

COMPARISON OF THE QUALITY OF ROOT CANAL FILLING OF PERMANENT TEETH USING DIFFERENT SEALERS IN AN EXPERIMENTAL

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Annotation. Currently, sealers based on epoxy resins (“AN Plus”, “Dentsply Sirona”; “ADSEAL”, “META”; “VioSeal”, “SPIDENT”) “GUTTASILER PLUS-PASTE”, “Omega-Dent”, etc.). Relatively recently, an innovative material for obturation of root canals, which is an “active” epoxy resin, was registered in the Republic of Belarus - “BJM Root Canal Sealer” (“BJM Lab”). The IABT (Immobilized Antibacterial Technology) antibacterial technology is based on the addition of Biosafe HM4100 (BioSafe Inc.) quaternary ammonium compound molecules to the sealer. The mechanism of action of these positively charged molecules is associated with electrostatic interaction with negatively charged bacterial cells, which leads to a change in the permeability of their membranes and the subsequent death of microorganisms [1]. Among the important properties of the BJM Root Canal Sealer are high radiopacity, good high wettability and flow (greater than many other epoxy resin sealers), long-term stability due to good sealing and moderate flexibility, which prevents cracking of the cured material, as well as low shrinkage [1]. This sealer is universal because it can also be used change with cold, heated and thermoplasticized gutta-percha [1]. Also in recent years, 2 bioceramic (calcium silicate) sealers “Dia-Root” have been registered Biosealer" (DiaDent Group International) and "Sure-Seal Root" (Sure Dent Corporation). The advantages of this group are high radiopacity and antibacterial effect (due to pH more than 12.0) [1]. The disadvantages of bioceramic sealers are ease of use (available in the form of ready-to-use pastes, optimal working time and curing time), lack of shrinkage, biocompatibility, chemical adhesion to dentin, osteogenic properties, micro sealers include their high cost and difficulty in removing them from the root canal if necessary A few scientific publications are devoted to the comparison of bioceramic sealers with sealers based on epoxy resins [2, 3], which determines the relevance of this study.

Keywords: canal filling, chemical adhesion, osteogenic, micro sealers, root canal, bacterial cells.

Purpose of the study: to compare the quality of root canal filling of permanent teeth using various sealers in the experiment.

Materials and research methods.

The study was carried out on remote teeth for orthodontic indications. premolars. After creating the endodontic access, pulp extirpation and root canal navigation were carried out, the working length was determined (with x-ray confirmation), mechanical testing was performed (up to size 35/04) and medicinal (sodium hypochlorite, EDTA, saline) treatment of root canals and drying them with paper points. Obturation of the root canals was carried out using the lateral condensation method using sealers “Dia-Root Bioscaler”, “DiaDent Group International” (group 1, p-11, bioceramics), “BJM Root canal sealer”, “BJM Lab” (group 2, p -12, epoxy resin) and Sure-Seal Root, Sure Dent Corporation (group 3, n=12, bioceramics). Further space The access area was filled with glass ionomer cement. The teeth were then stored for 48 hours under 100% humidity. Next, the teeth were dried and varnished, 2 mm away from the apex, so that the dye could enter the root canal only through the apical region. After the varnish had dried, the teeth were placed in a 2% methylene blue solution for 48 hours. After a given exposure, the teeth were removed, the varnish layer was removed, and 2 root cuts were made at a distance of 2 and 5 mm. from the apex using a diamond separation disc. The resulting tooth fragments were photographed perpendicular to the cut projection using a digital camera with a macro lens. Description of qualitative characteristics was carried out in the form of absolute values and relative frequencies in percent. The significance of differences when comparing two independent groups was determined using the F test (two-sided version of Fisher's exact test) with a critical significance level of 0.05 [5].

Research results and discussion.

In the sample as a whole, there was no dye penetration In 33 samples (94.3%) at a distance of 2 mm from the apex and in 34 samples (97.1%) at a distance of 5 mm from the apex, which is evidence indicates the high quality of root canal obturation. Information about the penetration of dye through the apical opening of root canals in formed groups groups are presented in .

It was found that when cutting roots at a distance of 2 mm from the root apex in group 1, penetration of the dye between dentin and obturation materials was absent in 10 out of 11 samples (90.9%), which did not differ statistically from similar results in group 2 (in 11 out of 12 samples, 91.7%, $F=1.0$, $p>0.05$) and in group 3 (in 12 out of 12 samples, 100%, $F=0.5$, $p>0.05$). A similar pattern was revealed when comparing cuts of tooth roots at a distance of 5 mm from the root apex: in group 1, dye penetration was absent in 10 out of 11 samples (90.9%), in group 2 in 12 out of 12 samples (100%, $F=0.5$, $p>0.05$) and in group 3 in 12 out of 12 samples (100%, $F=0.5$, $p>0.05$). It should be noted that in group 3 (“Sure-Seal Root”, “Sure Dent Corporation”) penetration of the dye through the apical opening of the tooth roots was not detected in any of the cases when cutting the roots at a distance of both 2 mm and 5 mm.

Conclusions.

1. In the entire sample, the proportion of samples without dye penetration at a distance of 2 and 5 mm from the apex was 94.3% and 97.1%, respectively. 2. The proportion of samples where there was no penetration of the dye between dentin and obturation materials, informed groups was not statistically different. 3. In group 3, penetration of the dye between dentin and obturation materials was not detected in any of the cases.

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