REVIEW

from

Prof. Dr. Stefan Vasilev Peev, DMD,PhD,DSc

Professor of Dental Implantology, Department of Periodontology and Dental Implantology, Faculty of Dental Medicine, Medical University - Varna.

on
dissertation on the topic:

"Laser-assisted therapy of periimplantitis by Er:YAG laser"

for acquiring an PhD, under the scientific program "Periodontology and Diseases of Oral Mucosa" in professional field 7.2. Dental medicine, field of higher education; 7. Healthcare and sports.

by
Ivan Venkov Nachkov

Topic of the dissertation

With the widespread use of dental implantology in dental implantology, the observed late complications, including biological complications, including periimplantitis, are becoming more frequent in dental practice. This gives rise to an active research for new and effective methods of treatment. I believe that the topic of the dissertation is relevant and significant.

Literature review

The literature review is presented on 57 of a total of 195 pages of the dissertation. It is based on a literature reference from 326 sources. Six of them have been published in the last five years.

Aim and tasks

The aim of the dissertation is to study Er: YAG laser-assisted therapy of periimplantitis by experimental, laboratory and clinical methods.
In the implementation of the formulated goal the following tasks are set:

1. To conduct a scanning electron microscopic examination and comparative analysis of structural changes on the titanium surface after treatment with Er: YAG and diode lasers.
2. To study the changes in temperature in and around the implant during laser irradiation with Er: YAG, CO2 and diode lasers. This task is divided into two subtasks.
2.1. Subtask. Investigation of real-time temperature changes using an infrared thermal camera.
2.2. Subtask. The research is performed with the help of an interface integrated digital system with thermocouples.
3. The task. Investigation of the decontamination ability of Er: YAG laser on periodontopathogenic microorganisms.
3.1. Subtask. Determination of the main periodontal pathogens from the peri-implant pocket of patients by Real time PCR reaction.
3.2. Subtask. Investigation of the decontamination efficiency of Er: YAG laser and ultrasonic device with Teflon tip, verified by electron microscope.
4. Study of the clinical efficacy of Er: YAG laser in laser-assisted therapy of periimplantitis.

The aim corresponds to the topic of the dissertation and is in logical connection with the set tasks for its achievement.

Critical note: in subtask 3.2, a Teflon tip is inadmissibly used for the treatment of an implant surface with a modified topography, which logically leads, instead of decontamination of the surface to its contamination with a material from the tip. This is evident from the results obtained, which have been misinterpreted.
The design of the rest of the research is adequate to the set tasks.

Results and discussion.

The results are properly documented and statistically processed.
There is no adequate discussion of the obtained results. The presented one repeats or complements the literature review.

Conclusions

A total of 15 conclusions were made on the four tasks. At the end of the dissertation 12 conclusions are presented.

Contributions

Six contributions to the dissertation have been identified:

1. For the first time in our country an electron microscopic examination of implant surfaces treated with Er: YAG laser was performed.

2. The reflection coefficient from the titanium surface was precisely determined during the laser treatment.

3. For the first time, the temperature changes in the operative field of a thermostated biological model were observed, which most closely resembles the physiological conditions in the oral cavity.

4. For the first time, temperature changes were recorded in real time by irradiation through a thermal camera.

5. The bactericidal potential of an Er: YAG laser detected by a scanning electron microscope was examined for the first time.

6. Based on the results of laboratory and clinical studies, a surgical protocol for Er: YAG laser-assisted therapy of periimplantitis has been proposed.

Conclusion:

The presented dissertation meets the minimum requirements for awarding a PhD. As a reviewer, I recommend to the respected members of the scientific jury to vote for the award of educational and scientific degree "Doctor" in the scientific program "Periodontology and Diseases of Oral Mucosa" in professional field 7.2. Dental medicine, field of higher education; 7. Healthcare and sports. of Ivan Venkov Nachkov.

Reviewer: .....

Prof. Dr. Stefan Vasilev Peev, DMD, PhD, DSc

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