,95	4,36	3,06	4,42	5,20	3,74	5,65
	м	0,09	0,09	0,15	0,23	0,21	0,25	0,15	0,12	0,14	0,16	0,18	0,24
		P1 <0,001		P2> 0,05	P1< 0,001		P2> 0,05	P1 < 0,001		P2> 0,05	P1< 0,001		P2> 0,05
Control	M	3,22	2,67	6,22	4,75	3,50	5,25	4,20	2,93	6,07	4,83	3,89	6,89
	м	0,15	0,24	0,76	0,48	0,50	0,48	0,20	0,16	0,36	0,22	0,14	0,62
		P1< 0,05		P2< 0,001	P1< 0,001		P2< 0,001	P1< 0,001		P2< 0,001	P1< 0,05		P2< 0,001

P1 – probability between research before preparation and after in day after preparation;
P2 is the probability between the study before the preparation and in one month after the preparation

Both in the study group and in the control group, the EO values after the preparation are reduced almost by the same amount (with the exception of the incisors). But in a month the picture changes significantly. If for the studied group the EO indicators remain the same as they were before the preparation, a significant increase in this index is observed in the control group, the difference between the control group and the control for practically all anatomically oriented teeth (excluding canines) is statistically significant.

Analyzing the average values of the value of the data of the study group, it can be seen that after the experimental processing of the teeth in 84.96% of the vips, the EO indicators did not increase. In 13.54% of cases there is a slight increase in this indicator and only in 1.5% of cases – probably increased, which can be interpreted as a complication.

In the control group, unlike the study only in 20% of cases, the EO index did not increase, and a significant increase in 23.3% of cases that can be interpreted as a complication, and in 56.7% of cases, the indices changed by 1–2 units from benchmarks. Draws attention to that the spread of data in the control group is more than twice that in the study group. This indicates a much less confidence in the results of the control processing.

In the study group of cases with complication, there were only 2, which is 1.5% of the total number of teeth processed by our method. At the same time, in the control group of complicated cases there were 14 that is 23.3% of the number of teeth study (*Fig. 1*).

The average value (M) of the chewing pressure (VT) and the standard error of the mean (m), obtained during clinical research, by patient groups and by anatomically oriented groups of teeth, are given in *Table 2*.

When analyzing the measurements of CP (from Table 2) in the study group do not depend on the type of tooth and significant changes in the indicators were not observed.

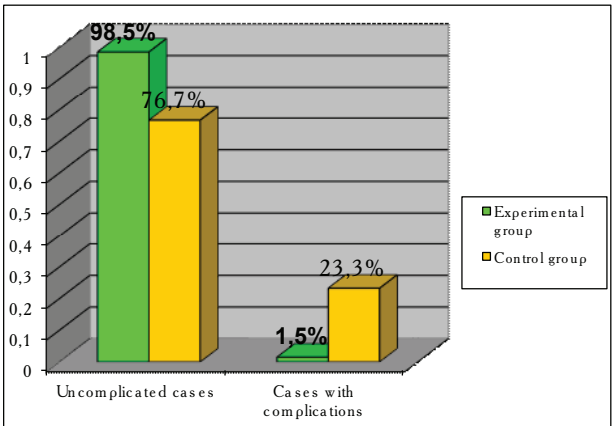

Fig. 1. Comparison of the proportion of uncomplicated and complicated cases of tooth preparation in the studied and control groups.

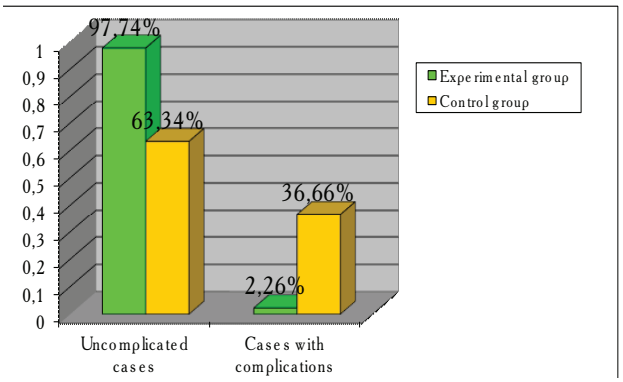

Fig. 2. Comparison of the data of chewing pressure to a part of uncomplicated and complicated cases of tooth preparation in the study group and control

Table 2. Chewing pressure indicators in pF

Group	Index	Incisors			Canines			Premolar			Molar		
		Before	In day	Month	Before	In day	Month	Before	In day	Month	Before	In day	Month
Study	M	10,79	12,79	11,41	14,10	16,15	14,40	18,44	20,53	19,00	31,66	33,97	32,63
	м	0,23	0,26	0,40	0,46	0,47	0,47	0,39	0,39	0,38	0,59	0,57	0,61
		P<0,001		P>0,05	P<0,001		P>0,05	P<0,001		P>0,05	P<0,01		P>0,05
K	M	10,22	12,55	13,44	15,00	17,55	16,75	18,89	21,83	22,00	33,00	35,67	36,27
	м	0,60	0,63	0,69	0,71	0,75	1,11	0,35	0,36	0,40	0,46	0,47	0,65
		P<0,01		P<0,01	P<0,05		P<0,05	P<0,001		P<0,001	P<0,001		P<0,001

P1 – probabilities between the study before preparation and in the day after preparation;
P2 – the probability between study before preparation and in a month after preparation

Analysis of the CP data from Table 2 shows that the increase in this index on the next day after processing compared to the value in the research and control groups is statistically significant not only for the incisors and canines. In premolars and molars, this increase in the control group is significantly greater than in the experimental group.

