OPINION

by Assoc. Prof. Dr. Elka Nikolaeva Radeva, DMD, PhD

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External member of the scientific jury for MU-Plovdiv

(Order № P-2155 / 04.12.2020 of the Rector of MU-Plovdiv)

of dissertation for awarding the educational and scientific degree "Doctor"

professional field: 7.2 Dental medicine

doctoral program: Therapeutic dentistry

Author: **Dr. ALEXANDRA GEORGIEVA PECHEVA – STOEVA**
Form of doctoral study: self-training

Department: Operative Dentistry and Endodontics, FDM, MU-Plovdiv

Topic: "Application of zirconium CAD / CAM veneers in vital front teeth (questionnaires, laboratory and clinical studies)"

Scientific adviser: Prof. Dr. Snezhana Tsanova, MD

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1. General presentation of the procedure and the doctoral candidate

The presented set of materials on paper is in accordance with Article 115 (1) of the Procedure for Acquisition of educational and scientific degree "Doctor" in MU - Plovdiv; Regulations of MU-Plovdiv from 06.11.2014 and includes all necessary documents.

Dr. Alexandra Georgieva Pecheva - Stoeva was born on 21.02. 1990 in the city of Plovdiv. In 2015 he graduated with a master's degree in dental medicine. Since 2016 she has been an assistant in the Department of Operative Dentistry and Endodontics, FDM-Plovdiv. Since 2017 she has a master's degree in health management. In 2019 she acquired the specialty of Operative Dentistry and Endodontics.

In 2019, Dr. Pecheva-Stoeva was enrolled as a doctoral candidate in an independent doctoral program: "Therapeutic Dentistry" at the Department of "Operative Dentistry and Endodontics" of FDM- Plovdiv for a period of 3 years with order № R-2561 /12.11.2019 and was enrolled by order № P-2144 / 01.12.2020.

The doctoral candidate has attached copies of 3 full-text publications in connection with the dissertation and a list of 3 participations in scientific forums.

Structure of the dissertation

The dissertation is presented on 180 pages, contains 3 appendices, a list of publications and participation in scientific forums related to the dissertation.

The structure of the dissertation includes: introduction - 2 pages, literature review - 38 pages, goal and tasks - 1 page, materials and methods for each task (from 1 to 5) - 39 pages, the results and discussion are presented together on the individual tasks and conclusions are drawn on each of them - 56 pages, recommendations to dentists - 5 pages, conclusions - 1 page, contributions - 2 pages, references-16 pages, appendices - 9 pages, publications and scientific communications in connection with the dissertation - 1 p.

2. Relevancy of the topic

The presented dissertation examines a current problem related to the application of indirect veneers in vital frontal teeth using modern CAD / CAM technologies. In recent years, there has been accelerated improvement and development of new ceramics with improved optical and physical properties, which allows for the production of restorations with high aesthetic qualities. At the same time, the application of CAD / CAM technologies expands the capabilities of both the clinician and the dental technician.

Veneer treatment is a minimally invasive method for preparation of hard dental structures, mainly in the enamel and is the subject of operative dentistry.

In the present dissertation research on the application of zirconium veneers of specially developed material for machine milling UTLM (Katana) is carried out.

3. Knowledge of the problem

The literature review covers 38 pages. It is presented in chapters, and is related to the future experimental and clinical part of its own research. It is based on 197 literary sources - 3 of them are in Cyrillic and 194 in Latin, and 36% are from the last 10 years.

The literature review analyzes the aesthetic parameters of the smile, presents the classification of veneers according to the coverage of the vestibular surface, the involvement of the proximal walls, the method of manufacture and the material used. The indications and contraindications for making veneers are considered. A critical analysis of the choice of veneer material, advantages and disadvantages of CAD / CAM technologies, as well as the preparatory design for veneers.

Magnifying techniques and their importance for the accuracy of the preparation are considered - without magnification, with magnifying glasses and a microscope. The literature data on the marginal adaptation of veneers to the prepared tooth surface and the assessment methods are summarized. The issues regarding the aging of zirconium ceramics are analyzed.

The literature review concludes with a summary of unresolved issues related to the application of CAD / CAM zirconium veneers.

The analysis of the literature review shows an in-depth knowledge of the problem by the doctoral candidate.

4. Research methodology

Based on the analysis from the literature review, the purpose of the dissertation is formulated, namely: to study the advantages and disadvantages of CAD / CAM zirconium veneers.

The selected materials and methods correspond to the set tasks for achieving the goal. The following methods were used:

Under Task 1, a survey was conducted among 262 dentists in the Plovdiv region during events organized by the professional organization in the period November 2017-April 2018.

