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# EXPERIENCE OF AESTHETIC-FUNCTIONAL DENTAL RESTORATION BY PINING METHOD

## ДОСВІД ЕСТЕТИКО-ФУНКЦІОНАЛЬНОЇ РЕСТАВРАЦІЇ ЗУБІВ МЕТОДОМ ШТИФТУВАННЯ

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***Abstract.*** *The work draws attention to the modern aesthetic demands of society, which are supported by high-quality new technologies and allowed the formation of such a direction as aesthetic dentistry. The main task of aesthetic dentistry is the manufacture of restorations characterized by functional efficiency, biocompatibility and aesthetic perfection, taking into account all the individual physiological characteristics of the patient. The using of modern materials and technologies in the field of dental restorative therapy has significantly expanded the range of dental services provided. This study is devoted to the analysis of a number of such technologies, and especially to pinning. Various evaluative and summary results of elimination of infectious degradation and aesthetic-functional restoration of teeth by the pinning method and recommendations for further complex application of these methods in dental practice are presented.*

***Key words:*** *aesthetic dentistry, degradation of dental tissues, types of dental restoration.*

***Анотація.*** *В роботі звертається увага на сучасні естетичні запити суспільства, які підкріплені якісно новими технологіями і дозволили сформуватися такому напрямку, як естетична стоматологія. Основним завданням естетичної стоматології є виготовлення реставрацій, що характеризуються функціональною ефективністю, біосумісністю і естетичною досконалістю, з урахуванням всіх індивідуальних фізіологічних особливостей пацієнта. Використання сучасних матеріалів і технологій в області відновлювальної терапії зубів істотно розширило спектр надаваних стоматологічних послуг. Аналізу ряду таких технологій і особливо - штифтуванню присвячене дане дослідження. Наводяться різні оціночні і сумарні результати усунення інфекційної деградації і естетико-функціональної реставрації зубів методом штифтування і рекомендації подальшого комплексного застосування зазначених методів в стоматологічній практиці.*

***Ключові слова:*** *естетична стоматологія, деградація зубних тканин, види реставрації зубів.*

**Introduction.** With modern restoration of damaged tissues, methods of replantation of teeth and their roots, through root implantation, as well as pinning are used, which are aimed not only at preserving the periodontium, as one of the most

important components of the periodontium, but also at strengthening it. These technologies are becoming more available and applied [1, 2].

The **aim** of our study is learning the stages of dental pinning, varieties of finished structures depending on the material, shape and size, to identify the degree of effectiveness in application to the restoration of the crown part of the tooth, drawing attention to this topic.

**Materials and methods:** analysis of scientific literature, summary tables information based on the data obtained. Digital arrays are processed by methods of mathematical statistics using generally recognized programs (Word, Excel etc.) [1,4].

**Results and discussion.** Aesthetic dental restoration is a field of aesthetic dentistry that deals with the reproduction of a healthy tooth structure with the help of one or another artificial imitation (restoration design). It represents a complex of modern technologies and materials that are able not only to correct anatomical congenital anomalies, but also to restore individual characteristics previously lost due to infection or injury, age-related changes, insufficient hygienic care, natural shape and beautiful appearance of teeth [2, 3].

One of the most common restoration methods in dental practice is the restoration of a dental crown using a post. This abutment device is like a screw or a small, even small nail, which is embedded in the root canal and becomes an abutment instrument supporting the upper part of the crown. Pinning is used in the treatment of pulpitis and periodontitis, advanced carious lesions with destruction of more than 50% of the crown part of the tooth, fracture or chipping of the upper part of the tooth while preserving its root, as well as the creation of anchor points for fixing the future prosthesis. In this case, it is important to take into account the thickness of the root walls (it is recommended from 2 mm or more) and the possibility of removing the previous composite of the root canal filling by 2/3 of it's depth.

The installation of the support rod takes place in several stages: radiovisiography and tooth sanitation – the image allows you to study the size and characteristics of the root to select the appropriate design, then the pathological foci of infection of the hard and soft tooth tissues are removed; treatment and filling of the

root canal – the canals are cleaned with the removal of pulp – nerves, for filling the canals, gutta-percha pins from a sealer are usually used, after thorough filling of the canals, excess gutta-percha cones are cut off with a hot instrument and compacted; installation of a pin (one or more rods); filling or restoration by the method of layer-by-layer application of a photopolymer composite – each layer is illuminated with an ultraviolet lamp, the body of the tooth with its relief is formed [3].

