

## **Medical-economic justification of a material choice for retrograde filling of canalis radialis at apicectomy in budgetary medical and preventive treatment facility**



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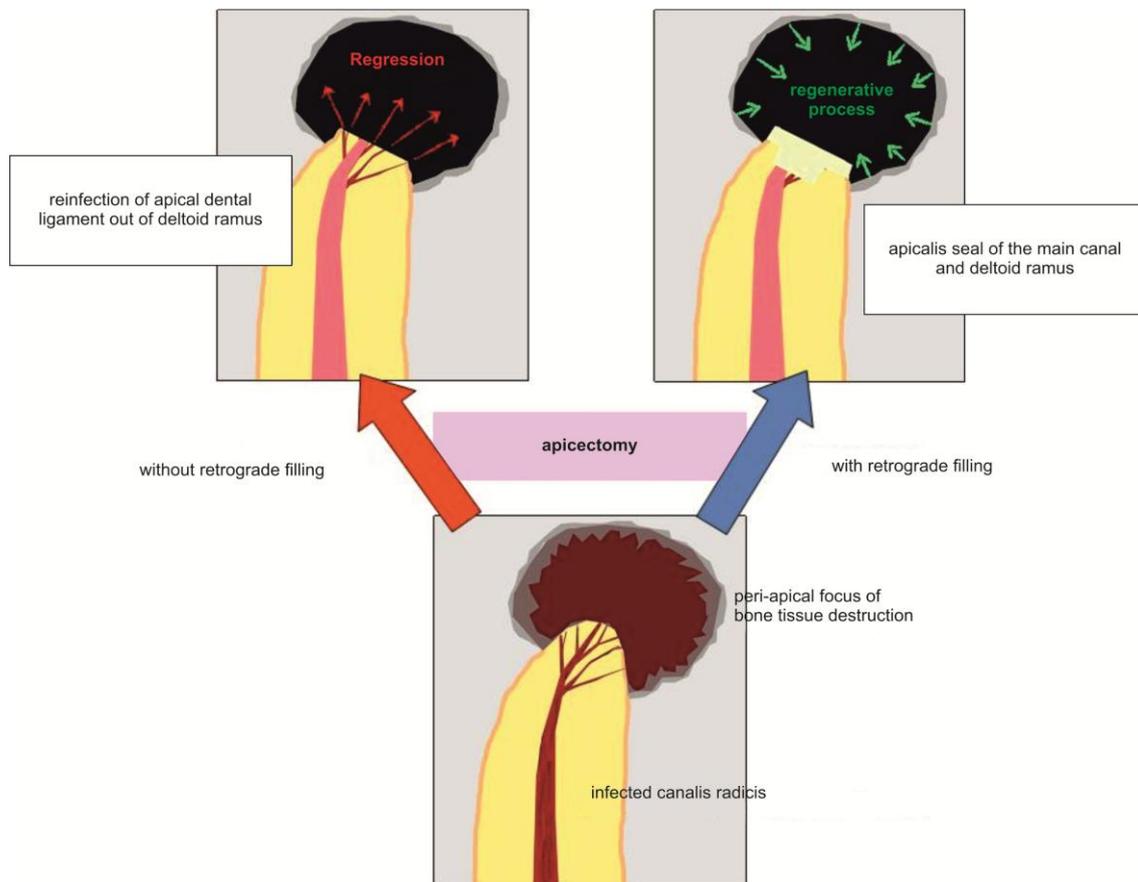


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The problem of chronic periodontitis and its complications effective treatment remains one of the most important and actual problems in modern stomatology. High prevalence of this type of pathology dictates the need of search of effective methods of treatment. Now, along with the improvement of techniques and technologies of endodontic treatment of chronic periodontitis destructive forms, actively introducing dental surgery among which the most widespread is apicectomy (1, 2). The most important component of this operation is retrograde filling of canalis radialis. As indications for carrying out this manipulation are considered: poor filled canalis radialis with presence of metal parts in it, an obliteration of the root channel with the secondary dentine, the long and bent canalis radialis with apical deltas, deltoid canaliculis or choanoid terminal parts of canalis radialis, inlays, dental cores, porcelain fused metal or other permanent structure in combination with above-mentioned states (1).

