
A.V. Larinskaya, A.V. Yurkevitch, I.D. Ushnitsky, T.E. Kruglov

THE COMPARATIVE CHARACTERISTIC OF MODERN ENDOGERMETICS

ABSTRACT

The epidemiological researches in Russia demonstrate the prevalence of caries among the population that determines the frequency of its complications and endodontic treatment [1, 3, 10, 12, 13]. It needs the improvement of effective endodontic treatment that is a current odontology problem [8, 15- 17].

The efficiency of endodontic treatment depends on quality of preparation and sealing of the tooth root channel. At the same time clinical performance and biological compatibility of widespread endogermetics in dental practice is various since there is a direct interrelation between the choice of sealing material, method of root channel obturation and the favorable prognosis after treatment.

There are many technics of root channel obturation in endodontic treatment complications of caries, each of which has the advantages and disadvantages. The most important of them from the clinical point of view is a method of root channel obturation by gutta-percha points and endogermetics. At the same time various materials are applied to channels sealing obturation. Zincum-oxide-eugenol pasta is the cements modified for endodontic use. Their main property is the bactericidal effect. Sealers containing a calcium hydroxide, have antimicrobial activity, osteogene effect. Meanwhile the sealers containing a formic aldehyde have high toxicity. Nowadays polymers are widely applied in endodontic practice. Advantages of this group of sealers are good handling properties, adhesion, they aren't dissolved under the influence of tissue liquid, have dimensional stability, are indifferent to periodont. At the same time the analysis of research data of density of root channels obturation by scanning acoustic and optical microscope characterizes the adequate obturation of root channels.

For the last decade a large amount of new materials for root channels was offered. There are still attempts of creation of new germetics, new technologies are being developed, which will have positive effect to more predictable and reliable treatment of caries complications, promoting teeth conservation.

Keywords: complications of caries, endodontics, sealing materials, obturation of root channels, bactericidal action, biocompatibility.

REFERENCES

1. Borovskiy E.V. Sostoyanie endodontii v tsifrah i faktah [Endodontics state in numbers and facts] Klinicheskaya stomatologiya [Clinical odontology], Moscow, 2003, No 1, p.38-40. Goryilev A.A. Laboratorno-klinicheskoe issledovanie effektivnosti plombirovaniya kornevykh kanalov materialom na osnove sinteticheskogo polimera [Laboratory clinical trial of root channels sealing efficiency on the basis of synthetic polymer] : avtoref. diss. ... kand.med.nauk [dissertation abstract. ... candidate of medical sciences]. Moscow, 2009, 21 p.
2. Dyibov D.A., Kruglov T.E. Izuchenie chastoty vozniknoveniya retsiviruyushchego i vtorichnogo kariesa u zhiteley Amurskoy oblasti [Studying of frequency of developing of recurrent and secondary caries among residents of the Amur region] Stomatologiya – nauka i praktika, perspektivy razvitiya materialy nauchno-prakticheskoy konferentsii, posvyaschennoy 90-letiyu so dnya rozhdeniya L. P. Ivanova. [Stomatology – science and practice, the prospects of development, materials of the scientific and practical conference devoted to the 90 anniversary of L.P. Ivanov]. Volgograd, 2017, p.47-50.
3. Lutsкая I. K. Obosnovanie vyibora endodonticheskogo lecheniya [Choice of the endodontic treatment]. Novoe v stomatologii [New in odontology]. Moscow, 2001, No 2, p.28-30.
4. Makedonova Yu.A. Sravnitel'naya harakteristika effektivnosti materialov pri plombirovanii kanalov korney zubov s intaktnym pe-riodontom [The comparative characteristic of efficiency of materials for root channels sealing with intact periodontium]: avtoref. diss. ... kand. med.nauk [thesis abstract ... candidate of medical sciences]. Volgograd, 2012. 23 p.
5. Makedonova Yu.A. Firsova I.V. Germetiziruyushchaya sposobnost novogo obtura-tsionnogo materiala dlya kornevykh kanalov «REAL SEAL» s tehnologiyey «RESILON» [The germetic ability of new obturative material for root channels «REAL SEAL» with RESILON technology] Saratovskiy nauchno-meditsinskiy zhurnal [Saratov scientific and medical magazine]. Saratov, 2012, No 1. p.111-113.
6. Malyutina N.N., Taranenko L.A. Patofiziologicheskie i klinicheskie aspekty voz-deystviya metanola i formaldegida na organizm cheloveka [Pathophysiological and clinical aspects of impact of methanol and formic aldehyde on the human body] Sovremennyye problemy nauki i obrazovaniya [Modern problems of science and education]. Moscow, 2014, No 2, p.36-37.
7. Shiryak T.Yu. Saleev R.A., Urazova R.Z. Potrebnost v lechenii oslozhnennogo kariesa vremennykh zubov u detey [The need for treatment of the complicated caries of temporary teeth at children] Kazanskiy meditsinskiy zhurnal [Kazan medical magazine]. Kazan, 2012, V.93, No 4.p.634-637.
8. Firsova I.V., Makedonova Yu.A., Trigolos N.N. Rol germetiziruyushchey sposobnosti silerov v uspe-he endodonticheskogo lecheniya [A role of the germetic ability of sealers in successful endodontic treatment] Sovremennyye problemy nauki i obrazovaniya [Modern problems of science and education], 2014, No1; URL: www.science-education.ru/115-11915 (data obrascheniya [date of the address]: 06.10.2017).
9. Baginskiy A.L. Chizhov Yu.V. Ushnitskiy I.D. [i dr.] Stomatologicheskii status i sotsialno-gigienicheskaya otsenka kornykh zhiteley Dolgano-Nenetskogo munitsipalnogo rayona Krasnoyarskogo kraya i Respubliki Saha (Yakutiya) [The dental status and social-hygienic assessment of aboriginals of the Dolgan-Nenets municipal district of Krasnoyarsk Krai and Republic of Sakha (Yakutia)] Aktualnyye problemy i perspektivy razvitiya stomatologii v usloviyakh severa. Sbornik statey mezhregionalnoy nauchno-prakticheskoy konferentsii, posvyaschennoy 95-letiyu stomatologicheskoy sluzhby Respubliki Saha (Yakutiya) [Current problems and prospects of odontology development in the North conditions. The collection of articles of the transregional scientific and practical conference devoted to the 95 anniversary of dental service of the Republic of Sakha (Yakutia)], Yakutsk, 2015, p. 100-107.
10. Kosilova A. S., Oskolkova D.A., Pleshakova T.O. Sravnitel'naya harakteristika sovremennykh silerov i predpochteniya vrachey-stomatologov [Comparative characteristic of modern sealers and preference of dentists] Problemy stomatologii [Odontology Problems]. Moscow, 2012, No. 5, p. 26-30.
11. Larinskaya A.V., Yurkevich A.V., Mihalchenko V.F. Sovremennyye aspekty vnutrikanalnoy dezinfek-tsii pri lechenii oslozhnennykh form kariesa [Modern aspects of intra channel disinfection at treatment of the complicated caries]

