

To the

The Chairman of the Scientific jury,

determined by Order No. R-3384/21.11.2023

of the Rector of the Medical University - Plovdiv

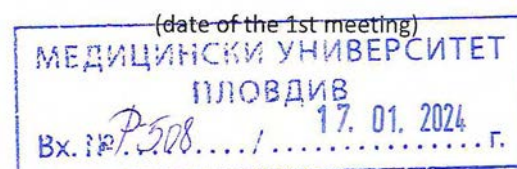
15A V. Aprilov Blvd

4002 Plovdiv

On your Protocol No. 1/ dated 04.12.2023.

OPINION

by



Associate Professor Dr. Sevda Mihailova Yantcheva, PhD

Head of the Department of "Conservative Dentistry", FDM, MU-Sofia

Scientific speciality: Therapeutic Dental Medicine

as an external member of the Scientific Jury

of a dissertation on:

"Effect of preparation of hard dental tissues with Er: YAG laser on the adhesive layer"

for awarding the scientific and educational degree "doctor."

in the doctoral program "Therapeutic Dental Medicine" in a professional direction

7.2. Dental Medicine from the field of higher education 7. Health care and Sports

Author: Dr. Nikolay Maksimov Simeonov

Form of doctoral studies: independent preparation

Department: "Operative dentistry and endodontics", FDM, MU-Plovdiv

Scientific supervisor: Prof. Dr Ivan Filipov, PhD,

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Заличено на основание
Чл.5 §1, 6. "В" Регламент (ЕС)2016/679

In the last 20 years, very intensive work has been done to improve and simplify the adhesive protocol related to the application of dental composite materials. Self-etchers containing the functional monomer 10-MDP stand out as the main alternative to three-step adhesive systems. Its structure allows a polar behaviour favoring adhesion and providing protection to collagen fibers through the formation of MDP-calcium salts.

Laser preparation is a modern technology that is used in the field of dentistry as an effective selective method for removing carious dentin. Laser preparation does not lead to the formation of a contaminant layer but, at the same time, causes chemical and morphological changes in enamel and dentin.

In this regard, the dissertation work on the topic "Influence of the preparation of hard dental tissues with an Er: YAG laser on the adhesive layer" realized by Dr. Nikolay Simeonov, under the scientific guidance of Prof. Dr. Ivan Filipov, PhD, is current and timely.

PRESENTATION OF THE DOCTORAL CANDIDATE

The presented set of materials in paper format is based on the requirements of the ZRASRB, the regulations for implementing the ZRASRB, and the terms and conditions for acquiring scientific degrees and occupying academic positions at the MU-Plovdiv.

Dr. Nikolay Simeonov was born on May 3, 1991. He completed his secondary education in 2010. in the Model Mathematical High School, Acad. Kiril Popov". In 2018, he graduated with a Master of Dental Medicine from FDM, MU - Plovdiv. Since December 2018, he has been an assistant in the Department of "Operative Dentistry and Endodontics" at FDM, MU - Plovdiv. There, he is involved in conducting exercises, seminars and tests for students of Dental Medicine; Dr. Simeonov is the course supervisor for the 2021-2027 graduating class. He took part in preparing three teaching aids for the discipline "Operative dentistry and endodontics".

Dr. Nikolay Simeonov is a final year specialist in "Operative dentistry and endodontics". He speaks German and English.

He participated in the Erasmus+ exchange in 2012. in France and 2023. in Poland while simultaneously becoming involved in teaching students in the same program at FDM-Plovdiv. There is a completed project in 2021. under the program "Doctoral and Postdoctoral Projects", he participated in two projects under the National program "Young Scientists and Postdoctoral Students" in 2020 and 2021.

Dr. Nikolay Simeonov is the author of 4 full-text publications, one of which is in a refereed journal. He participated in posters and oral presentations in 1 national and 4 international scientific forums.

My thesis submitted for opinion contains 165 standard pages and is very well illustrated with 18 tables and 49 figures. The bibliography contains 192 sources, of which 10 are Cyrillic, and 182 are Latin.

The title page, table of contents and abbreviations are correctly arranged.

INTRODUCTION

In the introduction, the modern trends in operative dentistry development are clearly and concretely indicated. These are the introduction of laser preparation and adhesive systems containing functional monomers to establish a chemical connection with the dentine structure and build a full-fledged adhesive layer. The unanswered scientific questions regarding dentin changes caused by Er: YAG laser preparation and their influence on the interaction with the adhesive systems and the adhesive layer formation are brought out. Preparation with the Er: YAG laser leads to increased acid resistance, there is no smear layer, and the adhesive systems reach directly to the tooth surface, but whether this condition contributes to the improvement of the bond with the dentinal structure is not completely clear. The problems raised argue for the need to develop the current dissertation by conducting experimental and clinical studies to evaluate and analyze the preparation with Er: YAG laser and subsequent use of self-etching adhesive systems containing 10-MDP.

LITERATURE REVIEW

The literature review that is written on 30 pages. It introduces the problems related to the adhesive bond between dentin and the main generations of adhesive systems. It brings out the advantages and features of the functional monomer 10-MDP as a component of self-etching adhesives. It examines the morphological changes of laser preparation on dentin and the dentinal wound, raising unexplored issues of adhesive bond qualities in laser-treated tissues. Dr. Simeonov dwells on the clinical possibilities for improving the qualities of adhesive bonding, including laser ablation. The main research methods for evaluating the qualities of the adhesive bond are presented. Emphasis is placed on using a confocal laser scanning microscope and energy dispersive spectroscopy, high-tech modern methods that Dr. Simeonov subsequently used in his development. The review concludes with a summary and statement of the unresolved issues regarding the laser preparation of dental hard tissues and the formation of an adhesive layer after applying an adhesive system containing 10-MDP.

