

OPINION

by Prof. Dr. Petya Filipova Pechalova – Petrova, PhD, Department of Dental, Oral and Maxillofacial Surgery, Faculty of Dental Medicine, MU - Plovdiv, member of the Scientific Jury, designated by Order No. R-109-208/ 03.06.2026 r. of the Rector of MU – Varna

Regarding: Dissertation titled "Rehabilitation of completely edentulous patients with complete dentures fabricated using a digital protocol – possibilities, advantages, and disadvantages" for the award of the educational and scientific degree of "Doctor" for awarding a doctoral degree in the doctoral program of "Prosthetic Dentistry," professional field: 7.2 Dental Medicine, sphere of higher education: 7. Healthcare and Sports.

Author: Dr. Yordanka Donkova Shekerova, PhD student at the Department of "Dental Materials Science and Prosthetic Dentistry", Faculty of Dentistry, Medical University - Varna.

Academic supervisor: Assoc. Prof. Dr. Desislava Atanasova Konstantinova, PhD

1. General presentation of the procedure and the doctoral student

The presented set of materials is in accordance with the Regulations for the Development of the Academic Staff at MU – Varna.

2. Biographical notes:

Dr. Yordanka Donkova Shekerova obtained the degree of "Master of Dental Medicine" at the Medical University - Plovdiv in 2015. Since 2018, she has been a part-time assistant in the Department of Prosthetic Dental Medicine, Faculty of Medicine,

Medical University - Varna. Since 2021, she has been a full-time assistant in the Department of Dental Materials Science and Prosthetic Dental Medicine, Faculty of Medicine, Medical University - Varna. She acquired the rights of a specialist in Prosthetic Dental Medicine in 2023. In the same year, she was enrolled as a full-time doctoral student in the doctoral program "Prosthetic Dental Medicine" at the Department of Dental Materials Science and Prosthetic Dental Medicine, Faculty of Medicine, Medical University - Varna.

3. Significance of the Theme:

In the human population, there is a tendency to increase life expectancy. With advancing age, various changes occur in organs and systems. In dentistry, a significant problem associated with age is the complete loss of teeth. In this regard, the dental rehabilitation of completely edentulous patients by applying digital technologies in the manufacture of complete dentures is a significant and current problem. Despite the dynamic development of implantology and CAD/CAM systems, in certain cases, complete dentures are preferred for restoring function and aesthetics in patients with complete tooth loss. The modern digital technologies offer new opportunities for optimizing the clinical and laboratory stages of complete denture fabrication; however, systematized data regarding their application are scarce. Therefore, I consider the topic of this dissertation to be timely and significant from both theoretical and practical perspectives.

4. Knowledge on the problem:

In her dissertation, Dr. Yordanka Donkova demonstrates in-depth theoretical knowledge on the topic of the anatomical and morphological features of edentulous jaws, imaging methods, impression materials and techniques, as well as modern digital protocols for the manufacture of complete dentures. The features of bone atrophy in the upper and lower jaws are examined, the different classifications of bone atrophy and their clinical significance in planning prosthetic treatment are analysed, attention is paid to the condition of the mucous membrane of the prosthetic field and the functional role of soft tissues, the importance of the valve area and functional modelling

of the edges of the functional impressions for achieving stable retention in complete dentures is emphasized. The review discusses the two-dimensional and three-dimensional imaging methods used in the diagnosis of completely edentulous patients. The possibilities and limitations of orthopantomography, teleradiography, CBCT and other digital methods are analysed. It is emphasized that CBCT provides reliable three-dimensional information about bone morphology and allows for precise digital planning. The characteristics of alginates, silicones, polyethers and vinyl-polyether-silicones are presented, as well as their application in anatomical and functional impressions. The advantages and disadvantages of conventional and digital impression methods are discussed. The doctoral student has made a critical analysis of modern digital protocols for the manufacture of complete dentures. The possibilities of digital modelling, 3D printing and milling in the total rehabilitation of completely edentulous patients are examined.

