

Department of Prosthetic Dentistry

Faculty of Dental Medicine

Faculty of Medicine -Plovdiv

Review

by Prof. Stefan Ivanov, Ph.D

The review was prepared in accordance with the requirements of the Law on the Development of the Academic Staff of the Republic of Bulgaria and the Regulations for the Development of the Academic Staff of the Medical University – Plovdiv regarding; for the awarding of an educational and scientific degree, scientific specialty 030303., doctor" to Dr. Magdalina Ivanova Urumova on the subject; "Laboratory study of the retention force of telescopic crowns produced by different methods"

Dr. Urumova presents the dissertation development on 156 pages in the following form;

Table of Contents -2 p.	Abbreviations used - 2 p.
Introduction - 2 p.	Literature review - 28 p.
Liter analysis. overview - 1 p.	Purpose and tasks - 1 p.
Materials and methods - 21 p.	Results and discussion -78 p.
Conclusion - 3 p.	Conclusions - 2 p.
Contributions - 1 p.	Bibliography - 24 p.
Publications and participations - 2 p.	Appendix -14 p.
Authors-224. kyr.-21, lat.-203 32 tables and 106 figures are included,	

Biography

Dr. Magdalena Ivanova Urumova

Dr. Magdalena Ivanova Urumova was born on 23rd of March 1986 in Plovdiv. She finished her secondary education at "St. Patriarch Euthymii" in 2005 with a German language profile and as a private student of EG "Plovdiv" in 2004. In the same period, she attended German language courses at "Goethe Institut and received a C1 level certificate.

In 2011 graduated from the Medical University - Plovdiv with a specialty "Dental Medicine". Since 2011 until 2013 she practiced her profession at AGPPPDM "Harisma" - OOD. Regular member of BZS. She attends practical courses and lectures to improve her professional knowledge and skills. Since 2013 until 2015 practices in Germany. In 2016 returns to Bulgaria, practices her profession in own practice and receives a Cambridge B2 level English language certificate.

In February 2017, she took a competitive exam and took the position of assistant in the Department of Prosthetic Dental Medicine at the Faculty of Medicine, MU-Plovdiv. In 2020 acquires a specialty in Prosthetic Dentistry.

In the literature review is made an in-depth analysis of various metal alloys and methods for the manufacture of telescopic crowns. Dr. Urumova indicates all resolved, known, debatable and controversial issues. The question of the medico-biological and technological qualities of various metal alloys and methods for the manufacture of telescope crowns is insufficiently examined.

Publications about telescopic crowns in the specialized literature and in Bulgaria are insufficient. In the fabrication of this type of complex attachments is required great precision. Using the possibilities of CAD/CAM technology, Dr. Urumova

gathered courage and set about solving this extremely difficult problem. She enriches our knowledge with achievements in her dissertation work.

The aim of the dissertation is: Research and evaluation of the retention force of telescopic crowns produced with different design.

With the help of the four tasks, the dissertation student achieves her set goal. Dr. Urumova creates her modern scientific methodology with the application of the most advanced devices - based on CAD/CAM technology.

Task 1. Conduct a survey on the informedness of dentists and dental technicians about working with telescopic crowns.

Task 2. Telescopic crowns are produced, using a developed own methodology, which ensure good and long-term retention.

Task 3. Development of an apparatus for cyclic mechanical loading of test samples.

Task 4. Research and comparison of retention force in 4 groups of test samples with different design and technology.

First sub-task: Research and comparison of retention in four groups of test specimens with the same taper angle of 4° , by CAD/CAM technology.

Second subtask: Investigation and comparison of the retention force of three groups test specimens with different taper angles.

Material and methodology

According to the first task: a survey was conducted among dental technicians and doctors of dental medicine in the country during the period February - July 2018. Among dental technicians 65 people (35 men and 30 women) took part in the study, and among dentists a total of 208 people (100 men and 108 women).

On the second task: Dr. Urumova creates her own methodology for producing telescopic crowns, and the design of the crowns includes two additional retentive elements on the distal surface (chute and hemisphere), which ensure long-term and good retention.

According to the third task: With the designed apparatus, was performed a mechanical-cyclic laboratory study of the retention force of the telescopic crowns produced by different methods. The study was carried out with the help of the "Electronics" department, Technical University of Plovdiv. The tests are performed in a special environment of artificial saliva with a certain pressure force, setting the desired parameters - number of cycles (1-10000), time to perform one cycle (from 1 to 3 seconds), load force (up to 50 N). The technological process is described in detail.

On the fourth task: Dr. Urumova creates her own methodology, as the design of the crowns includes two additional retentive elements. She conducted the study to compare the retention of the telescopic crowns, making 4 groups of trial specimens of different designs through 3D-printing, each containing 10 specimens (n=10).

1st group - classical method. The primary telescope is designed with a cylindrical-conical design meeting established standards. The conical part is at an angle of 4°.

2nd group – according to the FGP methodology of Bredent, Germany.