GOAL AND OBJECTIVES

The goal is clearly formulated, and five tasks have been selected.

A questionnaire survey, two laboratory studies and a clinical study are included, which contribute to the logical derivation of clinical recommendations for optimizing the application of the Er: YAG laser in the preparation of hard dental tissues according to task 5.

MATERIAL AND METHODS

The material and methods are correctly described and reproducible.

The survey has sufficient respondents (179 dentists) to draw objective conclusions. High-tech equipment was selected to implement the in vitro studies according to tasks 2 and 3. An adequate number of samples were included: 45 cavities with an applied adhesive system according to task 2 and dentin surfaces of 10 teeth prepared with an Er: YAG laser and an applied adhesive system according to task 3. 270 measurements according to task 2 and 200 fields of observation according to task 3 were analyzed, which guarantees the objectivity of the results and conclusions. According to task 4, observations were made on 30 patients with clearly formulated criteria for selecting the cases and evaluating the results.

RESULTS AND DISCUSSION

The results of the completed tasks are presented concisely, and clearly. Appropriate statistical methods were selected for the analysis of the obtained data. All scientific work is illustrated well with tables, diagrams and photographic material. I am impressed by the microscanograms showing the penetration of the primer and the bond in the direction of the dentin and also by the detailed elemental analysis of the dentin and adhesive layer during preparation with the Er: YAG laser using an energy dispersive spectrometer.

The discussion of the results is comprehensive and logical. The authors compared the available data from the scientific literature and based on their research.

CONCLUSIONS

The dissertation reaches up to 8 conclusions, made as a result of implementing the set tasks. They are formulated objectively, without undue favouritism of laser preparation.

CONTRIBUTIONS

Four contributions of an original nature and 3 of a corroborating nature have been formulated, which I fully accept.

The dissertation has an original contribution due to the measurements of the length of the resin tags in the dentinal tubules with CLSM for the first time in our country after preparation with an Er: YAG laser and an applied adhesive system with 10-MDP, as well as the calculated prognostic length of the resin tags. An original contribution is the elemental analysis performed on the dentin surface after Er: YAG laser preparation. An original contribution is the clinical study on class I composite restorations after preparation with the Er: YAG laser evaluated and followed for 12 months.

REFERENCES

The bibliography contains 192 sources, of which 10 are in Cyrillic, and 182 are in Latin, which is sufficient for a comprehensive analysis and discussion of the dissertation topic.

APPLICATIONS

They are presented correctly.

DISSERTATION RELATED PUBLICATIONS

They are sufficient to reflect and promote the activities of Dr. Nikolay Simeonov in connection with the dissertation work. These are four full-text publications, one of which is in a refereed journal and two participations with oral presentations in scientific forums.

ABSTRACT OF THE DISSERTATION

The abstract corresponds to the content of the dissertation work. At 56 pages, an introduction, goals and tasks, the material and methods, the development results, and their discussion are presented. The following are the conclusions, contributions, publications and participation in scientific forums and projects related to the dissertation. Fifteen tables and 48 figures, which fully reflect the results of the dissertation work, are included.

CONCLUSION

The dissertation "Influence of the preparation of hard dental tissues with the Er: YAG laser on the adhesive layer", presented by Dr Nikolay Maksimov Simeonov, is designed according to the generally accepted requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria. The dissertation has scientific and applied value and is the personal work of the doctoral candidate. The author realized the goal and objectives of the dissertation ultimately. The dissertation work enriches the knowledge of the scientific community regarding the effects of Er: YAG laser preparation on dentin and the qualities of the adhesive bond to a laser-treated dentin surface achieved using an adhesive system containing the functional monomer 10-MDP; it provides dental practitioners with a clinical protocol for using the Er: YAG laser in dental hard tissues preparation based on authors laboratory and clinical findings.

The dissertation shows that Dr Nikolay Simeonov possesses in-depth scientific knowledge and professional skills in the scientific speciality of Therapeutic Dental Medicine, demonstrating qualities and skills for independently conducting scientific research and formulating scientific conclusions.

I give a positive assessment to the dissertation - "Effect of the preparation of hard dental tissues with Er: YAG laser on the adhesive layer", presented by Dr. Nikolay Maksimov Simeonov. It meets all the scientometric criteria for obtaining the educational and scientific degree. "doctor" according to the Regulations for the organization and activity of the MU - Plovdiv and the Law on the Development of the Academic Staff in the Republic of Bulgaria.

I vote with conviction "yes" and propose to the respected members of the scientific jury to vote positively for Dr Nikolay Maksimov Simeonov to acquire the scientific and educational degree "doctor" in Doctoral program: Therapeutic Dental Medicine, Professional direction: 7.2. Dental Medicine, Higher Education Area: 7. Health Care and Sports.

14.01.2024
Sofia

Заличено на основание
Чл.5 §1, б. "В" Регламент (ЕС)2016/679

Associate Professor Sevda Mihailova Yantcheva, Ph.D