Following a critical analysis of the literature, the goal of the dissertation work was formulated: "based on clinical, experimental and statistical studies, to study the possibilities, advantages and disadvantages of using additive technologies in the rehabilitation of totally edentulous patients, improving efficiency and precision by developing and implementing an advanced digital protocol based on morphometric analysis, experimental design of an individual tray and a shortened algorithm for clinical work." For its implementation, five tasks were skillfully selected, which were correctly performed using modern methods.

5. Methods of the Study:

The study included completely edentulous patients who underwent clinical, morphometric and experimental examinations. Modern imaging-diagnostic, clinical, microbiological and statistical methods were used.

Task 1: a morphometric analysis was performed using CBCT. The sagittal and vestibulo-oral dimensions of the upper and lower jaw were examined along predefined reference lines. The data obtained were used to analyze morphological dependencies and develop standardized guidelines for digital planning of complete dentures.

Task 2: A clinical evaluation of 60 complete dentures fabricated using digital protocol and additive technologies was performed. Retention, stability, peripheral fit, comfort, phonetics, and aesthetics were analysed.

Task 3: An experimental model of the "Occlutray" custom impression tray—designed for simultaneous functional impression taking and intermaxillary registration—was developed and validated. An industrial design patent has been registered. A microbiological study of 3D-printed PLA and ABS trays was conducted by assessing microbial contamination following a disinfection protocol.

Task 4: Analysis of the time efficiency of different functional impression techniques and materials was performed.

Task 5: An algorithm was developed for optimizing and reducing the clinical stages in the partial digital protocol.

Statistical processing of the obtained results was performed using statistical software SPSS v.20.0. Methods of descriptive statistics, comparative analysis, t-test for independent samples, Mann–Whitney U test, Kruskal–Wallis test, χ^2 analysis and Spearman correlation analysis were used. Statistical significance was accepted at the $p < 0.05$ level.

6. Characteristics and Evaluation of the Dissertation and Contributions:

The dissertation of Dr. Yordanka Donkova Shekeroval is properly structured, contains all the basic elements for presenting a dissertation: introduction, literature review, aim and objectives, material and methods, results and discussion, conclusions, conclusion, contributions, bibliography and applications.

The dissertation is written on 232 standard typewritten pages, illustrated with 70 tables, 119 figures and 5 applications. The bibliography includes 337 literary sources.

The results are comprehensively and correctly described, analyzed, interpreted and critically discussed in the light of similar studies. The dissertation ends with a conclusion based on the results, the discussion, the generalizations made and arising naturally from them.

7. Contributions and significance of the work for science and practice:

I accept the contributions presented by the doctoral student.

8. Assessment of the doctoral candidate's publications and personal contribution:

Three publications are presented - in the Journal of IMAB and the Journal of the Union of Scientists - Varna, reflecting the results of the dissertation work. The publications related to the dissertation meet the quantitative requirements set in the Act for the Development of the Academic Staff in the Republic of Bulgaria and its Implementation Rules.

9. Personal participation of the doctoral student:

The research and observations of patients conducted and the conclusions and contributions resulting from them in the dissertation are the personal work of the author.

10. The author's summary effectively reflects the essential aspects of the dissertation and has been prepared in accordance with the requirements of the Law on the Protection of Scientific and Technical Research of the Republic of Bulgaria and the regulations of the Medical University of Varna and reflects the results achieved in the dissertation.

11. Critical remarks and recommendations:

I have no remarks on the material presented.

CONCLUSION

The problem under consideration is relevant, and the presented dissertation "Rehabilitation of completely edentulous patients with complete dentures fabricated using a digital protocol – possibilities, advantages, and disadvantages", prepared in

accordance with legal requirements, contains original and scientifically applied contributions that satisfy the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADSRB), the Regulations for the Implementation of the ADSRB and the relevant Regulations of MU - Varna. The above gives me a reason to vote positively for awarding Doctoral Degree in the scientific specialty of " Prosthetic Dentistry " to Dr. Yordanka Donkova Shekerova.

26 June 2026

The opinion was prepared by.

(Prof. Petya Pechalova, PhD)

Заличено на основание чл. 5,
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