- Klinicheskaya stomatologiya [the Clinical odontology]. Moscow, 2017, V.83. No 3. p.13-16.
12. Oskolskiy G.I., Ushnitskiy I.D., Zagorodnyaya E.B. Stomatologicheskii status naseleniya Dalnevo-stochnogo regiona [Dental status of the population of the Far East region] *Endodontiya Today*. [Endodontics Today]. Moscow, 2012, No 3. p.10-14.
 13. Severina T.V. Issledovanie kachestva prisoedineniya silerov k stenke kornevogo kanala i guttaperchevym shtiftam [Research of quality of sealers accession to the wall of the root channel and guttapercha points] *Mezhdunarodnyy zhurnal prikladnykh i fundamentalnykh issledovaniy* [International magazine of applied and basic researches]. Moscow, 2014, No 2. p.154-158.
 14. Semenov A.D., Ushnitskiy I.D., Egorov R.I. Stomatologicheskii status zhiteley promyshlennykh rayonov Respubliki Saha (Yakutiya) [The dental status of inhabitants of industrial regions of the Sakha Republic (Yakutia)] *Aktualnyye problemy i perspektivy razvitiya stomatologii v usloviyakh severa. Sbornik statey mezhhregionalnoy nauchno-prakticheskoy konferentsii, posvyaschennoy 95-letiyu stomatologicheskoy sluzhby Respubliki Saha (Yakutiya)* [Current problems and the prospects of odontology development in the North conditions. The collection of articles of the transregional scientific and practical conference devoted to the 95 anniversary of dental service of the Sakha Republic (Yakutia)]. Yakutsk, 2015. p.86-90.
 15. Suvyirina M.B., Yurkevich A.V. Otsenka rasprostranennosti nekarioznykh porazheniy tverdykh tkaney zubov u vzroslogo naseleniya (na primere Amurskoy oblasti) [Assessment of prevalence of non-carious lesions of firm tissues of teeth among adult population (on the example of the Amur region)] *Vestnik Volgogradskogo gosudarstvennogo meditsinskogo universiteta* [Bulletin of the Volgograd state medical university]. Volgograd, 2017, V. 64. No 4, p.96-98.
 16. Ushnitskiy I.D. Pokazateli porazhennosti kariesom zubov u nase-leniya Yuzhnoy Yakutii [Prevalence indicators of teeth caries among the population of South Yakutia] *Dalnevostochnyy meditsinskiy zhurnal* [Far East medical magazine]. Chabarovsk, 2000, No 2, p.55-56.
 17. Holodovich O.V. Primenenie endogermetikov na osnove polidime-tilsiloksana v kompleksnom lechenii bolnykh s hronicheskimi formami pulpita [Use of endosealers on the basis of polydimethylsiloxane in complex treatment of patients with chronic forms of pulpitis] : avtoref. diss. ... kand.med.nauk [thesis abstract... candidate of medical sciences]. Voronezh, 2011, 23 p.
 18. Al-Khatib Z.Z. The antimicrobial effect of various endodontic sealers. / Z.Z. Al-Khatib, R.H. Baum, D.R. Morse [et. al] // *Oral Surgery, Oral Medicine and Oral Pathology*. – 1990. – №70. – P.784-790.
 19. Araki K. Indirect longitudinal cytotoxicity of root canal sealers on L929 cells and human periodontal ligament fibroblasts / K. Araki, H. Suda, L.S. Spangberg // *Journal of Endodontics*. – 1994. – №20. – P.67-70.
 20. Araki K. Excretion of ¹⁴C-formaldehyde distributed systemically through root canal following pulpectomy / K. Araki, H. Isaka, T.Ishii [et. al] // *Endodontics and Dental Traumatology*. – 1993. – №9. – P. 234-239.
 21. Beltes P. In vitro evaluation of the cytotoxicity of calcium hydroxide-based root canal sealers / P. Beltes, E. Koulaouzidou, V.Kotouala [et. al] // *Endodontics and Dental Traumatology*. – 1995. – №11. – P.245-249.