These structures are divided into two categories: metallic and non-metallic. The former are made from complex alloys of palladium, brass, titanium and gold impurities. The second category includes ceramic, fiberglass and carbon fiber devices. In addition, there are elastic and inelastic, active and passive, monolithic and combined, cylindrical, conical, cylindrical-conical.

In modern dental practice, the most popular are anchor and fiberglass pins, which at this stage of the development of the dental industry are gaining high priority. The anchoring device is an indicator of durability and reliability, it is used in two forms (active and passive), which allows the doctor to use the type of fixation that is optimal for each specific clinical case. The active posts have a thread, due to which they are rather rigidly fixed in the root canal. They are used only if the walls of the tooth root are strong and thick. Otherwise, there is a risk of splitting or cracking in the thin walls of the channel when screwing in the support device. Passive anchor pins are secured with cements. They have a smooth base, they are placed at a sufficient depth in the root canal. The use of passive pins is especially popular in the manufacture of hip inlays – micro-prostheses, consisting of a combination of a pin and a dental crown base.

Fiberglass posts are common in aesthetic dentistry. Due to their transparency, they are most often used in the restoration of front teeth, they are biologically compatible with the hard tissues of the teeth, do not cause allergic reactions, and do not emit toxic substances. Due to the elasticity and high strength when pressure is applied to the tooth, in particular in the process of chewing food, the load is evenly distributed over the entire surface.

During our study, we surveyed 100 dentists of various specialties about the

frequency of use of anchor or fiberglass posts. It turned out that 64% of them prefer fiberglass structures because they are made of woven glass fibers arranged horizontally and immersed in a special factory method in an epoxy matrix. The ratio by weight of fiber to matrix varies in posts from different manufacturers. The optimal combination of fiberglass and matrix, which in its physical properties would be similar to the structure of a tooth and at the same time had the strength of a metal, is 75% fiberglass and 25% (up to 42%) composite. The flexural strength is 560 MPa. To break a fiberglass pin with a diameter of 1 mm, a force of 160 kg is required. Moreover, it turned out that 31% of dentists use phosphoric acid to treat the pins before fixation, 27% use ethyl alcohol, 19% use silane coatings, 13% use pre-silanized pins, 6% use hydrofluoric acid, 4% do not carry out pretreatment. Also, in some cases, treatment with adhesive systems of different generations is used: anhydrin, sodium hypochlorite and sandblasting. To fix the pins, the majority of respondents (40%) use dual-curing composite cements that require pre-etching, 26% use dual-curing self-etching cements, 16% use glass ionomer cements, 14% use flowable composites, 4% use chemically cured composite cements. Thus, taking into account the wide demand for pins in everyday dental practice, the methods of their fixation and preparation for fixation differ significantly.

Despite the apparent advantages of the method of installing pin structures, earlier, over time, some certain alloys, when oxidized, gave an unpleasant taste and sometimes odor from the mouth, otherwise they became covered with recurrent caries or destroyed the walls of root canals. Now, in an improved form, the alloys from which the support pins are cast are resistant to the aggressive acid-base environment of the oral cavity; the methods of installing the supporting pins have been optimized, flexible structures have appeared, which give a huge advantage in terms of durability of the restored crown part of the tooth; aesthetic features allow to match the shades of composite fillings, creating an imitation of natural tooth enamel. Based on this, the use of this method minimizes the list of indications for tooth extraction and the likelihood of complications in the form of iatrogenic infection, as well as the subsequent complete destruction of the remaining periodontal tissues [2, 3].

**Conclusion.** On the basis of foregoing, it can be concluded that specific infectious dental lesions and aesthetic defects are subject to correction and treatment. The use of post structures requires the use of high quality dual-cure cements or modified composites. For aesthetic reasons, it is advisable to install composites on fiberglass posts as a support for crowns in the anterior region. It is recommended to model the base of the destroyed tooth crown in the form of a ledge in the part at the gingiva to improve the impact site, prevent possible root fracture and reduce the risk of de-cementing and cervical caries of the tooth root. Patients with installed support structures must undergo medical examination twice a year, taking into account the prevention of the possibility of caries development under the post restoration. To prevent complications, it is necessary to pay close attention to the observance of the rules of hygienic care for the restored crown part of the tooth and the oral cavity as a whole.

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