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THE EFFECTIVENESS OF THE COMBINED APEX – FORESIS METHOD WITH THE COMBINED APPLICATION OF THE METHOD OF FLUCTUATION IN THE COMPLEX TREATMENT OF GRANULOMATOUS AND GRANULATING FORMS OF CHRONIC APICAL PERIODONTITIS

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Abstract: As the results of microbiological studies have shown, in the material taken before the start of various types of treatment from the root canals of teeth, a variety of microbial landscape in the form of obligate and facultative anaerobic bacteria was revealed.

Keywords: Streptococci and staphylococci were most often found in the studied material: Str.sanguis – in 52% of patients, Str.mutans – in 68%, Str.salivarius – in 52%, St.epidermidis – in 41%. In addition, 38% of patients had Peptostreptococcus anaerobius in their root canals, 12% had Clostridium spp, and 14% had Candida albicans fungi. There is no pattern of bone beams in the rarefaction area.

Introduction

The study of strains of anaerobic bacteria obtained from the root canals of teeth before treatment showed (Table 3.1) that with traditional therapy of granulomatous and granulating forms of chronic apical periodontitis, all strains of facultative anaerobic bacteria had growth retardation zones of less than 5.1 (3.7-5.0 mm). When depophoresis with copper-calcium hydroxide at a current strength of 1.5 mA x min – 4.9 (3.5-4.8 mm). In accordance with the existing criteria for assessing antibacterial activity, such values of inhibition of the growth of test cultures can be regarded as a weak antibacterial effect of traditional treatment and depoforesis at a dose of 1.5 mA x min.

moderately pronounced antibacterial effect (growth retardation zones – 6.8-9.3 mm). The most pronounced antibacterial effect appeared in cases when the dose of depoforesis was 5 mA x min. The diameter of the colony growth delay zones of all the bacteria studied was more than 15.1 mm (15.1-21.8 mm). Therefore, the optimal doses of depophoresis that have an antibacterial effect are 2.5-5 mA x min [1.3.5.7.9.11.13.15.17.19].

In the treatment of granulomatous and granulating forms of chronic apical periodontitis with apex-foresis using a silver-copper electrode, the growth retardation zones of all strains of facultative anaerobic bacteria studied were 5.1 mm (3.9-5.0 mm), at a dose of 1.5 mA x min, which is regarded as a weak antibacterial effect of this dose of apex-foresis.

While the current increases during the procedure to 2.5 mA x min, the diameter of the growth retardation zones is 8.6-9.6 mm, which corresponds to a moderately pronounced antibacterial effect. The most pronounced antibacterial effect was detected at a dose of apex-foresis of 5 mA x

min, that is, the diameter of the zones of growth delays of colonies of the studied bacteria was more than 15.4 mm (15.4-22.4 mm).

Thus, the optimal doses of apex-forez, which have an antibacterial effect, are also 2.5-5 mA x min.

In the combined endodontic treatment of granulomatous and granulating forms of chronic apical periodontitis with the use of apex - foresis and the method of fluoridation, even more pronounced antibacterial effects are observed than using them separately. Thus, the diameter of the growth retardation zones of the strains of the studied anaerobic bacteria with the combined use of apex – foresis and the method of fluoridation is on average equal to 20.4 mm (17.8-24.5 mm), which has 4.8 times more antibacterial effect than traditional treatment. This is respectively 4.2 mm, 1.6 times more than depoforez (respectively 12.8 mm) and 1.5 times more than apex-forez (respectively 13.2 mm).

Thus, the combined endodontic treatment of granulomatous and granulating forms of chronic apical periodontitis with the use of apex-foresis of a silver-copper electrode with the combination of the method of fluoridation has the most pronounced antibacterial effect than the use of these methods of treatment separately.

It should be noted that the detection of only one form of bacteria in the root canals of teeth was detected only in 6 (7.4%) persons with chronic granulating periodontitis out of 81 examined, in most cases (92.6%) associations of pathogens were observed, including from 2 to 6 types of microbes. For example, the largest range of microflora was isolated from the material obtained from patients with chronic granulating periodontitis, and monoinfection was not found at all in patients with chronic granulomatous periodontitis. In all forms of the disease, Streptococcus and Candida fungi were present in patients before treatment, with streptococcal microflora dominating the associations [2.4.6.8.10.12.14.16.18].

