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ORIGINAL ARTICLE

ANALYSIS OF THE EFFECTIVENESS OF USING A LASER PHOTODYNAMIC SYSTEM FOR THE TREATMENT OF CHRONIC APICAL PERIODONTITIS. CLINICAL CASES SERIES

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Abstract

Background/Aim: The objective of study analysis of the effectiveness of using a laser photodynamic system for the treatment of chronic apical periodontitis.

Materials and Methods: The study included 66 patients aged 18 to 60 years with a diagnosis of chronic apical periodontitis in whom 90 root canals were treated. The diagnosis was established on the basis of the patient's complaints, clinical and instrumental studies, X-ray data.

The patients were divided equally into two groups and underwent endodontic treatment. In the root canals of patients of the first group, disinfection was carried out by the method of photodynamic therapy. Then the canal was obturated with gutta-percha pins and sealer, the tooth was restored. In patients of the 2nd group, after instrumental and medical treatment, the root canals were sealed with a temporary material "Kalasept" (Sweden) based on calcium hydroxide, and the tooth was restored with a temporary glass ionomer cement "Vitremer" (3M ESPE).

process of the rarefaction focus.

Results: The evaluation of the results of treatment was carried out in terms of 1-14 days, 6 and 12 months after the final filling of the root canals. positive dynamics in a short time was observed in 93.9% of patients. cases in patients of the 1st group and in 72.7% in patients of the 2nd group. Complications arose in patients of the 1st group in 6.1% of cases. In the 2nd group in 27.3% of cases, which is almost 4.5 times more than in the 1st group. When comparing 2 methods of treatment after 6 months, clinical well-being was observed in patients of the 1st group in 96.9% and in the 2nd group in 81.8% of cases. The percentage of complications that occurred was 3.1% in patients of the 1st group and 18.2% in the 2nd group.

Complete healing of the focus in the bone tissue was observed in 84.8% of cases in patients of the 1st group and in 66.6% of cases in patients of the 2nd group. Partial healing of the bone tissue focus was observed in 18.1% and 15.1% of cases in the 1st and 2nd groups.

Conclusion: The use of laser radiation in preparing the root canal for obturation in the treatment of chronic forms of periodontitis made it possible to reduce the number of complications by almost 1.5 times and accelerate the healing process of the rarefaction focus.

Keywords: *laser, photodynamic system, chronic apical periodontitis*

Introduction

Apical periodontitis in dental practice is the third most common after dental caries and pulp diseases caused by persistent microbial infection within the root canal system of the affected toot[1]. Teeth that have inflammatory changes at the root apex are foci of chronic infection[2]. This is the reason for the considerable attention paid to this disease.[3,4] To date, the first place in the etiology of apical periodontitis is occupied by microbial flora. In the root canal, it is represented by bacteria of various genera and families, the most common of which are staphylococci and streptococci.[5,6] Microorganisms are present throughout the entire length of the root canal, including in the lateral branches, anastomoses and in the dentinal tubules at a depth of approximately 250 microns from the side of the tooth cavity.[7]

Currently, the main goal of endodontic treatment is the sterilization of the root canal system, the removal of the inflamed pulp and the remnants of the smeared layer of dentin.[8,9] Canal treatment with hand and machine tools, as well as irrigation using antiseptic solutions, reduces the number of bacteria hundreds of times.[10.11]

To date, practicing dentists prefer to start the treatment of apical periodontitis with a temporary filling of the root canal with a paste based on calcium hydroxide.[12-14] But the probability of its impact on some types of pathogenic microflora is different, and penetration into the depth of infected tissues is limited. Endodontic treatment performed in two visits is fraught with the risk of secondary infection of the root canal system[15]. In the literature, there is an opinion that it is possible to carry out high-quality treatment of chronic forms of periodontitis in one visit.[16,17]

