



**PROSTHETICS WITH TELESCOPIC CROWNS IN PATIENTS
WITH ADENTIA**

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ABSTRACT

A method of prosthetics with partially removable prostheses fixed with a telescopic or double crown is described. The design and functional features of the crown are described. Indications and contraindications to the use of this type of prosthetics are presented. The nuances of its manufacture are discussed. The historical stages of the use of double crowns are described. Recommendations on the use of telescopic fixation systems are also given.

KEYWORDS

removable prosthesis,
telescopic crown,
holography, mathematical
modeling, fixation.

Introduction

In case of partial absence of teeth, various prosthesis designs are used. Both removable and non-removable prostheses are used. Bridges are called physiological prostheses. Removable dentures, unfortunately, do not have these advantages, but this does not mean that they are less in demand. When choosing the design of a removable partial prosthesis, doctors first of all face the question of how to strengthen the prosthesis in the oral cavity, how to fix and stabilize it correctly and effectively. An effective method of fastening is one of the conditions that guarantee good functionality of the prosthesis. This is a criterion for the successful use of removable prostheses [1, 2]. Fixation of removable prostheses with partial secondary defects is carried out using various artificial mechanical systems, while adhesion and anatomical retention are taken into account [7]. The use of adhesion, taking into account the anatomical features of the prosthesis base, does not solve all the problems associated with fixation, since the adhesive strength is very low with small sizes of the prosthesis base, and anatomical conditions may be unfavorable. However, the latter cannot be ignored, as they are of great help in creating systems for fixing prostheses. Mechanical devices play an important role in the fixation and stability of removable partial prostheses. This article discusses removable prostheses of the type fixed with telescopic crowns. The structure of the crown, its functional characteristics, indications for use, positive and negative aspects of the use of such crowns are presented in detail, the features of their manufacture are explained [3]. As you know, a telescopic crown is a system consisting of two crowns. The inner crown is fixed on the tooth. The outer crown is made by restoring the shape of the tooth crown. It is attached to the inner crown due to static friction. The external telescope is part of a removable prosthesis. It serves as a retention element that holds the removable prosthesis in the oral cavity. Retention of the prosthesis occurs due to static friction at rest and with various

movements of the lower jaw [5, 9]. Telescopic retention systems have their advantages and disadvantages. The main advantage is that the transfer of the chewing load occurs along the axis of the tooth. This has a positive effect both on the teeth and on the adjacent tissues. From the point of view of physiology, this is normal and correct. If the periodontal ligament is not weakened, then such a system is rigid and positive. Another advantage is that when removing one of the abutment teeth, it is not necessary to completely alter the prosthesis (it is only necessary to repair the existing one). With a sufficient number of abutment teeth (four or more), it is also possible to avoid creating the basis of a prosthesis that overlaps the mucous membrane. In a word, this prosthesis combines the advantages of both removable and bridge prostheses. The disadvantage is the rigidity of the system mentioned earlier. It is contraindicated with a weakened periodontal ligament. Two crowns are used in telescopic systems, but there is not always enough space for the manufacture of such a design. The possibility of using a telescopic system is determined by the doctor and the patient, taking into account the positive and negative aspects that must be taken into account during prosthetics [3]. Fixation of the prosthesis on a double crown in the oral cavity is carried out using cylindrical rods. When making removable dentures on a double crown with metal cylindrical rods, it is necessary to observe the following rules for preparing abutment teeth, water and air cooling of the working area is a prerequisite. When preparing a responsible tooth, infiltration or conduction anesthesia should be used. The teeth of the abutment are formed in the traditional way using diamond bores. Teeth are formed without a ledge. The tooth cavity should be formed in such a way that the angle of the side wall is within $100-110^\circ$ to the longitudinal axis of the tooth. From the contact, vestibular and oral (or palatine) surfaces, shave off at least 1.0-1.5 mm of hard tissue. From the occlusal surface - 1.5-2 mm; the sharp edges of the teeth should be smoothed. The surface should be treated with fine-grained versier. The two-layer silicone impression is removed according to the generally accepted method. In the dental laboratory, a dental technician makes a collapsible model in plaster. Then the cone of the side wall and the ledge turn into a parallelogram. The crown, reproduced in wax, is translated into metal in the usual way. The resulting cast metal crown (primary telescope) is implanted into the oral cavity. After implantation of the primary double crown, a double silicone impression is removed for the manufacture of a secondary crown. The primary crown is also sent to the dental laboratory. In the dental laboratory, a collapsible model is made of superplastic, on which the primary crown is fixed. After modeling the secondary crown in wax, a blank is added to it to fix it on the basis of a removable prosthesis. In general, the secondary crown reproduced in wax is converted into metal. After grinding and polishing the secondary crown, a round hole with a diameter corresponding to a metal cylindrical rod is cut out in its distal surface. A recess corresponding to the hole in the secondary crown is made in the primary crown. The generally accepted method consists in making a removable prosthesis and welding a metal cylindrical rod to a base made of soft plastic. The rod should pass through the hole in the outer crown and protrude slightly inwards to match the recess in the inner crown. The resulting removable prosthesis is fixed intraorally on the supporting teeth. Fixation occurs due to the fact that the rounded end of the cylindrical metal rod enters the recess of the inner crown, as well as due to the elastic properties of the soft plastic in which the rod is located [4, 6]. A brief overview of the history of prosthetics using a telescopic system should be made. The first telescopic clamps had cylindrical walls, molded occlusal surfaces and were manufactured by stamping or soldering. Lined telescopic crowns appear. Composites are used to cover a dental prosthesis with a telescopic fixation system (there is a generally accepted rule: a non-removable denture can be lined with ceramics, but a

