

## Review

from

Prof. Dr. Yavor Stefanov Kalachev, MD, Department of Prosthetic Dental  
Medicine, FDM, Medical University - Plovdiv

on Dissertation for Award  
of educational and scientific degree "Doctor"

Author: Dr. Magdalina Ivanova Urumova

Topic: Laboratory study of the retention force of telescopic crowns produced by  
different methods

Brief biographical data about the doctoral student:

Dr. Magdalina Ivanova Urumova was born on 23rd of March 1986 in Plovdiv. In 2005, she graduated from Secondary School "St. Patriarch Euthymii", and in 2004 EG "Plovdiv" as a private student. In 2011, she graduated Dental Medicine at FDM-Plovdiv, and in 2017 was accepted as a full-time assistant in the Department of Prosthetic Dentistry at FDM-Plovdiv. In 2021, he acquired the specialty "Prosthetic Dentistry". There are publications in the field of prosthetic dentistry and participation in a number of Bulgarian and international scientific forums.

The dissertation work submitted to me for opinion contains 186 standard typewritten pages with an included bibliography of 224 authors, of which 21 in Cyrillic and 203 in Latin, and 6 appendices. Illustrated with 107 figures and 37 tables. The dissertation development is well structured, which made it easier for me to prepare the review.

The Introduction highlights the fact that removable partial dentures are one of the oldest methods of restoring edentulous areas of the oral cavity. Of crucial importance in the design of removable partial dentures is the correct choice of the

type of construction, the design, the retentive elements and the materials that are used.

Telescopic crowns are used both as a complex supporting and retentive element in combined dentures, and in the production of removable fixed complex bridge prostheses with telescopic crowns. One of the main advantages of removable partial dentures with precision attachments - telescopic crowns is the secondary splinting of the abutment teeth, as they are indirectly connected to each other.

In the Literary Review, issues related to: historical review of the application of telescopic crowns as supporting means of partial dentures are discussed; technological process in laboratory technologies: classical methods, laboratory technology by the method of model casting, milling, electroplating; materials for making telescopic crowns: metal alloys, ceramics based on zirconium dioxide, thermoplastic materials, etc.

The facts stated above determine the relevance of the dissertation development and give the doctoral student a reason to formulate:

The aim of the dissertation: to investigate and evaluate the retention force of telescopic crowns produced with different designs.

The material and methods of the research are correctly selected, the use of a sufficient number of modern statistical methods for processing the obtained data guarantees the obtaining of reliable and objective results.

In order to fulfill the goal set in this way, 4 tasks were formulated and implemented. The more important results obtained are:

**Task №1:** Conducting a survey on the informedness of dentists and dental technicians about working with telescope-crowns

A survey was conducted among doctors of dental medicine and dental technicians practicing in the country. Own questionnaire was developed, including 8 questions.

Completing this task enables the following findings:

1. The number of dentists who used telescopic crowns in their practice constituted a little more than one third of the questionnaire.
2. The number of dental technicians who made telescopic crowns included in the survey slightly exceeds that of those who did not work with this type of construction.
3. After processing the survey, the dental technicians' preference for the use of the model-casting and milling technique for making telescopic crowns over alternative innovative technologies is clear.

**Task №2:** Propose and develop a method for making telescopic crowns, ensuring good and long-term retention.

A new methodology for making telescopic crowns is proposed. After analyzing the data in the scientific literature and completing the task, the following conclusion can be made:

1. A modified method for making telescopic crowns has been developed in order to increase the retention force.
2. The methodology developed by us can be applied with standard dental equipment.

**Task №3:** Development of an apparatus for cyclic mechanical loading of test specimens.

An apparatus for cyclic mechanical loading of test specimens was created and the following findings can be made:

1. The device developed by us allows programming of various parameters - time for performing more than one cycle, number of cycles, pressure force.
2. The design of the apparatus allows testing for multiple cyclic mechanical loading and for other prosthetic elements.

**Task №4:** Research of the retention force of four groups of test specimens telescopic crowns with different designs

Researches of the frictional force of four groups of test specimens were made, four groups of test specimens were designed, made by CAD/CAM technology, the following can be concluded:

The summarized values from all the tests performed on the two groups of test specimens show that the minimum retention value is 1N and the maximum is 3N. The test carried out on the apparatus was carried out with regulation by means of an electronically programmable part up to a value of 50N.

1. The highest retention value was found in the fourth d group - 3.33N
2. The lowest value of retention force was recorded in the third group - 1N
3. The developed method ranked third in retention force.

The results of the research make it possible to draw the following more important conclusions:

1. Very few dentists in the country use telescopic crowns as a complex attachment in their daily practice.
2. The majority of dental technicians who took part in the survey prefer techniques such as model-casting and milling for making telescopic crowns.
3. The created apparatus for cyclic-mechanical loading through the container for artificial saliva, approaches the conditions in the oral cavity.
4. The created apparatus for cyclic-mechanical loading is also applicable to other prosthetic elements.
5. The data from the study of the samples of the first group (classical) and the second group (FGP) after being subjected to cyclic mechanical loading of 6000 cycles of insertion and separation of the elements, shows that the samples of the second group (FGP system) have better retention when tested with the device.
6. The data obtained from the study of the samples from the four groups, after being subjected to a mechanical-cyclic load of 6000 cycles indicate that in the samples from the fourth d group made according to the method developed by the team (with a taper angle of  $0^\circ$  and a height of the telescope of 5 mm) the force of retention was the best compared to all other groups.
7. The wear resistance of the experimental samples decreases with an increase in the number of cycles of mechanical cyclic loading, regardless of the applied methodology, etc.

The research results enable the following more important contributions to be made:

#### Contributions of a confirmatory nature

It is conclusively proven that the wear resistance between the primary and secondary crown telescopes decreases over time.

Strict compliance with the phasing of the protocol in the technological manufacture of the telescopic crowns leads to their accuracy and level of retention.

#### Contributions of a topical nature

For the first time in Bulgaria, a survey was conducted on the informedness of the knowledge, application and technologies for making telescopic crowns by dentists and dental technicians.

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

For the first time in our country, the retention force of telescopic crowns is being investigated through tensile tests in different mode and retentive elements specially made for the research.(acting as jaws).

#### Contributions of a scientific and applied nature

It has been proven that the laboratory apparatus for mechanical cyclic loading of test specimens is also applicable to other complex prosthetic constructions that require loading along the longitudinal tooth axis.

It has been established that the proposed and clinically approved method, including additional elements, leads to good retention of the telescopic crowns.

It has been confirmed that the design of the primary and secondary telescopic crown using CAD/CAM technology can be carried out simultaneously.

#### Assessment of publication activity

In relation to the dissertation work, Dr. Urumova presents 3 publications and 4 participations in scientific forums. These facts prove that the topic developed in the dissertation is her personal work.

The abstract objectively reflects the dissertation work. It is made according to the requirements of the law on the development of academic personnel.

I have no critical comments on the dissertation work given to me for review.

Conclusion:

The dissertation work of Dr. Magdalena Ivanova Urumova is an in-depth laboratory study of the holding power of telescopic crowns produced by different methods

The obtained results are valuable for clinical practice and can serve as a basis for future research.

I confidently give my positive vote for awarding the educational and scientific degree "Doctor" to Dr. Magdalena Ivanova Urumova



Заличено на основание  
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