To this day, a search is underway for drugs that would provide complete sterilization in the root canal without side effects.[18,19] Recently, in modern endodontics, laser radiation methods have been used for therapeutic purposes.[20-26] Helbo (Austria) presents one of them - photoactivated disinfection. Using HELBO Blue Photosensitizer, which diffuses into biofilms, the walls of bacterial cells are stained with light-sensitive molecules.[27-29] Next, the molecules are activated using laser light with a wavelength of 670–690 nm and an energy density of 75 mW/cm^2.[24] The absorption of light quanta by photosensitase molecules in the presence of oxygen leads to a photochemical reaction, as a result of which molecular triplet oxygen is converted into singlet oxygen, which destroys microorganisms in the biofilm. The objective of study analysis of the effectiveness of using a laser photodynamic system for the treatment of chronic apical periodontitis

Material and methods

The study included 66 patients aged 18 to 60 years with a diagnosis of chronic apical periodontitis in whom 90 root canals were treated. The diagnosis was established on the basis of the patient's complaints, clinical and instrumental studies, X-ray data.

The general state of health was good. Pregnant and lactating women, patients who underwent phototherapy were excluded from the study. Before the start of the study, a targeted radiography of each examined tooth was performed to determine the estimated length of the canal and its anatomy. After determining the working length using an apex locator in the root canals, instrumental processing was carried out using the crown method. Drug treatment was carried out with a 3% solution of sodium hypochlorite (more than 20 ml), the solution was applied at room temperature using an endodontic syringe and needle. Next, the canal was thoroughly washed with distilled water to wash out the antiseptic from the canal.

The patients were divided equally into two groups. In the root canals of patients of the first group, disinfection was carried out by the method of photodynamic therapy (figure 1). At working length, the Helbo Endo Blue solution was injected into the root canal using a sterile endodontic needle. The solution introduced into the channel was mixed with a hand tool, which was two sizes smaller than the top diameter. After that, activation was carried out with a laser beam for 120 seconds, introduced into the root canal with an endodontic emitter. Then the canal was obturated with gutta-percha pins and sealer, the tooth was restored. In patients of the 2nd group, after instrumental and medical treatment, the root canals were sealed with a temporary material "Kalasept" (Sweden) based on calcium hydroxide, and the tooth was restored with a temporary glass ionomer cement "Vitremer" (3M ESPE).

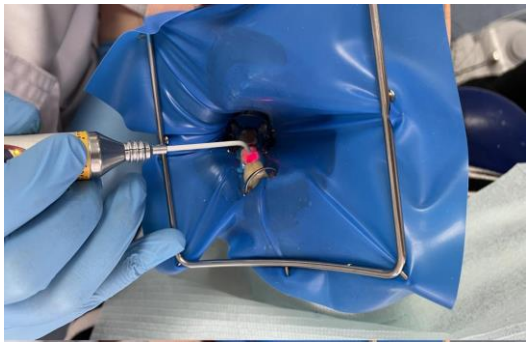

Figure 1. *Using a photodynamic laser in the root canal*

Results

The evaluation of the results of the treatment was carried out in terms of 1-14 days, 6 and 12 months after the final filling of the root canals. The values of clinical well-being in the treatment of chronic periodontitis using a laser photodynamic system and a preparation containing calcium hydroxide - Calasept are shown below in Figure 2.

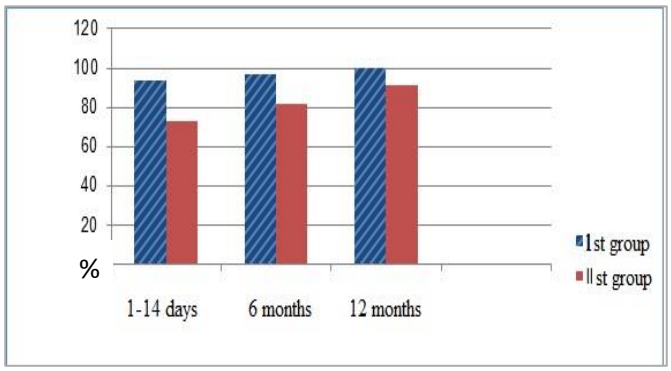

Figure 2. *Indicators clinical well-being of the treatment of chronic apical periodontitis using a laser photodynamic system and Calasept*

It is worth emphasizing that positive dynamics in a short time was observed in 93.9% of cases in patients of the 1st group and in 72.7% in patients of the 2nd group. Complications occurred in patients of the 1st group in 6.1% of cases. In the 2nd group in 27.3% of cases, which is almost 4.5 times more than in the 1st group. When comparing 2 methods of treatment, after 6 months, clinical well-being was observed in patients of the 1st group in 96.9% and in the 2nd group in 81.8% of cases. The percentage of complications that occurred was 3.1% in patients of the 1st group and 18.2% in the 2nd group. From which it follows that complications were observed in patients of the 2nd group almost 6 times more often than in the 1st group. When comparing two methods of treatment after 12 months, clinical well-being was noted in patients of the 1st group in 100% of cases, in patients of the 2nd group - in 90.9% of cases. Complications arose during this period in 9%.

