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TOOTH PREPARATION AS A CRUCIAL STAGE HIGH-QUALITY MANUFACTURING OF THE TAB

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Abstract
Significantly large cavities in permanent teeth can be filled with tabs. The formation of hard tissues in such cases has its own characteristics; NTI produces special diamond-coated bores that allow you to model the optimal geometry of the cavity for the manufacture of the tab.

Keywords: Inlay, cavity formation, diamond burs, dental materials.

Introduction

At the present stage of dental development, the field of microprosthetics is becoming increasingly popular and attractive not only for orthopedic surgeons, but also for therapeutic dentists. This concept also applies to designs such as tabs. Microprostheses restore the anatomical shape of the teeth and guarantee chewing and, if necessary, aesthetic function. Indications for the manufacture of inlays are the presence of significant carious and non-carious crown defects (trauma, wedge-shaped defects, pathological obliteration).

Methods and Materials:

Tabs are used as supports for non-removable prostheses in case of inefficiency of fillings (seal loss) or in the presence of a defect in the angle or incisive edge of the crown. Tabs can be made of metal, plastic or porcelain, depending on the material they are made of. Light-curing composite materials are used in therapeutic dentistry clinics. The initial stage of the work consists in the mechanical cleaning of teeth from plaque and, for aesthetic purposes, in determining the shade of color. The cleanliness and dryness of the work area is ensured with the help of a cofferdam. The next stage is the preparation of teeth, on which the quality of fixation of the tab depends. From the point of view of the mechanism of fixation of the microprosthesis, the cavities should have smooth walls, a flat bottom and be located at right angles to each other. However, such an "ideal" shape makes subsequent work difficult. It is not always possible to remove the wax matrix from the cavity without deforming it, especially for

photopolymerized bases of tabs. In accordance with these provisions, it is recommended that the inlet to the cavity be slightly wider than the base of the cavity. In this case, the angle of inclination of the wall with respect to the base is 4-6°, which facilitates the extraction of both wax reproductions and composite inlays from the cavity. Dental preparation is carried out with diamond and carbide borons in accordance with the instructions for use. The high quality of the diamond coating of the instrument guarantees a long service life, a wide range of sterilization methods and optimal preparation of hard tissues. Therefore, various technologies have been developed for the production of diamond tools. For example, New Technology Instruments (Germany) uses the method of applying a single layer of diamonds with evenly spaced diamond grains, which increases cutting capacity, reduces heat generation, prolongs the service life of the tool and prevents the penetration of metal particles from the boron base into the enamel. It can also be used to prevent the penetration of metal particles from the boron base into the enamel. International standards (ISO) set standards for the size and working area of the tool, the abrasiveness of the diamond coating and the compatibility of the diameter of the boron shank with the inlet of the tip. Several types of diamond tools are available, depending on the size of the diamond abrasive. Color marking is carried out in accordance with international standards. Natural or synthetic diamonds can be used to cover the treated parts of boron. Natural diamonds are split, fragments or grains are sifted and sorted by size. Synthetic diamond grains are made from carbon in the synthesis process at high pressure and high temperature. After synthesis, the grains are cleaned and sorted. The optimal geometry of the workpiece and high precision of the drill alignment are achieved by uniform electrodeposition of diamond grains of the same diameter into a hardened steel base. The larger the grain size of a diamond tool, the faster the tooth structure is formed and the greater the surface roughness (SC, C, M - grains of natural diamonds). The smaller the grain size, the smaller the depth of micro-roughness (F, SF, UF - synthetic diamonds). Depending on the size of the diamond grain, bores are used for different purposes: SC - high-speed, C - high-speed, M - for universal tooth surface treatment, F - for polishing enamel edges, SF - for processing composite fillings and veneers, UF - for polishing structures. The main types of bores according to ISO standard: spherical bores, elongated spherical (surgical), reverse cone, double cone, occlusive, bores for removing amalgam, wheel-shaped, pear-shaped, depth marker, lenticular, elongated pear-shaped, cylindrical with a flat tip, cylindrical with a round tip, for tissue protection (stepped), cone with flat tip, cone with rounded tip, rounded tip, rounded conical, spruce, needle-shaped, candle-shaped, pointed cylindrical, oval, interdental, occlusal contour, mosquito bite,

