Bölüm 13

SÜT DİŞLERİNDE KULLANILAN İRRİGASYON SOLÜSYONLARINA GENEL BAKIŞ

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GİRİŞ

Kök kanal tedavisinin amacı; kök kanalı içerisinde enfeksiyona sebep olan mikroorganizmaların ve artık mikrobiyal içeriğin elimine edilmesi, kök kanal sisteminin hermetik olarak tıkanmasını sağlayarak mikroorganizmalarla rekontaminasyonun engellenmesi ve iyileşmenin gerçekleşmesidir.(1)

Süt dişi kök kanallarının kompleksliği, kanal içerisindeki sayısız istmus ve kanallar arası bağlantılar kök kanallarının önemli bir kısmına erişimi zorlaştırmaktadır. Kök kanallarının şekillendirilmesi tamamlandıktan sonra bile kanallarda mikroorganizma varlığı tespit edilmiş ve sadece kök kanal preparasyonu ile dentin tübüllerine invaze olan mikroorganizmaların tamamen elimine edilmesinin mümkün olmadığı gösterilmiştir.(2)

Kök kanallarındaki enfeksiyonun kontrolü, hem mekanik hem de kimyasal preparasyonunun birlikte uygulanmasıyla (kemomekanik preparasyon) mümkün olmaktadır. Süt dişi kök kanallarındaki düzensizliklerinin birçoğuna mekanik olarak ulaşmak mümkün olmadığı için süt dişlerinde irrigasyon daha fazla önem kazanmaktadır.(3)

Kök kanal tedavisinde kemomekanik preparasyon esnasında kullanılan irrigasyon solüsyonları;

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SONUÇ

Süt dişi kök kanal tedavilerinde kök kanal sisteminin dezenfeksiyonu başarının en önemli kriterlerinden biridir. Süt dişi kök kanal sisteminin kompleksliği ve apikal bölgedeki yan kanallar nedeniyle yalnızca mekanik preparasyon kök kanal sisteminin dezenfeksiyonunu sağlamada yetersiz kalmaktadır. Yüksek antimikrobiyal özellikleri, organik doku çözücü özelliği, düşük yüzey gerilimi, kolay uygulanabilirliği ve uygun maliyeti sebebiyle sodyum hipoklorit, süt dişi kök kanal tedavilerinde günümüzde halen en sık tercih edilen irrigasyon solüsyonu olma özelliğini korumaktadır. Fakat inorganik artıkları uzaklaştırmadaki yetersizliği nedeniyle EDTA gibi şelayon ajanları ile kullanımları önerilmektedir.

KAYNAKLAR

1. Haapasalo, M., Endal, U., Zandi, H. Eradication of endodontic infection by instrumentation and irrigation solutions. *Endodontic topics*, 2005; *10* (1), 77-102.
2. Matsuo, T., Shirakami, T., Ozaki, K. An immunohistological study of the localization of bacteria invading root pulpal walls of teeth with periapical lesions. *J Endod*, 2003; *29* (3), 194-200.
3. Alacam, A. The effect of various irrigants on the adaptation of paste filling in primary teeth. *Journal of Clinical Pediatric Dentistry*, 1992; *16* (4), 243-246.
4. Çalışkan, M. K. (2006). *Endodontide Tanı ve Tedaviler*. (1.Baskı). İstanbul: Nobel Yayınları
5. West, J. D., Roane J. B., Goerig A. C. (1994). *Pathways of the pulp*. (6th edition). St. Louis: Mosby
6. Kandaswamy, D.Venkateshbabu, N. Root canal irrigants. *Journal of Conservative Dentistry*, 2010; *13* (4), 256-264.
7. Estrela, C., Estrela, C. R., Barbin, E. L. Mechanism of action of sodium hypochlorite. *Braz Dent J*, 2002; *13* (2), 113-117.
8. Buck, R. A., Eleazer, P. D., Staat, R. H. Effectiveness of three endodontic irrigants at various tubular depths in human dentin. *J Endod*, 2001; *27* (3), 206-208.
9. Siqueira, J. F., Rôças, I. N., Favieri, A. Chemomechanical reduction of the bacterial population in the root canal after instrumentation and irrigation with 1%, 2.5%, and 5.25% sodium hypochlorite. *J Endod*, 2000; *26* (6), 331-334.
10. Waltimo, T., Trope, M., Haapasalo, M. Clinical efficacy of treatment procedures in endodontic infection control and one year follow-up of periapical healing. *J Endod*, 2005; *31* (12), 863-866.
11. Berber, V. B., Gomes, B. P., Sena, N. T. Efficacy of various concentrations of NaOCl and instrumentation techniques in reducing Enterococcus faecalis within root canals and dentinal tubules. *Int Endod J*, 2006; *39* (1), 10-17.
12. Siqueira, J. F., Rôças, I. N., Souto, R. Actinomyces species, streptococci, and Enterococcus faecalis in primary root canal infections. *J Endod*, 2002; *28* (3), 168-172.