X-ray examination was performed after 6 and 12 months to determine the degree of healing of the periapical rarefaction foci. A comparative analysis of the results of X-ray studies after 6 months in both groups of patients is shown in Figure 3.

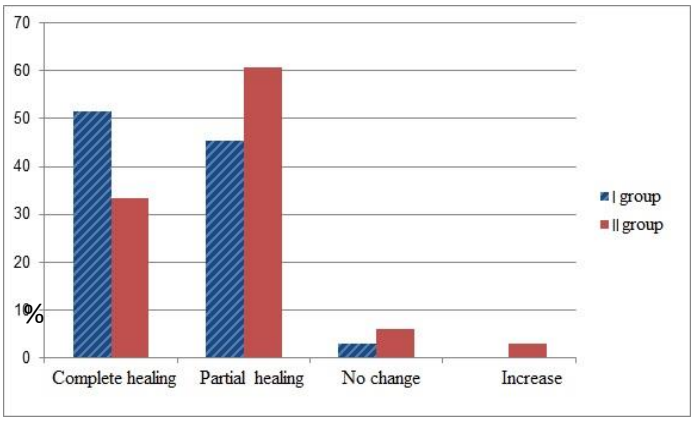

Figure 3. *The results of X-ray examination 6 months after treatment in groups I and II*

6 months after treatment, healing of the destruction focus in the bone tissue was observed in 51.5% of cases in patients of the 1st group and in 33.3% of cases in the 2nd group. Partial healing of bone tissue was observed in 45.4% of cases in patients of the 1st group and in 60.6% of cases of the 2nd group. No changes in radiographic parameters were observed in patients of the 1st group in 3.03% of cases and in 6.06% of patients from the 2nd group. It should be emphasized that one patient from the 2nd group showed an increase in the focus of destruction, which amounted to 3.03%. The patient was referred for root apex resection.

A comparative analysis of the results of X-ray examinations after 12 months in both groups of patients is shown in Figure 4.

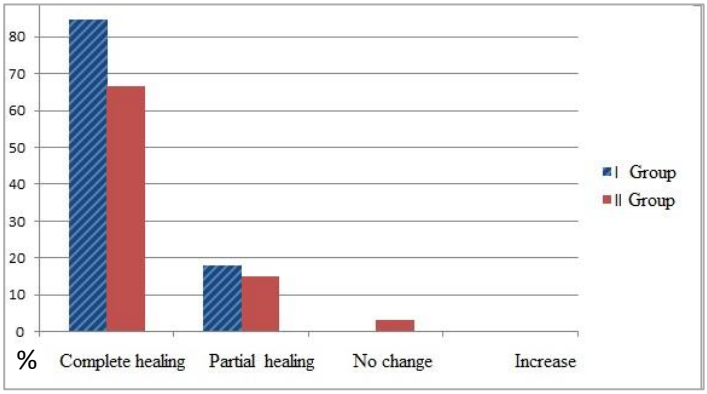

Figure 4. *The results of x-ray examination 12 months after treatment in groups I and II*

Complete healing of the focus in the bone tissue was observed in 84.8% of cases in patients of the 1st group and in 66.6% of cases in patients of the 2nd group. Partial healing of the bone tissue focus was observed in 18.1% and 15.1% of cases in the 1st and 2nd groups. In one patient from the 2nd group (3.03%), who is currently under dispensary registration, there were no changes in radiographic parameters.