Retrograde filling of canalis radialis, when apicectomy, is carried out extremely rare in our country (3) and it is connected with complexity of performance of this manipulation, surgeons-dentist's lack of skills of dental tissue preparing, mixing and clinical use of dental restoration materials. At the same time this stage is obligatory since allows not only to provide apical seal of the main canalis radialis, but also to isolate apical deltas canaliculis which are the vessel of pathogenic flora and a source of apical dental ligament constant reinfection (picture 1). The lowest clinical efficiency of apicectomy which is carried out in dental medical and preventive treatment facility: according to the data of literature, only 8% of such operations are successful and leads to a full reparation of a peri-apical area bone tissue, is a consequence of underestimation of a retrograde filling role.



Picture 1. The influence of retrograde filling on the result of apicectomy (scheme).

Implementation of a retrograde filling method in practical stomatology substantially restrains by lack of effective, biocompatible and available for a wide range of the doctors materials, allowing to fill up qualitatively a cavity in the area of resect tooth root apex. The amalgam applied earlier for these purposes almost completely disappeared from stomatology. The efficiency of the glass-ionomer and other polymeric cements may be discussed a lot, because its full ripening requires isolation of a restoration from moisture for 24 hours. In this regard so-called "dentine substitutes", for example, "ProRoot MTA" (Dentsply) and "Biodentine" (Septodont) are of interest. However, despite high clinical efficiency, these materials didn't find broad application in practical stomatology, first of all, because of their high cost. In this regard domestic analogs of these materials, especially for the budgetary medical and preventive treatment facility, are considerably attractive.

We have a positive experience of clinical use of the material "Rootdent" (TehnoDent) (pictures 2, 3) for retrograde canalis radialis filling. Unlike other domestic materials of similar compositions, it has the radio density (picture. 4), superior, comfortable for the doctor, handling properties, it is hardening in conditions of the oral cavity with in the time provided in instruction and under the dentist supervision. Unlike foreign analogues "Rootdent" has a cost, making it available for the dental attendance in budgetary medical and preventive treatment facility, including in the area of compulsory health insurance (picture 5).



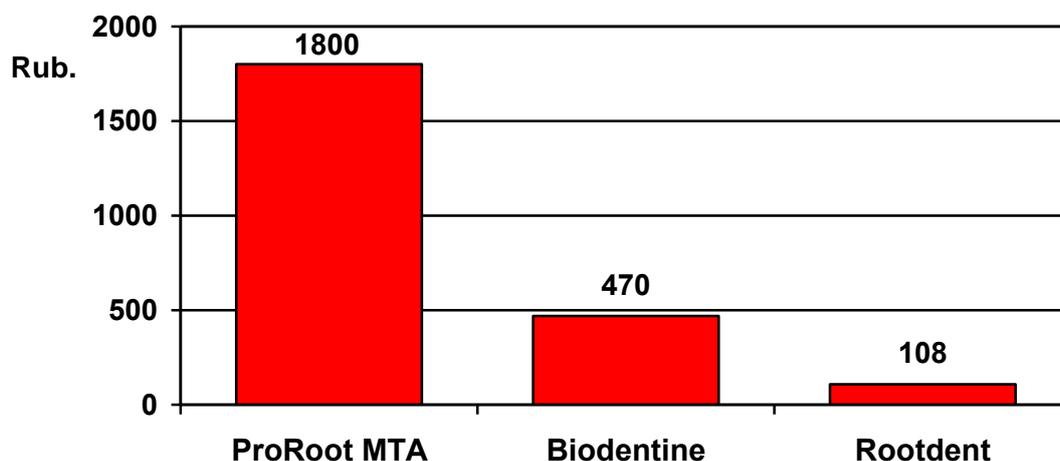
Picture 2. Material “Rootdent fast setting” (TehnoDent).