The telescopes are held in place using epoxy resin. The primary telescope has a taper angle of 4°.

3rd group - according to the Usig-folie method of Erkodent, Germany. In this method, the telescopes are held in place using composite resin. The design of the telescopic crowns is cylindrical-conical, with a taper angle of 4°.

4th group. Along the proximal wall of the primary telescopic crown, there are two additional retentive elements - a chute ending with a hemisphere. Four subgroups were made:

Subgroup 1. Telescope height 5 mm, cylindrical-conical design and taper angle of 4°.

Subgroup 2. Telescope height 6 mm, cylindrical-conical design and taper angle of 2°.

Subgroup 3. Telescope height 5 mm, cylindrical-conical design and taper angle of 2°.

Subgroup 4. Telescope height 5 mm, cylindrical-conical design and taper angle - 0°.

Results and discussion

During the survey among dental technicians, the following findings were obtained:

1. According to the technology of making the telescope-crowns:

- FGP (Bredent) – 4.6 %
- Electroplating - 6.15%
- CAD-CAM – 7.69 %
- Model casting – 58.46 %

2. Primary telescope milling height

- 2 mm – 13.85 %
- 3 mm – 40 %
- 5 mm – 15.38 %

3. Preferred alloy

- golden - 12.31%
- nickel – 29.3%
- chrome-cobalt – 30.77%

For dentists, the following preferences are taken into account when making telescopic crowns:

1. Model casting
2. CAD-CAM system
3. FGP (Bredent)

According to the respondents, the survey found that, telescopic crowns were not superior to other abutments.

For the second task, a new methodology for producing telescopic crowns was proposed. Depending on the milling method, the telescopic crowns are divided into sinking and non-sinking.

1. Telescopic crown retention has a number of advantages over other retention methods.

2. The hemisphere plays the role of a shock absorber.

According to the third task, an apparatus was created for cyclic mechanical loading of the experimental samples, from which it can be concluded:

1. The device allows you to set various parameters - time to perform one cycle, number of cycles and pressure strength.

2. The design of the apparatus for repeated cyclic mechanical loading should also be applied to other prosthetic elements.

According to the fourth task, studies of the friction force of four groups of test samples were made. The summarized values from the tests show that the minimum retention value is 1 N and the maximum is 3.33 N. The highest retention values are found in the fourth d group with 0° taper angle – 3.33 N.

The dissertation student applies various statistical methods: Pearson analysis; modified Rao Scott assay; Shapiro-Wilks test; Fisher's exact test; analysis of variance; correlation analysis; comparative analysis; graphical and tabular method.

Conclusions - 11 conclusions of scientific value were made from the dissertation

Contributions:

Contributions of a confirmatory nature - 2 pieces

Contributions of a scientific and applied nature - 3 pieces

Contributions of an up-to-date nature - three issues that are applied and described in dentistry for the first time in our country

Publications and participations related to the dissertation work:

Full-text publications - 3 issues, Dr. Urumova occupies 1 position

Participation - 4 pieces, Dr. Urumova occupies 1st position

Abstract

The content and quality of the abstract meets all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria. It is a miniature copy of the dissertation.

I have made critical notes in the process of creating the dissertation work. They are completely satisfied.

Conclusion

The dissertation is an original contribution to science and meets all the requirements of the law on the development of the academic staff in the Republic of Bulgaria. Dr. Urumova enriched our knowledge by having the courage to solve this difficult problem. Its rich information is due to the large number - 224 contemporary cited authors.

For the first time in Bulgaria, a survey was conducted regarding the informedness and knowledge of fellow dental doctors and dental technicians.

For the first time in our country, a laboratory apparatus for mechanical-cyclic loading of experimental samples has been made.

For the first time in our country, Dr. Urumova examines a modern, little-known, unstudied material in the field of Prosthetic Dental Medicine.

She creates her methodology in the developed work, which will inevitably increase the quality and long-term retention of removable prosthetic structures. Using the capabilities of CAD/CAM technology, Dr. Urumova proved for the first time in our country that the primary and secondary telescopic crowns can be designed simultaneously.

The dissertation contains scientific and applied results that represent an original contribution to dental practice and theory. The dissertation development is primarily a personal work of Dr. Urumova. It resorts to collaboration with narrow specialists only where narrowly specialized competence is needed. In order to prove the reliability of the obtained results, the doctoral student applies various statistical methods - more than 8 in number. Dr. Urumova meets all the mandatory conditions of the scientometric criteria for awarding the title of DOCTOR.

Due to the above, I confidently give my positive assessment of the conducted research in the dissertation work and the achieved results and scientific contributions in the field of dentistry.

As a member of the honorable jury, I will vote with conviction "YES" for awarding the educational and scientific degree "DOCTOR" to Dr. Magdalena Ivanova Urumova.

Date: 10/08/2022

Reviewer:



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

/Prof. Dr. Ivanov-dm/