In in vitro studies:

In Task 2, 60 plastic teeth (central incisors) were used to study the effect of magnifying techniques on the accuracy of the preparation using a Wieland D800 laboratory scanner (Ivoclar Vivadent).

In the third task, 32 freshly extracted natural maxillary incisors, restored by veneers using two different technologies (CAD / CAM zirconium veneers and press ceramic veneers) were used to study the marginal adaptation of the restoration to the tooth surface by CEM observation.

Measurements were made in the cervical area, incisal area, 3 points on the inner sagittal section and 3 points on the outer proximal wall.

Another 27 extracted teeth were used in Task 4 to study the effect of hydrothermal aging on the color and translucency of zirconium veneers made of ultratranslucent zirconium ceramics UTML KATANA, Kurraray, Noritake Japan.

The clinical study included 7 patients aged between 18 and 40 years (with a total of 35 indirect zirconia veneers). For this purpose, a personal clinical card has been developed to document clinical cases. Patients have signed a declaration of informed consent. A detailed protocol for the cementation of both types of veneers is presented. Using Ryge and Cvar's modified USPHS criteria for direct clinical evaluation, indirect recoveries were assessed immediately after cementation and at 6 months.

Appropriate statistical methods for data processing have been used.

The research was conducted in the Department of Operative Dentistry and Endodontics, CAD / CAM Research Center at FDM-Plovdiv, and Laboratory of Electron Microscopy and Microanalysis, Institute of Physical Chemistry, BAS.

The results are well illustrated in 63 figures and 22 tables. Discussion has been made against other similar studies.

Conclusions - 5 conclusions are presented, which are in correlation with the set tasks.

Based on our own research, clinical recommendations have been made to dentists to achieve optimal treatment results in recovery through indirect veneers.

5. Characteristics and evaluation of the dissertation and contributions

In the present dissertation a study is made on the advantages and disadvantages of CAD / CAM zirconium veneers.

A survey of dentists found that 48.7% of respondents do not make indirect veneers, and 81.2% do not use CAD / CAM technology. Some of the reasons for this are the lack of experience and skills, unpredictability of the end result, distrust in the laboratory, high cost.

The effectiveness of magnifying aids for more precise preparation of hard dental tissues for veneers has been confirmed. They provide better illumination and visualization, and are recommended for precise minimally invasive treatment.

The marginal adaptation of CAD / CAM zirconium veneers and press-ceramic restorations has been comparatively studied, and the results show higher precision in CAD / CAM technology.

The significance of the thickness and color of the veneers for their change over time was evaluated by the method of hydrothermal aging.

In the clinical task, the results obtained confirm the effectiveness of digital modeling of veneers to achieve excellent aesthetics in the frontal area.

Recommendations are attached to the dentists regarding the clinical protocol in the production of veneers, which is extremely useful for dental practice.

Based on the overall development, 5 contributions with original character and 5 contributions with confirmatory character have been formulated.

6. Assessment of the publications and personal contribution of the doctoral candidate

Photocopies of 3 scientific publications in connection with the dissertation are presented, of which 2 in Bulgarian editions and 1 in foreign journals. In all of them the doctoral candidate is the first author.

Dr. Alexandra Georgieva Pecheva - Stoeva has presented 3 scientific papers at congresses and forums, of which 1 at national and 2 at international congresses.

I believe that the dissertation and its contributions are the personal work of the doctoral candidate, carried out under the guidance of her supervisor.

For clinical practice, the proposed recommendations for dentists are essential.

Most of the remarks and recommendations made in advance have been complied with. I have no significant remarks on the presented dissertation.

7. Abstract

The author's abstract is presented on 49 pages and includes 22 tables and 50 figures. The abstract in terms of content meets the requirements of the Regulations of MU-Plovdiv and comprehensively reflects the results obtained.

CONCLUSION

The dissertation contains scientific and scientific-applied results, which represent an original contribution to science and meet all the requirements of the law for development of the academic staff in the republic of Bulgaria.

The dissertation on "Application of zirconium CAD / CAM veneers in vital frontal teeth (questionnaires, laboratory and clinical studies)" shows that the doctoral candidate Dr. Alexandra Georgieva Pecheva - Stoeva has in-depth theoretical knowledge and professional skills in the medical specialty therapeutic dentistry, demonstrating qualities and skills for self-training research.

With this opinion I give my positive assessment of the research presented by the peer-reviewed dissertation, abstract, results and contributions, and I propose to the esteemed scientific jury to award the educational and scientific degree "Doctor" to Dr. Alexandra Georgieva Pecheva - Stoeva in PhD program in Therapeutic Dentistry.

08.01.2021 г. **Opinion authors:**

(Assoc. Prof. Dr. Elka Radeva, PhD)