In the experimental group, in 55.64% of cases in a month after processing, the CP indicators did not increase. In 42.1% of cases, this indicator was observed to increase by 1–2 pF and only in 2.26% of cases-growth by 4 pF and more, which can be interpreted as complications.

In the control group, unlike the only study in 3.33% of cases, the CP index did not increase, and a significant increase (4 pF and more) could be interpreted as complications observed in 36.66% of cases (*Fig. 2*).

Conclusions

1. Using the method of protection of the supporting teeth stumps proposed by us, the data of EO and CP in more than 50% of cases remained at the same level in one month after preparation as before the preparation and did not depend on the anatomical orientation of the tooth.

2. In the control group, where our methods was not applied, the same indicators sharply increased in a month and the anatomical affiliation of the tooth was important.

Thereby, we can see a significant advantage of our method of protecting stumps of preparation intact teeth at the stages of treatment with non-removable designs denture. This makes it possible to use our method of protecting the supporting teeth in the wide practice of the orthopedic dentist and will significantly increase the use of orthopedic non-removable denture and help prevent complications in the preparation of hard tissues.

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КЛІНІЧНА АПРОБАЦІЯ МЕТОДУ ЗАХИСТУ РЕЦЕПТОРНОГО АПАРАТУ ЗУБІВ НА ЕТАПАХ ЛІКУВАННЯ ЗА ДОПОМОГОЮ НЕЗНІМНИХ КОНСТРУКЦІЙ ПРОТЕЗІВ

У статті представлені клінічні результати удосконаленої методики захисту клітинних структур відпрепарованих зубів на етапах лікування незнімними конструкціями протезів заснованої на використанні поєднання антигомотоксичного препарату Траумель і нового вітчизняного світлотвердіючого адгезиву «Дентазив». Проведений аналіз даних досліджень електроодонтометрії (ЕО) і жувального тиску (ЖД) (за розробленою і запатентованою нами методикою), яке витримують опорні зуби до операції препарування твердих тканин, після застосування нашої методики та через місяць. Методика, що була використана нами для захисту зубів, базується на гістологічних даних. З отриманих результатів видно, що в тих групах пацієнтів, де була використана запропонована нами методика захисту кукс опорних зубів дані ЕО і ЖТ більш ніж в 50% випадків залишалися на тому ж рівні через місяць, після препарування і до операції препарування та не залежно від анатомічної орієнтації зубів. А в контрольній групі, де не була застосована наша методика, ті ж самі показники різко збільшувалися через місяць і мала значення анатомічна приналежність зуба. Найбільше збільшення зазначених показників спостерігалося у різців, потім у іклів, премолярів і найменше у молярів.

Висновки: на підставі клінічних досліджень, видно позитивне значення нашого методу захисту кукс відпрепарованих інтактних зубів на етапах лікування незнімними конструкціями протезів, що дає можливість для широкого використання в повсякденній практиці лікаря ортопеда-стоматолога.

Ключові слова: методика, захист, клітинні структури, зуб, Траумель і «Дентазив» адгезив.

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КЛИНИЧЕСКАЯ АПРОБАЦИЯ МЕТОДА ЗАЩИТЫ РЕЦЕПТОРНОГО АППАРАТА ЗУБОВ НА ЭТАПАХ ЛЕЧЕНИЯ С ПОМОЩЬЮ НЕСЪЕМНЫХ КОНСТРУКЦИЙ ПРОТЕЗОВ

В статье представлены клинические результаты усовершенствованной методики защиты клеточных структур отпрепарированных зубов на этапах лечения несъемными конструкциями протезов основанной на использовании сочетания антигомотоксичсекого препарата Траумель и нового отечественного светоотверждаемого адгезива «Дентазив». Проведен анализ данных исследований электроодонтометрии (ЭО) и жевательного давления (ЖД) по разработанной и запатентованной нами методике, которое выдерживают опорные зубы до операции препарирования твердых тканей, после применения нашей методики через месяц. Используемая методика защиты зубов базируется на гистологическим данных. Из полученных результатов видно, что в тех группах пациентов, где была использована предложенная нами методика защиты культей опорных зубов данные ЕО и ЖТ более чем в 50% случаев оставались на том же уровне через месяц после препарирования и до операции препарирования не зависимо от анатомической ориентации зубов. А в контрольной группе, где не была применена наша методика, те же самые показатели резко увеличивались через месяц и имело значение анатомическая принадлежность зуба. Наибольшее увеличение указанных показателей наблюдалась у резцов, потом у клыков, премоляров и меньше всего у моляров.

Выводы: на основании клинических исследований, видно позитивное значение нашего метода по защите культей отпрепарированных интактных зубов на этапах лечения несъемными конструкциями протезов, что дает возможность для широкого его использования в повседневной практике врача ортопеда-стоматолога.

Ключевые слова: методика, защита, клеточные структуры, зуб, Траумель и «Дентазив» адгезив.