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Forming the maxillary palatal relief on the outer palatal surface of the complete removable dentures.

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Abstract.

Prosthodontic treatment of secondary complete adentia in the upper jaw with completely removable plate prothesis consists in reflecting the palatal relief on the outer surface of the upper jaw prosthesis basis. Preparation of CRPP for SCA is an arrangement of known clinical and laboratory stages.

During the prosthodontic treatment of SCA with maxillary CRPP, the following sequence was performed at the clinical and laboratory stages for the purpose of reflection of the palatal relief on the outer side of the maxillary prosthetic bases, the 2nd and 4th laboratory stages have been improved. So that:

Replacing the wax with plastic in the composition of complete removable dentures. *4,5,6,7,8 figures* of our work refer to this stage. At this stage: *Figure 8*-reflection of the relief of a part of the hard palate in the base plate wax added to the trial denture of a maxillary complete removable platen prosthesis. *Figure 9*-reflection of the relief of a part of the hard palate in the denture wax added to the trial denture of a maxillary complete removable platen prosthesis.

The present study shows that the complete removable upper plate prosthesis (CRPP) is more functional in the prosthetic treatment of secondary complete adentia (SCA). By using CRPP on the upper jaw, unnatural disturbances in the relief of the palatine region are eliminated. It will be useful for improving other clinical and laboratory stages of preparation of maxillary CRPP.

Keywords: *Secondary complete adentia (SCA), complete removable upper plate prosthesis (CRPP), orthopedic treatment*

Introduction.

Secondary complete adentia (SCA) is the absence of any teeth in the oral cavity. It occurs mainly as a result of caries and its complications (Al Quran F, Clifford T, Cooper C, Lamey PJ. 2001: pages 35-40) During SCA, a person undergoes functional, aesthetic and psychological changes. As a result of functional changes resorption process takes place in the hard (bone) tissues of the

upper and lower jaw. And in the soft tissues covering hard tissues (mucous membrane, muscle), atrophy occurs. Resorption in the upper and lower jaw results in shrinkage of bone, particularly in alveolar ridge height. Because of atrophy soft issues become thinner, muscle loses tone and their strength decreases (Aida J., Kondo K., Hirai H., Nakade M., Yamamoto T., Hanibuchi T.,Osaka K., Sheiham A., Tsakos G., Watt R.G. 2012;60(2):338-343)

The main prosthodontic treatment for secondary complete adentia is the development of complete removable plate prostheses (CRPP). CRPP-consists of an acrylic prosthesis base covering of the prosthesis area and artificial teeth attached to the base. Preparation of CRPP for SCA is an arrangement of known clinical and laboratory stages. Each clinical stage is followed by a laboratory stage (Bayramov, Y. I. (2019)

So that:

Clinical stage: 1. Anamnesis. Examination of the oral cavity. Removing an anatomical impression with a standard metal spoon and any impression mass, but with careful design of the edges of the impression**.**

Technical stage: 1. casting of the model according to the anatomical impression; delineation of borders on the model and making of acrylic individual spoon on the model.

Clinical stage: 2. Introduction of the individual spoon into the oral cavity, removal of a functionally suction cast. The cast, together with the spoon, is passed on to the technique.

Technical stage: 2. Casting a model according to a functionally suction cast, making a primus roller to determine central occlusion.

Clinical stage: 3. Determination of central occlusion:

- final determination of the central ratio of the jaws with simultaneous fixation of the central occlusion
- Selection of the appropriate color and form of the artificial teeth

Technical stage: 3. Casting the model into the articulator, setting artificial teeth.

Clinical stage: 4. Checking the design of a complete removable prosthesis on the model and in the oral cavity:

Technical stage: 4. Replacing the wax composition of complete removable dentures with plastic.

Clinical stage: 5. Delivery of the prosthesis.

Thus, during SCA CRPPs made for the upper and lower jaws should replace the resorbed bone tissue and atrophied soft tissue along with the lost teeth. The acrylic base of the CRPP prepared for the upper and lower jaws should reflect the prosthetic relief, and the artificial teeth should reflect the dental arch. The lost functional and aesthetic change should be restored by the preparation of CRPP .

However, when CRPP is prepared for the maxilla, the prosthesis relief remains on the inner side of the prosthesis bases. The outer side of the prosthesis bases is smooth and polished.

Therefore, in order to establish the optimal individual clinical condition for both the prosthetic base and the artificial dental arch, scientific studies were carried out at different times and different opinions were expressed.