13. Öter, B. Topçuoglu, N. Tank, M. K. Çehreli, S. B. Evaluation of Antibacterial Efficiency of Different Root Canal Disinfection Techniques in Primary Teeth. *Photomed Laser Surg*, 2018; *36* (4), 179-184.
14. Goztas, Z., Onat, H., Tosun, G. Antimicrobial effect of ozonated water, sodium hypochlorite and chlorhexidine gluconate in primary molar root canals. *Eur J Dent*, 2014; *8* (4), 469-474.
15. Haapasalo, M., Shen, Y., Qian, W. Irrigation in endodontics. *Dent Clin North Am*, 2010; *54* (2), 291-312.
16. Serper, A. Ozbek, M. Calt, S. Accidental sodium hypochlorite-induced skin injury during endodontic treatment. *J Endod*, 2004; *30* (3), 180-181.
17. Hülsmann, M. Heckendorff, M. Lennon, A. Chelating agents in root canal treatment: mode of action and indications for their use. *Int Endod J*, 2003; *36* (12), 810-830.
18. Calt, S. Serper, A. Time-dependent effects of EDTA on dentin structures. *J Endod*, 2002; *28* (1), 17-19.
19. Toyota, Y., Yoshihara, T., Hisada, A., Yawaka, Y. Removal of smear layer by various root canal irrigations in primary teeth. *Pediatric Dental journal*, 2017; *27* (1), 8-13.
20. Demirel, A., Yüksel, B. N., Ziya, M. The effect of different irrigation protocols on smear layer removal in root canals of primary teeth: a SEM study. *Acta Odontol Scand*, 2019; *77* (5), 380-385.
21. Sceiza, M. F., Daniel, R. L., Santos, E. M. Cytotoxic effects of 10% citric acid and EDTA-T used as root canal irrigants: an in vitro analysis. *J Endod*, 2001; *27* (12), 741-743.
22. Serper, A., Calt, S., Dogan, A. L. Comparison of the cytotoxic effects and smear layer removing capacity of oxidative potential water, NaOCl and EDTA. *J Oral Sci*, 2001; *43* (4), 233-238.
23. Mohammadi, Z., Abbott, P. V. The properties and applications of chlorhexidine in endodontics. *Int Endod J*, 2009; *42* (4), 288-302.
24. Gomes, B. P., Vianna, M. E., Zaia, A. A. Chlorhexidine in endodontics. *Braz Dent J*, 2013; *24* (2), 89-102.
25. Leonardo, M. R., Tanomaru Filho, M., Silva, L. A. In vivo antimicrobial activity of 2% chlorhexidine used as a root canal irrigating solution. *J Endod*, 1999; *25* (3), 167-171.
26. Güler, Ç. Gürbüz, T. Yılmaz, Y. The clinical success of different root canal treatments in primary molars. *Cumhuriyet Dental Journal*, 2013; *16* (1), 31-39.
27. Krishnamurthy, S.Sudhakaran, S. Evaluation and prevention of the precipitate formed on interaction between sodium hypochlorite and chlorhexidine. *J Endod*, 2010; *36* (7), 1154-1157.
28. Svec, T. A.Harrison, J. W. The effect of effervescence on debridement of the apical regions of root canals in single-rooted teeth. *J Endod*, 1981; *7* (7), 335-340.
29. Block, S. S. (1991). *Disinfection, sterilization and preservation.* (4 th. edition). Philadelphia: Lea&Febiger
30. Shiozawa, A. Characterization of reactive oxygen species generated from the mixture of NaClO and H_2O_2 used as root canal irrigants. *J Endod*, 2000; *26* (1), 11-15.
31. Singla, M. G., Garg, A.Gupta, S. MTAD in endodontics: an update review. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics*, 2011; *112* (3), e70-76.