rounded wheel, rough (reduser). Each drill is available with 8-12 different working part sizes and 4 different shank sizes for use with straight, angular and turbine tips. The formation of the inlay cavity begins with a cylindrical boron to open the cavity, followed by a spherical carbide boron for dentin necrosis. The final formation of the orbital cavity is carried out using a special In Prep diamond head (NTI) with two different sizes (019 and 025) and two different diamond grains (C-FG and F-FG). It is characterized by a reasonable taper of 6°, which gives the walls of the cavity the necessary inclination relative to the bottom of the cavity (Fig. 2). The boron is intended for use on turbine tips where water cooling is necessary (Fig. 3). Pretreatment begins with the use of a coarse-grained abrasive tool (Fig. 4). Finishing is carried out with a thinner diamond-abrasive bar, the so-called surface treatment (Fig. 5). The next feature of the sinus formation is the absence of symmetrical elements. Round, square, or diamond-shaped contours are not created. Symmetrical walls can lead to incorrect installation of the tab. Giving uneven contours ensures optimal installation of the microprosthesis. If there are carious cavities on the adjacent surfaces of the teeth, they are combined into one. In the process of forming the walls of the cavity, it is necessary to take into account the structure of hard tissues, the thickness of various sections of the tooth, the topography of the pulp chamber, age-related changes and individual characteristics. After the preparation is completed, the cavity is thoroughly rinsed with water and dried with low-fat air (Fig. 6). In the treatment room, the dentist applies a wax duplicate. If the cavity is formed correctly and the angle of deflection of the walls is 4-6°, the wax matrix can be easily removed using a pin or hairpin. In the laboratory, the tab is made on a model, polished and transferred to a dental technician, who installs it on a fixing cement. The excess cement is removed, and finally the tab is polished with the NTI tool (Fig. 9). Special attention is paid to the border between the filling and the tooth. Their quality is monitored using digital cameras. The procedure for making a clinical tab First removes the existing filling and carious tissues. In the manufacture of a classic inlay, the edges of the enamel are not beveled, but slightly diverge (6°), and all internal corners are rounded. The cavity and the entire tooth are insulated with a special gel (vaseline) and dispersed by a light stream of air. The transparent matrix around the tooth is reinforced with wooden or light-conducting wedges and insulated with gel. Apply an opaque composite resin to the bottom and walls of the cavity and polymerize for 20 seconds. Apply the required enamel shade layer by layer to a thickness of no more than 2 mm and polymerize each layer. Remove excess material with a soft disk and remove the tab (using bond pins) from the cavity. Polymerize in a light oven (light box) for 4-6 minutes. Remove the insulating gel from the cavity and rinse with water.

Install a new matrix, fix it with wedges, etch the edges of the enamel for 60 seconds, rinse with a stream of water for 20 seconds and air dry. Apply adhesive bond to all internal surfaces of the cavity and irradiate for 40 seconds. Thoroughly clean the surface of the tab, rinse with water, dry with low-fat air and moisten with adhesive. Do not polymerize. Apply double-curing fixing cement to the walls of the tab. Insert the tab into the cavity with little pressure until the cement polymerizes. Then the surface is cleaned and excess cement is removed. Finishing and polishing is carried out using the NTI Diamond Gloss Set. The set contains six tools for pre-polishing, rough polishing and polishing to a natural shine. Diamond powder composite resin polishing tools can be used to polish surfaces with high polishing quality (Fig. 10). The interdental spaces are treated with strips. Teeth are covered with fluoride-containing varnish.

Conclusion

Aesthetic tabs have many advantages. For example, fixing the tab with a modern bonding system practically restores the original strength of the tooth. No additional retention points are required during preparation, since the structure is held in the cavity by bonding. Making an inlay outside the cavity guarantees better approximal and anatomical control. The properties of the material, manufacturing techniques and methods of fixing the inlay ensure an accurate fit of the structure to the walls of the tooth. The mechanical properties of the sealing material tightly adjacent to the enamel ensure high wear resistance without damaging the antagonist teeth. This guarantees resistance to chewing loads. Aesthetic materials mimic the natural transparency and color of enamel for optimal aesthetics.

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