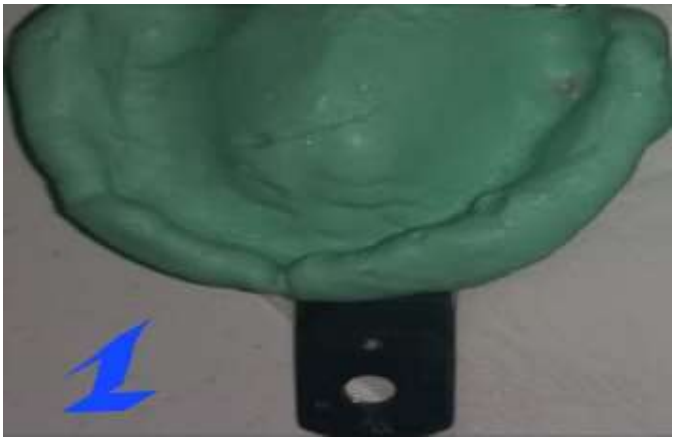
Despite the improvement of materials and methods to achieve the goals of prosthodontic treatment with CRPP during SCA, a number of issues continue to be actual problem for orthopedic dentistry.

Thus, this problem remains relevant as it has not yet been solved. İt is needed to optimize the reflection of the bases on the palatinal part of the complete removable maxillary plate prosthesis on the outer surface of the prosthesis bases.

Subjects and methods

Preparation of CRPP for SCA is an arrangement of known clinical and laboratory stages.
During the prosthodontic treatment of SCA with maxillary CRPP, the following sequence was performed at the clinical and laboratory stages for the purpose of reflection of the palatal relief on the outer side of the maxillary prosthetic bases, the 2nd and 4th laboratory stages have been improved. So that:

Clinical stage: 1. Anamnesis. Examination of the oral cavity. Removing an anatomical impression with a standard metal spoon and any impression mass, but with careful design of the edges of the impression **(*Figure 1*).**



(*Figure 1*).

Technical stage: 1. casting of the model according to the anatomical impression; delineation of borders on the model and making of acrylic individual spoon on the model.

Clinical stage: 2. Introduction of the individual spoon into the oral cavity, removal of a functionally suction cast. The cast, together with the spoon, is passed on to the technique.

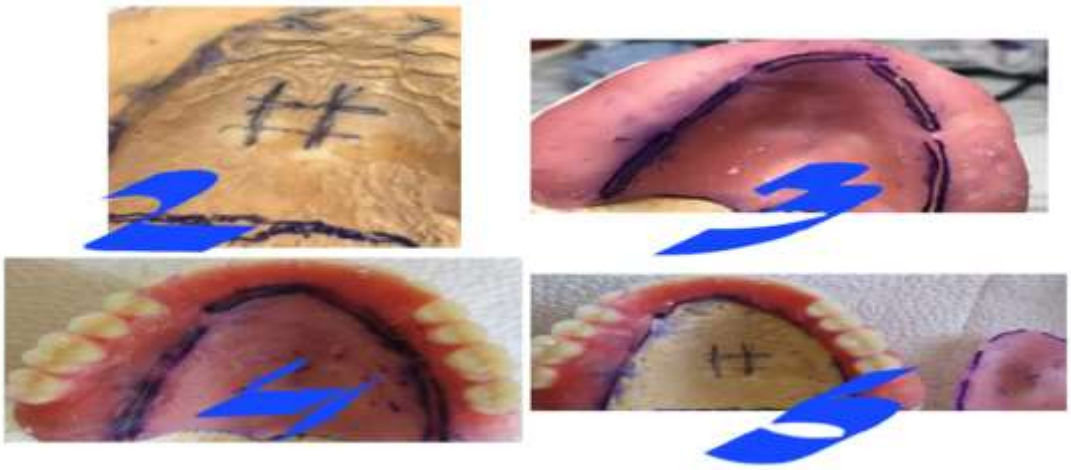


Figure 2

Technical stage: 2. Casting a model according to a functionally suction cast **(*Figure 2*),** making a primus roller to determine central occlusion.

At this stage of our work incision is made to the hard palate of the acrylic bases ***(Figure 3).***