 22. Cohen B.I. Evaluation of the release of formaldehyde for three endodontic filling materials / B.I. Cohen, M.K. Pagnillo, B.L. Musikan [et. al] // *Oral Health*. – 1998. – №88. – P.37-39.
 23. Ersev H. Cytotoxic and mutagenic potencies of various root-canal-filling materials in eukaryotic and prokaryotic cells in vitro / H. Ersev, G. Schmalz, G. Bayirli [et.al] // *Journal of Endodontics*. – 1999. – № 25. – P.359-363.
 24. Geurtsen W, Leinenbach F, Krage T, Leyhausen G Cytotoxicity of four root canal sealers in permanent 3T3 cells and primary human periodontal ligament fibroblast cultures / W. Geurtsen, F. Leinenbach, T. Krage [et.al] // *Orals Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics*. –1998. – №85. – P.592-597.
 25. Huang F.M. Cytotoxicity of resin-, zinc oxide-eugenol-, and calcium hydroxide-based root canal sealers on human periodontal ligament cells and permanent V79 cells / F.M. Huang, K.W. Tai, M.Y. Chou [et.al] // *International Endodontic Journal*. – 2002. – №35. – P.153-158.
 26. Koch M.J. Formaldehyde release from root-canal sealers: influence of method // *International Endodontic Journal*. – 1999. – №32. – P.10-16.
 27. Lin L. M., Gagler P., Langelan K. A histopatologic and hislobacteriologic study of 35 periapical endodontic surgical of specimens / L.M. Lin, P. Gagler, K. Langelan // *J. Endod*. – 2006. – Vol.3. – №8. – P.58-60.
 28. Mickel A.K. Growth inhibition of *Streptococcus anginosus* (milleri) by three calcium hydroxide sealers and one zinc oxide-eugenol sealer / A.K. Mickel, E.R. Wright // *Journal of Endodontics*. – 1999. – №25. – P.34-37.
 29. Osorio R.M. Cytotoxicity of endodontic materials / R.M. Osorio, A. Hefti, F.J. Vertucci // *Journal of Endodontics*. – 1998. – №24. – 91-96.
 30. Segura J.J. Effect of eugenol on macrophage adhesion in vitro to plastic surfaces / J.J. Segura, A. Jmenez-Rubio // *Endodontics and Dental Traumatology*. – 1998. – №14. – P.72-74.
 31. Spangberg L.S.W. AH-26 releases formaldehyde / L.S.W. Spangberg, S.V. Barbosa, G.D. Lavigne // *Journal of Endodontics*. – 1993. – №19. – 596-598.
 32. Telli C. Evaluation of the cytotoxicity of calcium phosphate root canal sealers by MTT assay / C. Telli, A. Serper, A.L. Dogan [et.al] // *Journal of Endodontics*. – 1999. – №25. – P.811-813.

The authors:

Larinskaya Anna Viktorovna - graduate student of odontology department of orthopedic odontology of The Far Eastern State Medical University. Tel: +7-914-159-56-24, e-mail address: nura.lar@mail.ru. Address: 35, Muravyev-Amursky St., Khabarovsk 680000;

Alexander Vladimirovitch Yurkevitch - dean of dental faculty of The Far Eastern State Medical University, head of odontology orthopedic department, PhD, associate professor. Tel: (4212) 625-888, e-mail address: dokdent@mail.ru. Address: 35, Muravyev-Amursky St., Khabarovsk 680000;

Ushnitskiy Innokentiy Dmitrievitch - head of the department of therapeutic, surgical, orthopedic odontology and odontology of children's age of Medical institute of NEFU, Yakutsk (Russia), PhD, professor. Tel: 89241708940, e-mail address: incadim@mail.ru;

Kruglov Taras Evgenyevitch - clinical intern of orthopedic odontology department of The Far Eastern State Medical University, tel: 8-965-675-42-40, e-mail address: krooglik95@yandex.ru. Address: 35, Muravyev-Amursky St., Khabarovsk 680000.