Evaluating the results of the study, we can conclude that the use of antibacterial photodynamic therapy led to a decrease in the number of cases that are accompanied by pain after the treatment of chronic periodontitis in one visit, in comparison with the data in patients who used the calcium-containing drug Calasept. The use of laser radiation during the preparation of the root canal for obturation in the treatment of chronic forms of periodontitis made it possible to reduce the number of complications by almost 1.5 times and increase the healing process of the rarefaction focus. The use of laser radiation during endodontic treatment reduces the number of appointments and allows you to complete the treatment in one visit.

Discussion

Apical periodontitis is the result of a complex interaction between microbial factors and host defense mechanisms. The landscape and role of root canal microbes in the development of apical periodontitis is now well known. treatment of apical periodontitis is to eliminate root canal infection and avoid further re-infection of the canal.[31,32]

Currently, a variety of materials have been proposed in endodontics.

In the field of dentistry, laser photodynamic therapy is used as an additional antimicrobial strategy to mechanical preparation during endodontic and periodontal treatment. In recent years, in vitro and in vivo studies have shown positive results with respect to antimicrobial photodynamic therapy in endodontics caused by bacteria present as biofilms.[33]

Thermodynamic therapy is a non-invasive method that combines laser energy with a photosensitizer to produce singlet oxygen molecules and free radicals to destroy target cells[34]. Photodynamic therapy has the advantage of reducing the treatment time and the need for anesthesia, causing the destruction of bacteria in a very short period of time, without the development of resistance from the target bacteria and damage to adjacent host tissues.[35-38]

This type of therapy is a technique based on the combination of a non-toxic photosensitizer (PS) and visible light of the appropriate wavelength, which is activated in the presence of oxygen to form reactive oxygen species (ROS). ROS cause a series of photochemical and biological events that cause irreversible damage leading to the death of microorganisms.

Oliveira and colleagues evaluated the in vitro antimicrobial effect of photodynamic therapy using MB (50 μM) and low power laser (660 nm, 100 mW and 9 J) against C. albicans, P. aeruginosa, E. faecalis and S. golden.[39] Laser radiation in the presence of MB eliminated 74.90% for C. albicans, 72.41% for P. aeruginosa, 96.44 and 95.42% for E. faecalis and S. aureus, respectively, and showed statistically significant differences between different groups ($p<0.001$). The results show that aPDT effectively reduces the number of viable cells of the studied microorganisms, especially E. faecalis and S. aureus.

Given the potential of laser photodynamic therapy in killing microbial organisms and its rapid and daily development in recent years, this study analyzing the effectiveness of using a laser photodynamic system for the treatment of chronic apical periodontitis. The results of the treatment showed a positive effect and we observed that laser photodynamic therapy with is a valuable treatment optionchronic apical periodontitis. In general, based on the available data, it can be considered a laser photodynamic therapy safe method

to complement conventional therapy for the treatment of periodontal disease and elimination of periodontal pathogens.

Conclusion

The use of laser radiation in preparing the root canal for obturation in the treatment of chronic forms of periodontitis made it possible to reduce the number of complications by almost 1.5 times and accelerate the healing process of the rarefaction focus.

Declarations

Conflict of interest and financial disclosure

The author declares that he has no conflict of interest and there was no external source of funding for the present study. None of the authors have any relevant financial relationship(s) with a commercial interest.

Ethical approval

Research protocol was approved by the local Ethical Committee (2018/23) and in accordance with those of the World Medical Association and the Helsinki Declaration.

Informed consent

Informed consent was obtained from all individual participants included in the study.

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Non funding.