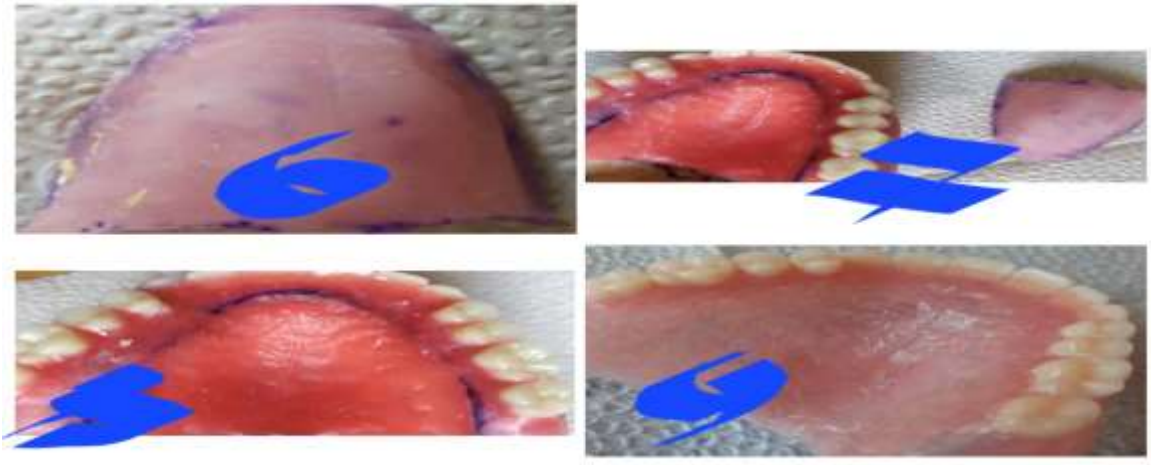
Clinical stage: 3. Determination of central occlusion:

- final determination of the central ratio of the jaws with simultaneous fixation of the central occlusion
- Selection of the appropriate color and form of the artificial teeth

Technical stage: 3. Casting the model into the articulator, setting artificial teeth.

Clinical stage: 4. Checking the design of a complete removable prosthesis on the model and in the oral cavity:

Technical stage: 4. Replacing the wax with plastic in the composition of complete removable dentures. 4,5,6,7,8 figures of our work refer to this stage.



At this stage:

Figure 4-trial denture of a maxillary complete removable plate prosthesis

Figure 5-removal of a part of the hard palate of the acrylic bases in the trial denture of a maxillary complete removable plate prosthesis.

Figure 6- part of the hard palate of the acrylic base used as a stamp in the trial denture of a maxillary complete removable plate prosthesis.

Figure 7- adding base plate wax to a part of the hard palate taken from the acrylic base in the trial denture of a maxillary complete removable plate prosthesis, stamped with figure 6 in case of its softening.

Figure 8-reflection of the relief of a part of the hard palate in the base plate wax added to the trial denture of a maxillary complete removable platen prosthesis.

Clinical stage: 5. Delivery of the prosthesis.

Figure 9-reflection of the relief of a part of the hard palate in the denture wax added to the trial denture of a maxillary complete removable platen prosthesis.

Results

During the prosthodontic treatment of SCA with maxillary CRPP, to reflect the relief of the palatine region on the outer surface of the base of the maxillary prosthesis, the laboratory stage has been improved in the clinical and laboratory stage of prosthesis preparation.

So that, during SCA, partial incisions are made on a hard acrylic base in accordance with the border of the palatinal part after 1st, 2nd clinical stages and 1st laboratory stage are performed by the traditional method according to the clinical-laboratory stages of the preparation of CRPP.

Afterwards, the 3rd, 4th clinical stages and the 3rd laboratory stage are performed by the traditional method. Laboratory stage 4 consists in replacing the trial denture with permanent acrylic-based structure in the CRPP to be prepared.

Figure 5-removal of a part of the hard palate of the acrylic base in the trial denture of a maxillary complete removable plate prosthesis. In this case, after the palatinal part is separated from the acrylic base, that area on the model remains hollow. Palatinal relief is reflected on the inner surface of the acrylic part removed from that area.

Figure 6- part of the hard palate of the acrylic base used as a stamp in the trial denture of a maxillary complete removable plate prosthesis. This acrylic part was used to reflect the relief to the outer surface of the palatinal part of the CRPP to be made.

Figure 7- adding base plate wax to the part of the hard palate taken from the acrylic base in the trial denture of a maxillary complete removable plate prosthesis, stamped with figure 6 in case of its softening. In this case, the base of the CRPP consists of the base wax in the palatinal part. As the wax adheres to the plaster model, the relief of the palatal region is reflected on its inner surface. The inner surface of the acrylic part removed from the palatinal part also reflects the palatinal relief. After the acrylic part from the palatal area is cut and removed, and filled with base wax as needed. When the filled wax is soft, the acrylic part removed from the palatal part is compressed and used as a stamp. After the cooled wax has hardened, the acrylic part used as a stamp is removed from there.

Figure 8-reflection of the relief of a part of the hard palate in the base plate wax added to the trial denture of a maxillary complete removable platen prosthesis. After that, the wax construction of the prosthesis is replaced with an acrylic base.

