REVIEW

from

Assoc-prof. Ilian Vangelov Hristov, DMD, PhD, Department of Prosthetic Dentistry, FDM - Plovdiv, external member of the Scientific Jury, elected by Decision of a meeting of the Faculty Council at the FDM at the MU - Varna according to Protocol No. 37/13.09.2024. and by order No. R - 109-298/24.09.2024 of the Rector of the MU - Varna, regarding a dissertation on the topic:

"Laboratory study of the accuracy of cemented superstructures on abutments fabricated by different impression-taking protocols."

for the awarding of an educational and scientific degree "Doctor" under the doctoral program "Orthopedic Dentistry" in professional direction 7.2. Dentistry by field of higher education 7. Health care and sports.

Doctoral student of self-study, **Dr. Gabriela Rosenova Kirova**, assistant-professor in the Propedeutics Department of Prosthetic Dentistry, FDM, MU - Varna.

Research supervisor: **Assoc-prof. Stoyan Georgiev Katsarov, DMD, PhD**

General presentation of the procedure and the PhD student

The presented set of materials on paper and electronic media is in accordance with the procedure and regulations for the acquisition of EScD "PhD" of MU – Varna.

Dr. Gabriela Rosenova Kirova was born on 03/09/1993 in the city of Varna. She graduated her secondary education at the Frédéric Joliot-Curie Language High School on 13.06.2012. In 2019 graduated as a master's degree in Dental Medicine, MU - Varna. From 2020 until 2023 specializes in Prosthetic Dentistry at FDM - Varna. She has attended numerous national and international courses and congresses to increase her qualifications, led by distinguished speakers from the country and abroad. She speaks English and Spanish at a very high level **/B2/**. She possesses good communicational and digital skills as well as good teamwork.

Structure of the dissertation

The dissertation submitted for reviewing is written on 190 pages, divided into eleven chapters, includes 20 tables, 105 figures and 3 appendices. 299 literary sources are cited, 23 of which are in Cyrillic and 276 are in Latin.

Relevance of the topic, purpose and tasks

The use of dental implants in modern prosthetic treatment is widely advocated, with priority being given to non-removable over removable prosthetics. Technologies are also developing at a rapid scale, as CAD-CAM and 3-D printing as subtractive and additive methods, respectively, are entering the dental practice. Doctors of dental medicine and their colleagues, dental technicians, increasingly have to use in their practice the new achievements of modern science, namely: intraoral and laboratory scanners. This of course raises a lot of questions. The most important of which from a prosthetic point of view is related to the accuracy of fit of the final restoration. This is precisely the main goal that Dr. Kirova sets for herself in her dissertation work, namely: *to make a comparative assessment of the accuracy of superstructures made by different methods and protocols for taking an impression, cemented on abutments and measured on microsections.*

Analysis of the literature review

The literature review is presented on 36 pages and shows the doctoral student's excellent awareness of the problem. It is written in good Bulgarian language and scientific style. The cited publications are up-to-date and contemporary and fully correspond to the topic of the dissertation. The dissertation examines in detail the various impression materials and methods in modern prosthetic dentistry and implantology. There is also a place for intraoral and extraoral scanning systems. Analog and digital strategies are compared, as well as different subtractive and additive manufacturing technologies. The literature review logically ends with an analysis of the marginal and internal fit of prosthetic structures on implant supports, which is the main goal of the dissertation work.

Analysis of the set goal and related tasks

The purpose of the dissertation work is precisely and clearly formulated. To achieve it, the PhD-student sets himself four tasks, the third task having two subtasks.

- *On the first task:* Two questionnaire surveys were made: Among dentists regarding awareness and preferences for impression techniques for transfer of implant superstructures. And among dental technicians for awareness of protocols for transfer of implant position and fabrication of non-removable restorations on abutment implants. The results of the surveys show that despite the wide spread of modern digital technologies, most of the

surveyed dentists still prefer conventional methods of operation. The respondents could not judge whether there is a difference between the accuracy of constructions made according to a digital protocol compared to classical methods. Most dental labs perform the scan on stage models with pre-selected abutments.

- *On the second task:* Regarding the assessment of the accuracy of implant-supported superstructures by measuring the thickness of the cementation layer of the caps, transferred in two ways with an intraoral scanner and made of zirconium dioxide by subtractive technology, a statistically significant difference was found between the groups of scanned analogues and scanned abutments.
- *According to the third task:* Comparative assessment of the accuracy of superstructures with supporting implants by measuring the thickness of the cementation layer of the caps, transferred in two ways with an intraoral scanner and made of Co-Cr alloy by additive technology - selective laser melting, it is proven that the use of scanning analogues provides better marginal adaptation and accuracy of fit of superstructures on abutment implants compared to scanning abutments in both technologies - milling and selective laser melting.
- *According to the fourth task:* Comparative assessment of the thickness of the cementation layer between the abutments transferred using scanning analogs and a directly scanned abutment with an intraoral scanner using subtractive and additive technology. Measurements show that the fit accuracy of both scanning methodologies and both manufacturing technologies are within clinically acceptable values, which does not affect the final outcome of the treatment. The combination of scanning analog and milling has the highest accuracy, followed by scanned abutments and milling, scanning analog and selective laser melting, and scanned abutments and selective laser melting.

Contributions

Three original, two confirmatory, and two purely applied contributions have been derived from the dissertation. The proposed methodology for making samples for the study of marginal adaptation and accuracy of fit could also be used for future analogous studies. The proposed classification of a combination of scanning method and production technology depending on the accuracy of fit can be used with success in the clinical practice of fellow implantologists.

Publication activity of the doctoral student

The presented three articles in English-language journals fully correspond to the subject of the dissertation work. They prove the author's ability to make in-depth scientific analyzes and correctly interpret the obtained results.

Abstract

The presented abstract is written on 72 pages, meets all the requirements of the regulations for the acquisition of the EScD "PhD" of the MU - Varna and reflects the set goals, tasks, conclusions and contributions related to the dissertation work.

CONCLUSION

The dissertation on the topic **"Laboratory study of the accuracy of cemented superstructures on abutments produced according to different impression taking protocols "** contains scientific and applied results, representing an original contribution to science and fully meeting the requirements of the Law on the Development of Academic Staff in Republic of Bulgaria /ZRASRB/, the Regulations for the implementation of ZRASRB and the Regulations of the Medical University - Varna.

The dissertation proves that **Dr Gabriela Rosenova Kirova** possesses in-depth theoretical knowledge and practical abilities in the specialty "Prosthetic Dentistry" by demonstrating qualities and skills for independent conduct of scientific research and interpretation of the obtained results.

As a result of all above mentioned, I will vote with conviction and categorically **"POSSITIVE"** the awarding of the educational and scientific degree **"PhD"** to Dr. **Gabriela Rosenova Kirova** , in the doctoral program "Orthopedic dentistry" in professional direction 7.2. Dentistry by field of higher education 7. Health care and sports.

Prepared the review:

03.11.2021

Assoc-prof. Ilian Hristov, DMD, Ph.D.

Department of Prosthetic Dentistry

FDM, MU - Plovdiv