Picture 3. Material “Rootdent of a long term hardening” (TehnoDent).



Picture 4. Experimental study of radio density of "Rootdent" material on removed teeth: the radio density of the apical root fillings made of this material exceeds dentin radio density

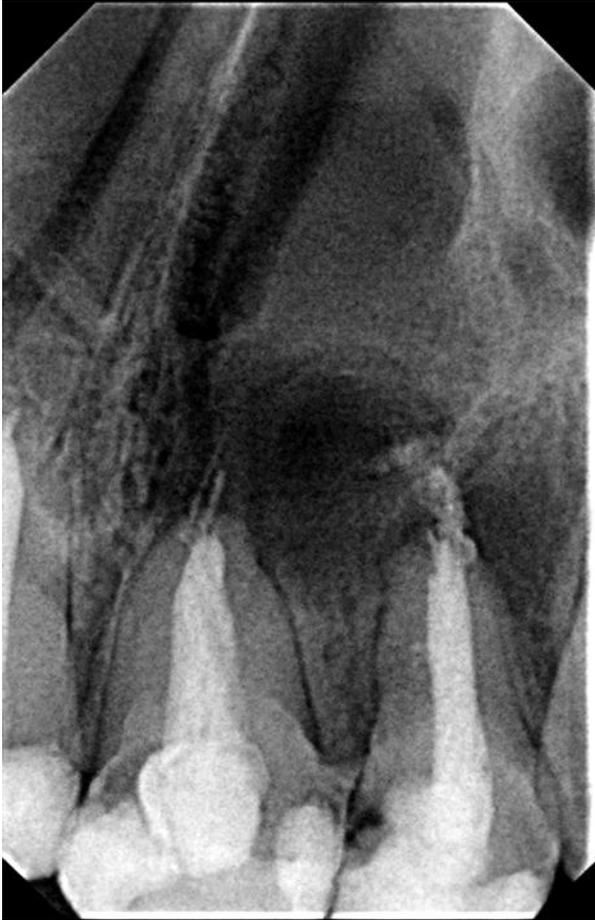


Picture 5. The cost of one dose of different materials for canal retrograde filling (in rubles)