Discussion

In the maxillofacial region SCA causes dysfunction of the stomatognathic system, which is formed by muscles, bones, nerves, circulatory and lymphatic systems, teeth and other soft tissues. (Bayramov, Achundov, 2019; 80(12):23-26)

Depending on various etiological and geographical factors, SCA occurs on average after 45 years of age. Irreversible changes occur in the stomatognathic system depending on formation period of SCA. Due to the formation of "progenia" aesthetic changes arise on the face. The "progenia" occurs due to the fact that after the loss of teeth on the vestibular side of the alveolar ridge in the upper jaw and on the oral side of the lower jaw, there is more resorption and atrophy. Therefore, it seems that the size of the upper jaw is shrinking and the size of the lower jaw is growing, creating a "progenia" (Bayramov, Achundov, 2019; 80(12):23-26)

After the loss of teeth, resorption in hard tissues proceeds, and the volume of the bone decreases. In soft tissues, the atrophy process leads to its thinning. In this regard, the vital chewing and speech functions are impaired. Absence of teeth and violation of the mentioned functions lead to psychological discomfort and deterioration in the quality of life.

Prosthodontic treatment with CRPP is one of the most important procedures in dentistry. Because if the patient does not have any teeth in the oral cavity, in order to prepare CRPP, the orthodontist determines the features of prosthodontic treatment depending on the anatomical, physiological, pathological and hygienic state of the patient's oral-maxillofacial system and tries to achieve the goal, adjusting it with performance indicators.

By the words of Guichet (1970), “Dentistry is a science and an art that aims to protect and restore the stomatognathic system by providing the aesthetic, phonetic and functional needs of the patient and maintaining his tolerance to diseases” (Çalıkkocaoğlu, S. (2012))

Mouton (1726) calls this person, engaged in science and art, “an oral architect” who should pay special attention to the decorative properties, comfort and health of the artificial teeth he made” (Efeoglu 1992) (Çalıkkocaoğlu, S. (2012))

Trappozano (1961) calls complete prostheses “artificial structures in which not only all teeth are covered, but also other common tissues in the jaw arch along with the teeth” (Çalıkkocaoğlu, S. (2012))

Therefore, in case of SCA, prosthodontic treatment is restorative treatment method, its implementation should weaken the resorption and atrophic processes, and thus a functional and cosmetic effect is achieved.

Over time, each prosthodontist is forced to respond to the complaints related to prostheses after CRPP is delivered to the use of patient. Despite the use of CRPP various complaints are expressed by the patients at different ages, depending on duration of SCA. The most important of these is the decrease in taste ability as the prosthesis is used. According to the results of the research mentioned in various literature, it is related to physiological aging of the patient and acquired systemic diseases.

It is known that in the human body, like all organs and systems, the stomatognathic system has the appropriate anthropometric dimensions. In addition, the tongue, as a muscular organ, its upper surface touches the palatal surface of the upper jaw throughout a person's life and adapts to its relief. Therefore, the outer surface of the maxillary CRPP, which is involved in the performance of relevant functions, should also reflect the relief of the palatal area.

However, when CRPP is prepared in the traditional way, the negative of the prosthetic area remains on the inside surface of the prosthetic base. Its outer surface, especially the palatine, is smooth, practically without reflection of any individual relief.

It is especially important that the palatal part of the upper jaw is reflected both on the inner surface and on its outer surface of the prosthetic base. Because when any function is performed, the language relies on that area. Also, the folds located in the anterior palatine cause cleaning and irritation of the taste buds on the tongue. This, in turn, inhibits the atrophy of the papillae on the tongue.

In dentistry, prostheses are devices designed to maintain lost and altered teeth and tissues, chewing functions, speech abilities and aesthetic appearance, as well as the integrity of the tissues of the prosthetic area. During SCA, CRPP is prepared mainly for 5 purposes (Critchlow S.B. 2010:2-9):

1. Functional purpose (maintain the patient’s ability to eat and thus be able to be nourished)-the preparation of the CRPP helps the patient to be able to chew food and thus to eat properl***y***. In generally, the ingestion of food, when it is not chewed well, causes digestive problems and it also requires a tooth to be able to chew.

Although people who have been edentulous for many years and have not worn dentures seem to perform this function with edentulous alveolar arches. However, in this situation it is important to accept the increase in the frequency of some pathological changes in the stomatognathic system.

In human life, there is literally a paradox in whether food is perceived as chewed or not. Because there are also sources that deny the need to perceive foods that need to be chewed constantly for health. Studies have shown that more than half of foods such as beef, sausage, chicken, potatoes, peas and carrots can be digested without chewing at all.