REFERENCES

1. Meirinhos J, Martins JNR, Pereira B, et al. Prevalence of apical periodontitis and its association with previous root canal treatment, root canal filling length and type of coronal restoration - a cross-sectional study. *Int Endod J.* 2020;53(4):573-584. doi:10.1111/iej.13256
2. Niazi SA, Bakhsh A. Association between Endodontic Infection, Its Treatment and Systemic Health: A Narrative Review. *Medicina (Kaunas).* 2022;58(7):931. doi:10.3390/medicina58070931
3. Karakov KG, Porfiriadis MP, Khachaturyan EE, et al. Experience of clinical application of antibacterial photodynamic system in endodontics. *Bulletin of the Medical Dental Institute.* 2015;4 (35):15-18
4. Savelyev PA, Ivensky VN, Karakov KG. Increasing the efficiency of the treatment of inflammatory diseases of the periodontal by the "closed" method. In the collection: new in the theory and practice of dentistry. *Materials of the XX Forum of the scientific-practical conference of dentists of the South of Russia "TOPICAL ISSUES OF CLINICAL DENTISTRY", dedicated to the 80th anniversary of the birth of Professor AI Volozhin.* 2021:53-57
5. Lee LW, Lee YL, Hsiao SH, Lin HP. Bacteria in the apical root canals of teeth with apical periodontitis. *J Formos Med Assoc.* 2017;116(6):448-456. doi:10.1016/j.jfma.2016.08.010
6. Siqueira JFJ, Rôças IN, Alves FR, Silva MG. Bacteria in the apical root canal of teeth with primary apical periodontitis. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2009;107(5):721-6. doi:10.1016/j.tripleo.2009.01.042
7. Wong J, Manoil D, Näsman P, Belibasakis GN, Neelakantan P. Microbiological Aspects of Root Canal Infections and Disinfection Strategies: An Update Review on the Current Knowledge and Challenges. *Front Oral Health.* 2021;25(2):672887. doi:10.3389/froh.2021.672887

8. Iqbal A. Antimicrobial irrigants in the endodontic therapy. *Int J Health Sci (Qassim).* 2012;6(2):186-92

9. Usta SN, Solana C, Ruiz-Linares M. *et al.* Effectiveness of conservative instrumentation in root canal disinfection. *Clin Oral Invest*. 2023. doi:10.1007/s00784-023-04929-z

10. Li Q, Zhang Q, Zou X. *et al.* Evaluation of four final irrigation protocols for cleaning root canal walls. *Int J Oral Sci.* 2020;12:29. doi:10.1038/s41368-020-00091-4

11. Karakov KG, Vlasova TN, Oganyan AV, Khachaturyan AE, Akopova VV. Modern technologies in endodontics in the treatment of chronic apical periodontitis. *Scientific news.* 2022;29:89-92

12. Calişkan MK, Sen BH. Endodontic treatment of teeth with apical periodontitis using calcium hydroxide: a long-term study. *Endod Dent Traumatol.* 1996;12(5):215-21. doi:10.1111/j.1600-9657.1996.tb00518.x

13. Jia L, Zhang X, Shi H, Li T, Lv B, Xie M. The Clinical Effectiveness of Calcium Hydroxide in Root Canal Disinfection of Primary Teeth: A Meta-Analysis. *Med Sci Monit.* 2019;20(25):2908-2916. doi:10.12659/MSM.913256

14. Vera J, Siqueira JFJ, Ricucci D, et al. One- versus two-visit endodontic treatment of teeth with apical periodontitis: a histobacteriologic study. *J Endod.* 2012;38(8):1040-52. doi:10.1016/j.joen

15. Tsarev VN, Mitronin AV, Podporin MS. Combined endodontic treatment: microbiological aspects by using scanning electronical microscopy. *Endodontics Today.* 2021;19(1):11-17. doi:10.36377/1683-2981-2021-19-1-11-17

16. Tariq M, Iqbal Z, Ali J, et al. Treatment modalities and evaluation models for periodontitis. *Int J Pharm Investig.* 2012;2(3):106-22. doi:10.4103/2230-973X.104394

17. Pyo J, Lee M, Ock M, Lee J. Quality of Life and Health in Patients with Chronic Periodontitis: A Qualitative Study. *Int J Environ Res Public Health.* 2020;17(13):4895. doi:10.3390/ijerph17134895

18. Funk B, Kirmayer D, Sahar-Heft S, Gati I, Friedman M, Steinberg D. Efficacy and potential use of novel sustained release fillers as intracanal medicaments against Enterococcus faecalis biofilm in vitro. *BMC Oral Health.* 2019;19(1):190. doi:10.1186/s12903-019-0879-1

19. Cope AL, Francis N, Wood F, Chestnutt IG. Systemic antibiotics for symptomatic apical periodontitis and acute apical abscess in adults. *Cochrane Database of Systematic Reviews*. 2018;9. doi:10.1002/14651858.CD010136