32. Torabinejad, M., Shabahang, S., Aprecio, R. M. The antimicrobial effect of MTAD: an in vitro investigation. *J Endod*, 2003; *29* (6), 400-403.
33. Chiniforush, N., Pourhajibagher, M., Shahabi, S. Clinical Approach of High Technology Techniques for Control and Elimination of Endodontic Microbiota. *J Lasers Med Sci*, 2015; *6* (4), 139-150.
34. Torabinejad, M., Cho, Y., Khademi, A. A. The effect of various concentrations of sodium hypochlorite on the ability of MTAD to remove the smear layer. *J Endod*, 2003; *29* (4), 233-239.
35. Shabahang, S.Torabinejad, M. Effect of MTAD on Enterococcus faecalis-contaminated root canals of extracted human teeth. *J Endod*, 2003; *29* (9), 576-579.
36. Mozayeni, M. A., Javaheri, G. H., Poorroosta, P. Effect of 17% EDTA and MTAD on intracanal smear layer removal: a scanning electron microscopic study. *Australian Endodontic Journal*, 2009; *35* (1), 13-17.
37. Tay, F. R., Hosoya, Y., Loushine, R. J. Ultrastructure of intraradicular dentin after irrigation with BioPure MTAD. II. The consequence of obturation with an epoxy resin-based sealer. *J Endod*, 2006; *32* (5), 473-477.
38. Tulsani, S. G., Chikkanarasaiah, N.Bethur, S. An in vivo comparison of antimicrobial efficacy of sodium hypochlorite and Biopure MTAD™ against enterococcus faecalis in primary teeth: A qPCR study. *Journal of Clinical Pediatric Dentistry*, 2014; *39* (1), 30-34.
39. Farhin, K., Viral, P. M., Thejokrishna, P. Reduction in Bacterial Loading Using MTAD as an Irrigant in Pulpectomized Primary Teeth. *Journal of Clinical Pediatric Dentistry*, 2015; *39* (2), 100-104.
40. Giardino, L., Ambu, E., Becce, C. Surface tension comparison of four common root canal irrigants and two new irrigants containing antibiotic. *J Endod*, 2006; *32* (11), 1091-1093.
41. Giardino, L., Ambu, E., Savoldi, E. Comparative evaluation of antimicrobial efficacy of sodium hypochlorite, MTAD, and Tetraclean against Enterococcus faecalis biofilm. *J Endod*, 2007; *33* (7), 852-855.
42. Purakkal, A.T., Peedikayil, F. C., Shibuvardhanan, Y. Comparison of smear layer removal by MTAD, TetraClean, QMix, NaOCL, coconut water, and saline as irrigating solutions in primary teeth: An in vitro study. *Journal of Dental Research and Review*, 2020; *7* (3), 97.
43. Stojicic, S., Zivkovic, S., Qian, W. Tissue dissolution by sodium hypochlorite: effect of concentration, temperature, agitation, and surfactant. *J Endod*, 2010; *36* (9), 1558-1562.
44. Torabinejad, M., Khademi, A. A., Babagoli, J. A new solution for the removal of the smear layer. *J Endod*, 2003; *29* (3), 170-175.
45. Stojicic, S., Shen, Y., Qian, W. Antibacterial and smear layer removal ability of a novel irrigant, QMiX. *Int Endod J*, 2012; *45* (4), 363-371.
46. Rasimick, B. J., Nekich, M., Hladek, M. M. Interaction between chlorhexidine digluconate and EDTA. *J Endod*, 2008; *34* (12), 1521-1523.
47. Ma, J., Wang, Z., Shen, Y. A new noninvasive model to study the effectiveness of dentin disinfection by using confocal laser scanning microscopy. *J Endod*, 2011; *37* (10), 1380-1385.
48. Dai, L., Khechen, K., Khan, S. The effect of QMix, an experimental antibacterial root canal irrigant, on removal of canal wall smear layer and debris. *J Endod*, 2011; *37* (1), 80-84.