The normality of the distribution of indicators in each of the compared groups was assessed using the Shapiro-Wilk criterion (at $n<50$). To compare indicators whose distribution differs from normal St.epidermidis ($p =0.017$), Clostridium spp. ($p = 0.029$), the nonparametric Kraskel-Wallis criterion was used. The statistical significance of the differences in indicators was assessed by comparing the calculated value of the Kraskel-Wallis criterion with the critical ones, determining the significance level p using the statistical program SPSS.

When identifying differences between the compared groups before treatment using the Kraskel-Wallis criterion, the differences were insignificant St.epidermidis ($p = 0.981$), Str.sanguis ($p = 0.097$), Str.mutans ($p = 0.752$), Str.salivarius ($p = 0.702$), Peptostreptococcus anairobius ($p = 0.724$), Clostridium spp. ($p = 0.752$), Candida albicans ($p = 0.507$). Data on the quantitative and qualitative composition of the microflora of the root canals of teeth before therapy with various types of endodontic effects are given.

When comparing the data on the quantitative and qualitative composition of the microflora of the root canals of teeth after therapy with various types of endodontic exposure, a significant decrease in the amount of microflora was noted, depending on the type of treatment used. In patients with granulomatous and granulating forms of chronic apical periodontitis who received traditional treatment, the contamination of the root canal, although tends to decrease, but in most cases it has no significant differences ($P>0.05$).

When applying root canal depoforesis with copper-calcium hydroxide after a course of treatment, the amount of microflora decreased from 7.6-9.8 Lg KOE/ml to 2.8-6.3 Lg KOE/ml, that is,

almost 2 times. At the same time, complete decontamination (there was no growth of microbes) was observed in 57.8% of cases, in the rest - the contamination significantly (P<0.05-0.01) decreased.

Endodontic dental treatment with apex-foresis using a silver-copper conductor led to a significant (P<0.05-0.01) 3.3% decrease in all types of microflora from 7.5-12.1 Lg KOE/ml to 1.9-4.1 Lg KOE/ml, especially this is clearly seen in relation to Str.sanguis, Str.mutans, Str.salivarius and Clostridium spp. (Figure 3.3). Complete decontamination was observed in 66.8% of patients. In other words, the treatment of chronic apical periodontitis with the use of apex-foresis has 1.3 times more antibacterial effect than root canal depoforesis. Thus, the data obtained confirmed the antibacterial efficacy of the method of treatment of apex-foresis of silver-copper conductor with a combination of the method of fluoridation in relation to facultative anaerobic microbes, both the most common in periodontitis and those with significant resistance to antimicrobial effects. At the same time, the most pronounced (1.5-2.5 times more) the combined use of apex – foresis and the method of fluoridation has an antibacterial effect, rather than using them separately.

When identifying differences between the compared groups after treatment using the Kraskel-Wallis criterion, the differences were significant St.epidermidis (p = 0.000), Str.sanguis (p = 0.000), Str.mutans (p = 0.000), Str.salivarius (p = 0.000), Peptostreptococcus anairobius (p = 0.000), Clostridium spp. (p = 0.000), Candida albicans (p = 0.000).

Conclusions.

Actinobacillus actinomycetemcomitans, Prevotella intermedia, Bacteroides forsythus, Treponema denticola and Porphyromonas gingivalis, the multiplex PCR method was used, which allows simultaneous identification of several pathogens. PCR was performed in an amplifier of the Tertsik MS-2 brand (manufacturer – DNA Technology, Moscow). The reaction proceeded in the Matrix temperature control mode according to the following program: denaturation at 95 ° C for 120 s (1 cycle); denaturation at 95 °C for 30 s; annealing at 60 ° C for 30 s; synthesis at 72 oC for 40 s (33 cycles); synthesis at the final stage at 72 oC for 240 s (1 cycle). The incubation mixture with a final volume of 25 ml contained 19 ml of supermix, 1 unit/ml of polymerase, 5 ml of DNA isolated from the root canals of teeth. To prevent evaporation of the reaction sample, 25 ml of mineral oil was layered on top of the mixture. The obtained DNA products were determined by electrophoresis in 1.6% agarose gel.

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