

## REVIEW

by Assoc. Dr. Elitsa Georgieva Deliverska-Alexandrova, PhD

Department of DOCMFS, FDM, MU – Sofia

(member of the Scientific Jury approved by order No P-109-308/13.06.2023 of  
the Rector of MU – Varna)

**of a thesis for the award of education and scientific degree "Doctor" in the field: Higher education: 7. Health and sports. Professional field: 7.2. Dentistry. Doctoral Program: "Surgical Dentistry"**

**a dissertation on the topic: "Clinical results of the application of platelet concentrates in post extraction areas using new protocols for the extraction of platelet rich plasma"**

**Author: Dr. Atanaska Yordanova Cheshmedzhieva, PhD student, independent form of training in the procedure for acquiring the educational and scientific degree "Doctor", Faculty of Dental Medicine, Medical University – Varna.**

**Scientific supervisor: Prof. Dr. Rosen Kolarov, PhD**

### 1. General presentation

This review has been prepared on the basis of an order of the Rector of MU – Varna, No P-109-308/13.06.2023.

The presented set of materials in paper and electronic form is properly formed, arranged and in accordance with Art. 44 (3) of the Rules for the Development of Academic Staff at MU - Varna, and meets the requirements of the *rules of procedure for degree "Doctor"*.

The dissertation is structured correctly, according to the academic requirements adopted in our country: an introduction; a literary review; a conclusion and critical analysis; a purpose and tasks; materials and methods; results and a discussion; conclusions; contributions; a bibliography and a list of publications related to the dissertation; annexes. It is presented on 180 pages, illustrated with 45 figures, 28 tables and 24 photos. The bibliography includes 264 titles, of which 6 are in Cyrillic and 258 in Latin.

4 publications on the topic of the dissertation work are attached – two Dr. Cheshmedzhieva is an independent author and two – the first author; There are also two participations in congresses that qualitatively and quantitatively meet the legal requirements for dissertation.

### 2. Short biographical data

Dr. Atanaska Yordanova Cheshmedzhieva was born in 1978.

– 2001 – graduated dental *medicine*, Faculty of Dental Medicine at the Medical University – Sofia.

– 2010 – graduated with a Master's degree in Health Management, Faculty of Public Health, Medical University – Sofia.

– 2010–2015 – Assistant Professor at the Department of Reconstructive and Orthopedics surgery, Military Medical Academy – Sofia.

– 2014 – acquired a specialty in *oral surgery*.

– 2015 – acquired educational and scientific degree "Doctor" in another professional field and doctoral program

– 2015 – Assistant Professor at the Department of Ocular, Ear, Nasal and Throat Diseases and Oral Surgery, Military Medical Academy – Sofia.

– 2004–2010 – worked as a resident physician at the Department of Oral and Maxillofacial Surgery, Department of Reconstructive and Orthopedics Traumatology, Military Medical Academy – Sofia.

– From 09.2017 – she was appointed Head of the Department of Oral Surgery, Military Medical Academy – Sofia.

He is fluent in English. He is a member of BDU.

### **3. Timeliness of the dissertation**

The dissertation work of Dr. Atanaska Cheshmedzhieva treats an interesting and controversial problem for the surgical practice related to the optimization of the healing process after extraction of lower third molars. The extraction of these teeth poses a risk of various postoperative and intraoperative complications and the aim of clinicians is not only to atraumatic work, but also to stimulate the healing process and a lighter and shorter recovery period. Odontectomy of lower third molar is a relatively common procedure in young people on various indications and their rapid recovery and prevention of possible complications by applying PRP would facilitate the full return to work of patients in a short recovery period. The standardization of the way of preparation of autologous platelet concentrates, as well as the objectification of the benefits of its application are essential for clinicians working with regenerative techniques. The dissertation developed by Dr. Atanaska Cheshmedzhieva examines mainly the ways of optimizing and stimulating the healing process, as well as the reservation of the periodontal health of the second molar, which can be compromised after surgery. It is also essential.