removable prosthesis must be lined with plastic). We started manufacturing telescopic crowns from base alloys, with a free fit, the fixation of which was carried out with the help of additional elements (crossbars, ball springs, etc.). Then we moved on to the manufacture of double crowns from base alloys, which is a relatively inexpensive method of prosthetics. Fixation of prostheses on double crowns made of base alloy is an alternative to clamp prostheses, prostheses with fixation on attachments, as well as prostheses with fixation on telescopes made of noble alloy. Previously, they tried to make double crowns from a base alloy based on the technology of manufacturing telescopes from alloys with a high gold content. Unsatisfactory results (poor packing, short duration of fixation) dictated the need to manufacture additional fixing elements. With the current level of development of science and technological processes, the manufacture of double crowns is possible without auxiliary elements, although this process is considered a highly demanding and time-consuming work. Axial loads on the prosthesis, which replaces the extended defects of the dentition on the lateral sections of the lower jaw and fixation on the extreme molars and teeth of the incisor row, generates a deformational situation depending on the point of its localization. When loaded in the area of the supporting molar, the alveolar bone tissue in its periodontal zone is intensively deformed, which represents When loaded on the middle of the prosthesis due to its deflection on the supports, counter-wrenching forces occur, causing an extended deflection of the jaw between the supports, as well as its general skew relative to the opposite branch. The effect of the prosthesis deflection significantly affects the deformation of the frontal support segment of the jaw. Alternating forces occur on the teeth of the incisor row: pressing – from the side of the load and pulling – from the opposite side. As a result, the misalignment of the jaw also becomes alternating. As for the vertical load on the supports, it becomes more gentle due to the proportional redistribution between them. With frontal loading, the deformation of the jaw is identical or close to its natural state: there is a symmetrical rotation relative to the virtual axis localized in the zone between the articular processes with the imposition of a local inflection of the frontal segment on it. With a lateral load, With a lateral load on the intermediate segment of the prosthesis, the supports are subjected to a wrenching force directed into the jaw in proportion to its size, which is especially dangerous for the extreme supporting tooth.

Conclusion:

Thus, considering that in a real situation all the considered load options are equally probable and unpredictable, from a clinical point of view, this method of prosthetics should be considered as inevitable. Prosthetics with an additional (in addition to teeth) support on the prosthetic bed allows you to practically remove the axial load on the supporting teeth when it is localized in the middle of the prosthesis above the defect of the dentition. Edge loads are still potentially dangerous. It is necessary to distinguish the concepts of a telescopic crown. Previously, they were synonymous, today double crowns are called, made of base alloys, respectively, telescopic crowns are called, made of gold-containing alloys. The considered method of prosthetics with removable dentures with telescopic or double fixation allows solving certain prosthetics tasks and is recommended for use by orthopedic dentists in everyday practice. Further research concerns the construction of a mathematical model of a telescopic system, which will become material for future articles. For mathematical modeling of the stress-strain state of cone-shaped telescopic crowns, two subdomains in the field of modeling corresponding to parts of cone-shaped telescopic crowns are identified.

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