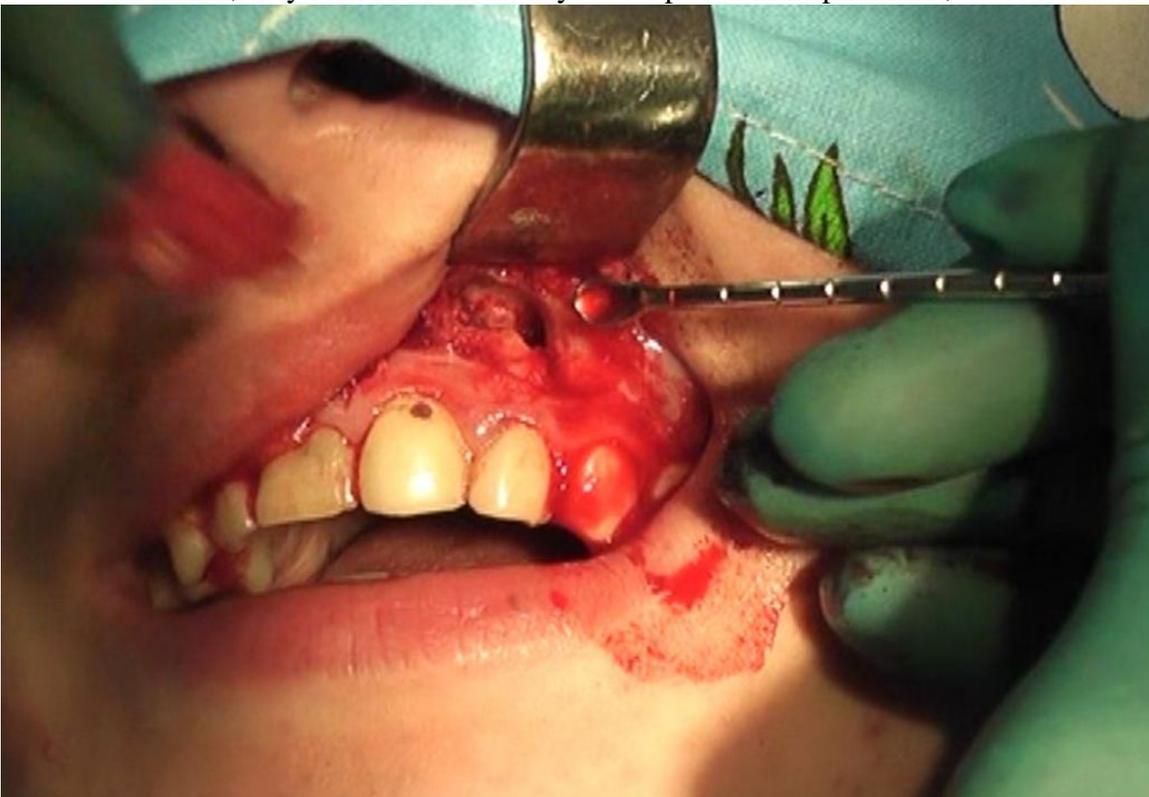
The powder of "Rootdent" material contains oxides of calcium, silicon, aluminum and zirconium. This material is mixed with using the distilled water. "Rootdent" is produced in two options: fast setting and long term hardening. Working hours of fast setting material is 2-4 min., hardening time – 10-15 min. Working hours of a long term hardening material is 10-12 min. "Rootdent" completely hardens in the conditions of an oral cavity in a period of 4 to 24 hours.

During hardening the calcium oxide, interacting with the distilled water, turns into the calcium hydroxide providing high alkalinity of media (pH 12,8). Then noncrystalline calcium hydroxide reacts with oxides of silicon and aluminum, forming the active silicates strengthening a cement matrix. The alkaline cement, formed after the processes of hardening, has bactericidal properties, stimulates processes of an apexogenesis in the treatment of teeth with open apex, optimizes bone tissue regeneration, stimulates the formation of secondary dentine in the treatment of deep caries. The material has high biocompatibility, low solubility and sufficient mechanical strength.

Our experience of clinical use of "Rootdent" material during apicectomy is presented on pictures 6-9.



Picture 6. Case S., 19 years old: radicular cyst of super-maxilla portion 21, 22



picture 7. Apicectomy of teeth 21, 22: cyst decapsulation.



Picture 8. Retrograde filling of canalis radiceis 21 and 22 with “Rootdent” material (TehnoDent)



Picture 9. Case S., 19 years old: in a 1,5 month after operation: there are signs of bone tissue regeneration and reducing the defect size, the apical restoration is preserved determined on the X-ray picture

The use of the "Rootdent" material is necessary in the following clinical situations:

- retrograde filling of the root canal during apicectomy;
- filling of the apical portion of the canal at incomplete root formation of the tooth;
- closing of burst bifurcation and trifurcate of roots, paries of a crownwork and dental root a fang at a sub gingival arrangement of a punched opening;
- imposing of medical laying at treatment of deep caries;
- a direct and indirect covering of dental pulp at treatment of a pulpitis by a biological method;
- a tooth pulp stump covering after a pulpotomy at treatment of a pulpitis by method of vital amputation;
- endodontal treatment of second teeth with incomplete formation of roots (stimulation of processes of an apexogenezis and apexification).

Thus, "Rootdent" (TehnoDend) should be considered as the material of choice in the provision of dental care in budgetary medical and preventive treatment facility, including in the area of compulsory health insurance, as available to a wide range of dentists alternative to the more expensive foreign analogues.

### **Literature**

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