In this case, it is important to prepare CRPP for patients in terms of general health care. But still, it's important to intake a variety of nutrients, and for that, you need teeth and good chewing.

During SCA, patients cannot chew as comfortably and powerfully with their own teeth as young people, as their muscular system is weakened and, in particular, they use structures called CRPP that do not resemble natural human teeth. For these reasons, they have to intake soft food.

During SCA, improper nutrition of patients for various reasons and a number of problems caused by age can put the doctor in a difficult position despite the absence of any failure in the laboratory stages of the preparation of the prosthesis.

2. Cosmetic purpose (preserving the aesthetic appearance of the patient)- Aesthetic appearance has been very important issue throughout history, as well as in the modern era. During the preparation of CRPP waiting for the healing of wounds for months after tooth extraction is not accepted by active working people, even elderly people who have moved away from active working life during retirement

Seeing toothless people in such a situation by others and when they look in the mirror will cause an internal shake-up. For these reasons, the second major purpose of CRPP is restoration of aesthetic appearance.

3. Phonetic goal (Keeping the patient's speech clear and understandable)- Teeth are articulatory organs in the mechanism of sound creation. Anatomical and functional changes in the orofacial-maxillary region due to tooth loss cause a sharp change in the ratio between active and passive organs of the speech system.

The absence of teeth in the oral cavity leads to the fact that sounds are not produced normally, and therefore speech is not understood. Therefore, the preparation of the CRPP is one of the purposes set to overcome this problem. Although using defectively prepared CRPP cause speech disorders and poor conversation. When using CRPP for the first time, some sounds may not be pronounced correctly till you adapt to it.

However, it should not be forgotten that, in general, well-prepared CRPP should preserve the correct and intelligible speech of the patient.

4. Psychological purpose (eliminating the psychological problems caused by tooth lessness)-This purpose is closely related to the patient's desired aesthetic appearance. The complete absence of teeth directly affects the patient's quality of life.

A person without teeth is one of the risk factors that will cause psychological trauma if he is in society and has close contact with people. This case is an impact that can put people in complexes.

With the correction of the teeth, the patient's self-confidence increases, and the patient becomes psychologically healthy.

5. Biological purpose (protection of the integrity and continuity of tissues)- within the physiological parameters, CRPP require special skills from the doctor as devices that should replace not only lost teeth, but also atrophied tissues in the area of the prosthesis. Although it is not clearly visible and does not particularly attract attention at first glance, one of the most important purposes of prosthesis preparation is to preserve the continuity of tissues.

Both soft (mucosa) and hard-bony tissues in the oral cavity need to receive functional pressure in order to be healthy and maintain their continuity. Pressure should be intermittent and short-term. In such cases, blood circulation is stimulated, and new bone formation activity is also stimulated in the bone tissue.

For these reasons, one of the purposes, and perhaps the most important, of preparation of prosthetist is to preserve the durability and completeness of tissues.

Therefore, during the SCA, prepared CRPP should replace not only lost teeth, but also other tissues. Like other tissues, after tooth loss, the alveolar ridge is resorbed and reduced, and the soft tissues covering it must change accordingly to the alveolus. Therefore, artificial teeth on CRPP should be a device that replaces the dentition, and the acrylic base should replace resorbed hard and atrophied soft tissues.

In this study, the upper jaw palatinal Area Relief negative of the patient was reflected in the outer palatinal (figure) part of the CRPP made to the upper jaw. It is particularly important that the relief of the palatal part is reflected on both the inner and outer surfaces of the denture base. Thus, the reflection on the inner surface of the prosthesis ensures its good fit to the prosthetic site and its fixation. Reflection on the outer surface of the prosthesis does not create additional obstacles to the movements of the tongue when the patient performs various functions (feeding, speech), the movement and positioning of the tongue is free. As a result of this, during feeding, the tongue does not move the prosthesis, putting additional pressure on it. Causes clear pronunciation during speech. Also, the tongue papillaes rest freely against the outer palatal surface of the prosthesis. The folds of the palatal area reflected on the outer surface of the prosthesis clean the taste buds on the tongue, irritate them and inhibit their atrophy. Therefore, the sense of taste persists longer in patients using a prosthesis made by this method than in those who use a prosthesis made in the traditional way.

Conclusions.

The present study shows that the complete removable upper plate prosthesis (CRPP) is more functional in the prosthetic treatment of secondary complete adentia (SCA). By using CRPP on the upper jaw, unnatural disturbances in the relief of the palatine region are eliminated. It will be useful for improving other clinical and laboratory stages of preparation of maxillary CRPP.

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