

PROBLEMS OF PRODUCING TEST SAMPLES FROM CALLUS DENTAL

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Abstract: *Human Teeth under the influence of food constant attacks by bacteria, which cause degradation of the enamel, and thus the formation of cavities. Dentists thanks to modern methods can remove the defect and fill the resulting hole with a composite, by gluing the two surfaces. The article presents three ways to append to the tooth composite and zircon crowns. It also presents problems in obtaining samples of a particular size due multilayer glue connections and anatomical structure of the tooth. The solution to this problem is to define sets of each group of materials comprising the laminated multi-layer connection.*

Keywords: *dentin, zirconium, composite, bonding, samples,*

1. Introduction

The main problem of today's bonded connections tooth - filler (composite), tooth - zircon is limited vivo stability. During clinical trials, it appears that the efficacy of the combination of the two surfaces is very low, although usually the manufacturer confirms the very high adhesion strength. The basic mechanism of complement fixation or zirconium is the process of turning minerals from the hard tissue of the resin monomers, which are micro - mechanically locked in the created porous surfaces. Based on this system of dental fillings and crowns assembling, we can distinguish two systems, the mechanisms of adhesion:

- a) **etch and rinse** – tooth bonds operate in three steps way: preparation step, etching the surface and then applying foundation, so that we could attach the bond to a porous surface, and the last stage which is putting the bond which binds the extender with tooth blade.
- b) **self – etch adhesive** – the most promising binding system, which dentist applies just in two steps. The base is also the etching surface. The treatment reduces the possibility of error and reduces the time of doing the treatment.

The primary function of the assumed composite fillings and crowns are:

- **replacement** - hard tissue replenishment and chewing surfaces that have been damaged or broken,
- **protection** - protect the health of the tooth from the bad effects of external factors and disease (eg. caries),
- **empowerment** (Supporting) - are used as support for partial dentures and bridges,
- **aesthetic** (cosmetic) - give the correct shape of the teeth, cover discolorations.

Aim of this study is to present the configuration of materials for fitting crowns and fillings with natural tooth.

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2. Preferred set of samples to analyze the strength of teeth filled and reconstructed

Review of literature shows that each type of clinical research is conducted on specially selected healthy molars. The dental practice is a very small percentage, when the dentist for healthy teeth will build a crown or bridge. Mostly there are treatments that take place on the teeth of dead in endodontic (root canal treatment) Fig. 1.

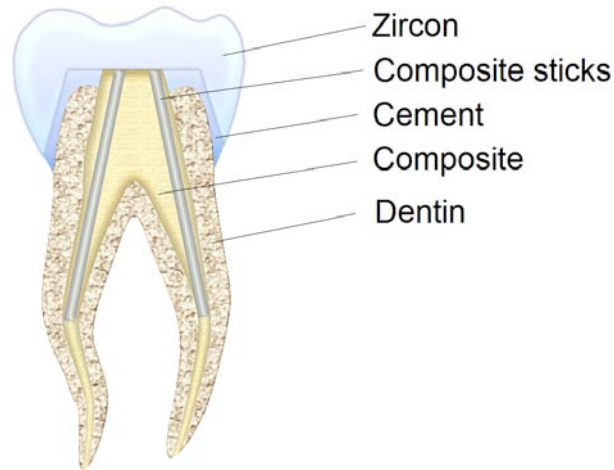


Fig 1. Schematic representation of the cross section of the tooth after root canal treatment and crown sticking zircon.

Analysis of the figure shows that after drilling and cleaning the canals of the tooth, composite sticks are being applied to meet them and to maintain the crown. This treatment is widely used to reduce the risk of separating themselves from the crown of the tooth root. At a later stage the hole is flooded with composite filler and zirconium crown is appended.

Another case is that the teeth have earlier fillings, as for example those shown in Fig 2.