20. Huang Q, Li Z, Lyu P, Zhou X, Fan Y. Current Applications and Future Directions of Lasers in Endodontics: A Narrative Review. *Bioengineering (Basel).* 2023;10(3):296. doi:10.3390/bioengineering10030296

21. Anagnostaki E, Mylona V, Parker S, Lynch E, Grootveld M. Systematic Review on the Role of Lasers in Endodontic Therapy: Valuable Adjunct Treatment? *Dent J (Basel).* 2020 ;8(3):63. doi:10.3390/dj8030063

22. Plotino G, Grande NM, Mercade M. Photodynamic therapy in endodontics. *International Endodontic Journal*. 2019;52:760–774. doi:10.1111/iej.13057

23. Khachaturyan AE, Karakov KG, Khachaturyan EE, Solovieva OA, Vlasova TN, Oganyan AV. Use of decametoxine and photodynamic therapy for irrigation of root canals in the treatment of apical periodontitis. *Bulletin of a young scientist.* 2022;11(3):85-90

24. Karakov KG, Khachaturyan EE, Uzdenov MB, et al. Modern view on antibacterial treatment of the root canal using laser photodynamic therapy. *Problems of dentistry.* 2019;15(1):23-27

25. Alfimova OA, Mordasov NA, Kasimova GV, et al. Use of the diode laser in endodontics. In the collection: New in the theory and practice of dentistry. *Materials of the XXII Forum within the*

framework of the scientific and practical conference of dentists of the South of Russia "STOMATOLOGY OF THE XXI CENTURY", dedicated to the 85th anniversary of the Stavropol State Medical University and the 65th anniversary of the Faculty of Dentistry. 2023:13-14

26. Blashkova SL, Krikun EV, Karakov KG, et al. Influence of the diode laser on the dynamics of clinical indicators in patients with endo-periodontal lesions. *Medical Bulletin of the North Caucasus.* 2020;15(1):125-126. doi:10.14300/mnnc.2020.15031

27. Bärenfaller V, Clausen C, Sculean A, Eick S. Effect of photoactivated disinfection using light in the blue spectrum. *J Photochem Photobiol B.* 2016;158:252-257. doi:10.1016/j.jphotobiol.2016.03.006

28. Schneider M, Kirfel G, Berthold M, Frentzen M, Krause F, Braun A. The impact of antimicrobial photodynamic therapy in an artificial biofilm model. *Lasers Med Sci.* 2012;27(3):615-20. doi:10.1007/s10103-011-0998-7

29. Tenore G, Palaia G. Migliau G, et al. Evaluation of Photodynamic Therapy Using a Diode Laser 635 nm as an Adjunct to Conventional Chemo-Mechanical Endodontic Procedures against Enterococcus faecalis Biofilm: Ex-Vivo Study. *Appl. Sci.* 2020;10:2925. doi:10.3390/app10082925

30. Carrera ET, Dias HB, Corbi SCT, et al. The application of antimicrobial photodynamic therapy (aPDT) in dentistry: a critical review. *Laser Phys.* 2016;26(12):123001. doi: 10.1088/1054-660X/26/12/123001

31. Bawazir, OA; Salama, FS. Clinical evaluation of root canal obturation methods in primary teeth. *Pediatr Dent.* 2006;28:39-47. PMID:16615374

32. Siqueira JF Jr, Favieri A, Gahyva SM, Moraes SR, Lima KC, Lopes HP. Antimicrobial activity and flow rate of newer and established root canal sealers. *J Endod.* 2000;26(5):274-7. doi:10.1097/00004770-200005000-00005

33. Meimandi M, Talebi Ardakani MR, Esmaeil Nejad A, et al. The Effect of Photodynamic Therapy in the Treatment of Chronic Periodontitis: A Review of Literature. *J Lasers Med Sci.* 2017;8(1):7-11. doi:10.15171/jlms.2017.s2

34. Konopka K, Goslinski T. Photodynamic therapy in dentistry. *J Dent Res.* 2007;86(8):694-707. doi:10.1177/154405910708600803