49. Bocci, V. A. Scientific and medical aspects of ozone therapy. State of the art. *Arch Med Res*, 2006; *37* (4), 425-435.
50. Bocci, V., Grootveld, M., Baysan, A. (2004). *How ozone acts and exerts therapeutic effects.* (E. Lynch edition). London: Quintessence
51. Arita, M., Nagayoshi, M., Fukuizumi, T. Microbicidal efficacy of ozonated water against Candida albicans adhering to acrylic denture plates. *Oral Microbiol Immunol*, 2005; *20* (4), 206-210.
52. Nagayoshi, M., Fukuizumi, T., Kitamura, C. Efficacy of ozone on survival and permeability of oral microorganisms. *Oral Microbiol Immunol*, 2004; *19* (4), 240-246.
53. Pattanaik, B. Jetwa, D. Pattanaik, S. Manglekar, S. Naitam, D. N. Dani, A. Ozone therapy in dentistry: a literature review. *Journal of İnterdisciplinary Dentistry*, 2011; *1* (2), 87.
54. Azarpazhooh, A.Limeback, H. The application of ozone in dentistry: a systematic review of literature. *J Dent*, 2008; *36* (2), 104-116.
55. Nogales, C. G., Ferrari, P. H., Kantorovich, E. O. Ozone therapy in medicine and dentistry. *Journal of Contemporary Dental Practice*, 2008; *9* (4), 75-84.
56. Huth, K. C., Jakob, F. M., Saugel, B. Effect of ozone on oral cells compared with established antimicrobials. *Eur J Oral Sci*, 2006; *114* (5), 435-440.
57. Hems, R. S., Gulabivala, K., Ng, Y. L. An in vitro evaluation of the ability of ozone to kill a strain of Enterococcus faecalis. *Int Endod J*, 2005; *38* (1), 22-29.
58. Müller, P., Guggenheim, B.Schmidlin, P. R. Efficacy of gasiform ozone and photodynamic therapy on a multispecies oral biofilm in vitro. *Eur J Oral Sci*, 2007; *115* (1), 77-80.
59. Öter, B., Topçuog Lu, N., Tank, M. K. Evaluation of Antibacterial Efficiency of Different Root Canal Disinfection Techniques in Primary Teeth. *Photomed Laser Surg*, 2018; *36* (4), 179-184.
60. Cardoso, M. G., de Oliveira, L. D., Koga-Ito, C. Y. Effectiveness of ozonated water on Candida albicans, Enterococcus faecalis, and endotoxins in root canals. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics*, 2008; *105* (3), e85-91.
61. Baysan, A.Lynch, E. The use of ozone in dentistry and medicine. *Primary Dental Care*, 2005; *12* (2), 47-52.
62. Murakami, H., Mizuguchi, M., Hattori, M. Effect of denture cleaner using ozone against methicillin-resistant Staphylococcus aureus and E. coli T1 phage. *Dent Mater J*, 2002; *21* (1), 53-60.
63. Saini, R. Ozone therapy in dentistry: A strategic review. *Journal of Natural Science, Biology and Medicine*, 2011; *2* (2), 151-153.