### **4. Knowledge of the problem**

Dr. Cheshmedzhieva has become acquainted with a large number of studies on the problem, published in our and foreign specialized literature, most of which are from the last 10 years. The presented literature review is comprehensive and thorough, with a pronounced analytical attitude of the doctoral student to the problem under consideration, which shows her good theoretical background. The problems are clearly and motivated, related to the different ways of obtaining PRP and disagreements in the literature in the absence of a standardized protocol and the conflicting research data.

The parts of PhD work are well structured and provide sufficient information on the issues. This gives me reason to assume that the author knows the problem very well and freely handles the issues treated.

The review concludes with conclusions and critical analysis, which has enabled the PhD student to determine the purpose, an working hypothesis and the tasks of her study clearly and accurately.

### **5. Methodology of the study**

Dr. Cheshmedzhieva aims "To present clinical results in postextraction areas after surgical removal of lower third molar teeth, using new, nationally standardized four protocols for extraction of platelet concentrates from whole fresh autologous blood."

The purpose of the dissertation is clearly and correctly formulated, from which follows the precise setting of the tasks for its implementation.

The following tasks have been performed:

1. To make a summarized analysis of the objective and subjective symptoms associated with the healing process after surgical removal of lower third molar teeth.
2. To analyze the early effects of platelet rich plasma in postextraction wounds after a surgical odonectomy.
3. To evaluate and discuss the influence of platelet concentrate in postextraction dental defects on bone healing.
4. A comparison based on postoperative clinical results after using of the 4 new platelet rich plasma protocols.
5. To determine if there is a protocol of the new generation with absolute biological significance of growth platelet factors on early and later postoperative clinical symptoms after surgical extraction of the third lower molar teeth.
6. To be given an objective assessment of the therapeutic value of the methodology with the application of platelet concentrate in postextraction dental alveoli which is based on the conducted study.
7. To create a diagnostic and therapeutic algorithm among servicemen in which the use of PC after extraction of lower third molar teeth to ensure stimulation and acceleration of healing of the surgical wound and return to daily workload in a shorter time.

The present study was conducted on the territory of the MMA and is prospective and retrospective. Retrospectively, it covers 1278 patients who needed of different surgical procedures in the oral cavity and they were performed in the Department of Oral Surgery of the Military Medical Academy – Sofia for the period: January 2020–March 2023. The prospective study involved a total of 150 patients with extracted inferior wisdom teeth for the period October 2022-March 2023.

Participants were divided into five groups of 30 patients. In the first group, PC is not used, and in the other four groups, a platelet concentrate is applied in postextraction bone defects obtained by four different new methods.

The methods are properly selected to obtain reliable results. Diagnostic, questionnaire, surgical and laboratory methods of examination, the four ways of obtaining and preparing PRP are presented in details, as well as methods for assessing the therapeutic result. The statistical methods are adequately selected.

The design of the study is competently described – the patient selection, the surgery, the PRP placement, the postoperative period assessment and postoperative complications assessment – at 7-th day, on 3-th and 6-th months.

## **6. Characterization and evaluation of the dissertation**

All results are presented in details and analyzed for each of the tasks assigned separately. The discussion and conclusion are thorough, critical, justified by data on the results achieved and supported by the opinions of other contemporary researchers who show an exhaustive clinical judgment, analytical style and objective personal interpretation of the PhD student.

The dissertation work is well illustrated with pictures and ends with conclusions based on the analysis of the results, discussion and generalizations.

The conclusions are clearly formulated and correspond to the tasks set:

1. The using of the PRP in bone defects of the jaws can be applied in addition to some of the standard surgical methods in oral surgery, the most common of which is surgical extraction of the lower third molar tooth.

2. The use of PC in postextraction defects of the lower wisdom tooth stimulates and optimizes the bone and soft tissue healing process.

3. We found a healing and prophylactic effect of PC after the comparative analyses in the five groups we studied,

4. The existing literature data on the clinical results of PC were confirmed, depending on the way they are obtained – the numerous protocols for the extraction of PRP lead to different consequences on healing processes, some of which have almost no clinical significance.