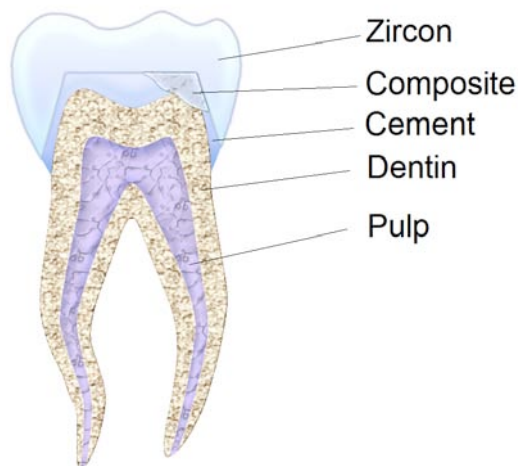


Fig 2. Schematic representation of the tooth in cross section with composite filler

Figure 2 shows the tooth, where the partial filling defect caused by the break off a part of the tooth. On such a prepared tooth crown zirconium is appended.

Sometimes, the dentist during root canal treatment or disposal of the loss of Class IV, V loses the layer above the gum of the tooth, thus the need for a composite material to rebuild the tooth crown. Cavities of Class IV, V arise as a result of the development of caries in the contact surface, usually these are very large cavities occupying half of the tooth. The loss may also come as a result of trauma to the tooth fractures. With this size of the defect must be considered an indirect method of reconstruction of the tooth (veneer, crown piece) or direct (filling). Sporadic case of attachment of zirconium in healthy teeth are hard to remove stains while whitening your teeth, as shown in Fig 3.



Fig 3. Schematic presentation of the tooth in cross section with appended crown zircon.

By modeling the in vivo environment, where patients previously treated for a tooth crown is appended zircon, you will find that there comes to be bonded multilayer which could be schematically represented as in Fig 4.

Such join may be the problem in evaluating the connection strength, adhesion strength, which is why a study should be made in different groups that make up the whole system shown in Figure 4: zircon - cement - composite, composite - bond - dentine, zircon - cement - dentine . The above-mentioned components of the connection will be tested in fatigue. The research is to demonstrate which of the components you need to pay special attention when preparing the surface and connecting the same procedure to connect the two. Designated durability and strength of such a facility will be used to further analyze whether the product (glue) meets the expectations of dentists and patients, and that you will not need replacement binding agent. The biggest problem is to produce a micro sample study because each sample must be cut along the axis of the tooth and needs to be maintained parallel and perpendicularity of the walls. Literature review points to the conclusion that the tested sample, due to their shape must be placed either in a block of plaster, latex or acrylic completely flooded.

Placement of the tooth in the block cannot be accidental, you need to keep the axis of the tooth, which is not easy, because each tooth from an anatomical point of view is different. Analyzing the structure of the tooth (Fig. 5) can be seen that in the midst of a solid tooth is little hole, which is filled with pulp - unripe connective tissue, heavily innervated and vascularized, which when cutting with the saw Isomet 4000 will break off the entire length of the tooth two pieces.

3. Summary

There were shown three offers of tested samples, in which is a multi-layer adhesion. For the study of sustainability and strength of connections must be extracted three options glued connections. The article presents the problems associated with obtaining samples of a particular size. Is related to anatomy of molars. The above article is to present the problems that have to face taking a materials testing included in biomechanics. Literature review has allowed to conclude that the research shall be used only on and off healthy teeth after orthodontic extractions. Authors of articles trying to realize



Fig 4. Schematic presentation of multilayer laminated connections

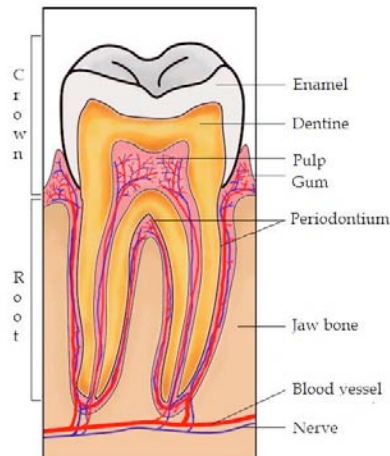


Fig 5. Schematic presentation of the structure of the tooth.

that such cases is very small even for purely economic. Do not be moved by the problem of research on the teeth that are already dead teeth (root canal treated teeth) or teeth that have been filling the cavities.

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