35. Soukos NS, Mulholland SE, Socransky SS, Doukas AG. Photodestruction of human dental plaque bacteria: enhancement of the photodynamic effect by photomechanical waves in an oral biofilm model. *Lasers Surg Med.* 2003;33(3):161-8. doi:10.1002/lsm.10208

36. Vohra F, Akram Z, Safii SH, et al. Role of antimicrobial photodynamic therapy in the treatment of aggressive periodontitis: A systematic review. *Photodiagnosis Photodyn Ther*. 2016;13:139-147. doi:10.1016/j.pdpdt.2015.06.010

37. Akram Z, Al-Shareef SA, Daood U, et al. Bactericidal Efficacy of Photodynamic Therapy Against Periodontal Pathogens in Periodontal Disease: A Systematic Review. *Photomed Laser Surg*. 2016;34(4):137-49. doi:10.1089/pho.2015.4076

38. Annaji S, Sarkar I, Rajan P, et al. Efficacy of Photodynamic Therapy and Lasers as an Adjunct to Scaling and Root Planing in the Treatment of Aggressive Periodontitis - A Clinical and Microbiologic Short-Term Study. *J Clin Diagn Res.* 2016;10(2):08-12. doi: 10.7860/JCDR/2016/13844.7165

39. Oliveira BPD, Lins CCDSA, Diniz FA, Melo LL, Castro CMMBD. In vitro antimicrobial photoinactivation with methylene blue in different microorganisms. *Braz J Oral Sci.* 2014;13:53–7

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Կարեն Կարակով,[1] Էմիլիա Խաչատուրյան,[2] Ռազիմա Ուզդենովա,[3] Արաքսյա Խաչատուրյան[4]

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[4] ՌԴ Առողջապահության նախարարության Ստավրոպոլի պետական բժշկական համալսարանի թերապևտիկ ստոմատոլոգիայի ամբիոնի ասիստենտ, Ստավրոպոլ, ՌԴ

Ամփոփում

Նպատակ. Ուսումնասիրել Խրոնիկ գագաթային պարօդոնտիտի բուժման համար լազերային ֆոտոդինամիկ համակարգի օգտագործման արդյունավետությունը:

Նյութեր եւ մեթոդներ. Հետազոտությանը մասնակցել է 18-ից 60 տարեկան 66 հիվանդ՝ քրոնիկ գագաթային պերոդոնտիտ ախտորոշմամբ, որոնց մոտ բուժվել է 90 արմատային խողովակ: Ախտորոշումը հաստատվել է հիվանդի գանգատների, կլինիկական և գործիքային հետազոտությունների, ռենտգենյան տվյալների հիման վրա:

Հիվանդները հավասարապես բաժանվել են երկու խմբի և ենթարկվել էնդոդոնտիկ բուժման: Առաջին խմբի հիվանդների արմատային խողովակներում ախտահանումն իրականացվել է ֆոտոդինամիկ թերապիայի մեթոդով: Այնուհետև արմատային խողովակները լցվել են գուտապերչով և հերմետիկով, ատամը վերականգնվել է: 2-րդ խմբի հիվանդների մոտ գործիքային և դեղորայքային բուժումից հետո արմատախողովակները լցվել են կալցիումի հիդրօքսիդի հիման վրա «Կալասեպտ» (Շվեդիա) ժամանակավոր նյութով, իսկ ատամը վերականգնվել է ժամանակավոր ապակ-իոնոմեր ցեմենտով «Vitremer» (3M ESPE):

Արդյունքները. Բուժման արդյունքների գնահատումն իրականացվել է արմատախողովակների վերջնական լցումից հետո 1-14 օր, 6 և 12 ամիս հետո: կարճ ժամանակում դրական դինամիկա է նկատվել հիվանդների 93,9%-ի մոտ: դեպքեր 1-ին խմբի հիվանդների մոտ և 72,7%՝ 2-րդ խմբի հիվանդների մոտ: 1-ին խմբի հիվանդների մոտ բարդություններ են առաջացել դեպքերի 6,1%-ում: 2-րդ խմբում 27,3% դեպքերում, ինչը գրեթե 4,5 անգամ ավելի է, քան 1-ին խմբում: 6 ամսից հետո բուժման 2 մեթոդները համեմատելիս 1-ին խմբի հիվանդների մոտ նկատվել է կլինիկական բարեկեցություն՝ 96,9%, իսկ 2-րդ խմբի՝ 81,8% դեպքերում: 1-ին խմբի հիվանդների մոտ առաջացած բարդությունների տոկոսը կազմել է 3,1%, իսկ 2-րդ խմբի հիվանդների մոտ՝ 18,2%:

Ոսկրային հյուսվածքի ֆոկուսի ամբողջական բուժումը նկատվել է 1-ին խմբի հիվանդների 84,8%-ում, իսկ 2-րդ խմբի հիվանդների մոտ՝ 66,6%-ի դեպքում: Ոսկրային հյուսվածքի ֆոկուսի մասնակի ապաքինում նկատվել է 1-ին և 2-րդ խմբերի 18,1% և 15,1% դեպքերում:

Եզրակացություն. Լազերային ճառագայթման օգտագործումը պերիոդոնտիտի քրոնիկական ձևերի բուժման մեջ արմատախողովակի լցման ժամանակ հնարավորություն է տվել նվազեցնել բարդությունների թիվը գրեթե 1,5 անգամ և արագացնել նոսրացման ֆոկուսի բուժման գործընթացը:

АНАЛИЗ ЭФФЕКТИВНОСТИ ПРИМЕНЕНИЯ ЛАЗЕРНОЙ ФОТОДИНАМИЧЕСКОЙ СИСТЕМЫ ДЛЯ ЛЕЧЕНИЯ ХРОНИЧЕСКОГО АПИКАЛЬНОГО ПЕРИОДОНТИТА. СЕРИЯ КЛИНИЧЕСКИХ СЛУЧАЕВ

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Абстракт

Цель исследования анализ эффективности применения лазерной фотодинамической системы для лечения хронического апикального периодонтита.

Материалы и методы: В исследование включено 66 пациентов в возрасте от 18 до 60 лет с диагнозом «хронический апикальный периодонтит», у которых пролечено 90 корневых каналов. Диагноз устанавливали на основании жалоб больного, клинических и инструментальных исследований, рентгенологических данных.

Пациенты были разделены поровну на две группы и прошли эндодонтическое лечение. В корневых каналах пациентов первой группы проводилась дезинфекция методом фотодинамической терапии. Затем канал обтурирован гуттаперчевыми штифтами и силером, зуб восстановлен. У пациентов 2-й группы после инструментального и медикаментозного лечения корневые каналы запломбированы временным материалом «Каласепт» (Швеция) на основе гидроксида кальция, а зуб восстановлен временным стеклоиономерным цементом «Витремер» (3M ESPE).

Результаты: Оценку результатов лечения проводили в сроки 1-14 дней, 6 и 12 месяцев после окончательного пломбирования корневых каналов. положительная динамика в короткие сроки отмечена у 93,9% больных. случаев у больных 1-й группы и в 72,7% у больных 2-й группы. Осложнения возникли у больных 1-й группы в 6,1% случаев. Во 2-й группе в 27,3% случаев, что почти в 4,5 раза больше, чем в 1-й группе. При сравнении 2-х методов лечения через 6 месяцев клиническое благополучие наблюдалось у больных 1-й группы в 96,9% и во 2-й группе в 81,8% случаев. Процент возникших осложнений составил 3,1% у больных 1-й группы и 18,2% - во 2-й группе.

Полное заживление очага в костной ткани наблюдалось в 84,8% случаев у больных 1-й группы и в 66,6% случаев у больных 2-й группы. Частичное заживление очага костной ткани наблюдалось в 18,1% и 15,1% случаев в 1-й и 2-й группах.

Заключение: Применение лазерного излучения при подготовке корневого канала к обтурации при лечении хронических форм пародонтита позволило почти в 1,5 раза снизить количество осложнений и ускорить процесс заживления очага разрежения.

Karakov K, Khachatryan E, Uzdenova R, Khachatryan A. Analysis of the effectiveness of using a laser photodynamic system for the treatment of chronic apical periodontitis. Clinical cases series. *Bulletin of Stomatology and Maxillofacial Surgery*. 2023;19(3):28-36. doi: 10.58240/1829006X-2023.19.3-28