5. The 4 methods used by us for the extraction of PC (Ivanova et al.) are the subject of previous scientific and practical work, where the obtained biological substrates – the amount of formed elements and main acting proteins (PDGF-AB, TGF-beta1, etc.) have been analyzed in detail, depending on the required clinical application.

6. Our clinical results, depending on the 4 protocols used to obtain PRP, confirm the differences between them and show which of them are preferable in the surgical removal of inferior wisdom teeth.

7. The application of PC improves the comfort of the patient in the early postoperative period, up to 7 days after surgery, as well as prevents the occurrence of postsurgical complications. The prevention is due to the fact that PRP is a physiological antibiotic – pH 6.6.

8. PC prevents the occurrence and progression of late postoperative complications associated with pathology of the second lower molar.

9. Patients with PRP report faster local and general recovery postoperatively, associated with timely return to their normal routine duties, especially when it comes to military aviators from the structures of the Air Force of the Republic of Bulgaria.

10. The methodology for extraction and use of PRP is safe and effective (the extraction of autologous PC was realized by medical professionals available in our structure in a hospital hospital) It is possible to be used within an 8-hour duration of the surgical intervention due to the vitality of the activated platelets for this period of time.

11. The financial analysis of PRP is in favor of the patient.

12. The methodology using extracted autogenic PC in lower third molar surgery does not require a prolonged hospital stay and does not prolong the time of the operative activity due to its preliminary preparation.

The results and conclusions drawn in this study show that autologous PRP products can be successfully used to improve bone wound healing and prevent possible complications after third molar surgery with minimal financial resources.

### **7. Contributions and significance of dissertation**

PRP products are gaining increasing popularity and the current study shows that autologous platelet rich plasma containing growth factors which are applied directly into the bone wound. It can be successfully used to achieve a rapid and adequate healing process.

The contributions of this dissertation are significant for modern science and clinical practice:

#### **Of original character**

1. For the first time in Bulgaria, at the Military Medical Academy, a proposal for an avantgarde algorithm of behavior has been prepared for pilots of military aviation who need surgical extraction of a lower third molar tooth and adding into the postextraction defect an autologous PRP. The main objective is quickly and fully recovering to be ready earlier for their official commitments in the flight space of the Republic of Bulgaria.

#### **Of an applied nature**

2. Postoperative symptoms that are related to the performance of daily activities according to job descriptions were analyzed among servicemen after third molar surgery.

3. The necessary optimization measures are derived. It is connected with a stimulation of the bone healing process after surgical extraction of inferior wisdom teeth by using of autologous platelet concentrates.

4. An algorithm of behavior has been created in the Department of Oral Surgery at the Military Medical Academy, Sofia - We use PRP protocol 3 and 4 (Ivanova et al) among servicemen after third molar surgery in postextraction defects.

#### **Of a confirmatory nature**

5. The stimulating effect of pC in terms of the early recovery period after surgery of the lower wisdom tooth has been proven, ensuring timely quality daily life of patients.

6. Optimized bone regeneration was established in the surgical wound and prevention of subsequent pathology in the second lower molar with PRP 3 monts postoperately.

7. It has been confirmed that clinical postoperative results in lower wisdom tooth surgery correlate with the technique of obtaining platelet concentrate, that is, there is a direct dependence on the quantity, concentration of cellular components and acting proteins in them.

8. It has been confirmed that the yield of platelet enriched plasma is reliable using manual methods with a standard small laboratory centrifuge, without the aid of closed commercial kits. It makes the methodology easily feasible and reliable under standard conditions even in the outpatient dental surgical practice.

#### **8. Personal participation of the PhD student**

I accept that the conducted examinations and observations of patients and the resulting conclusions and contributions to the dissertation are the personal work of Dr. Cheshmedzhieva.

#### **9. Autoreferat**

The autoreferat fully corresponds to the content of the dissertation, accurately reflects the accents and is developed in accordance with the requirements of the LDASRB and the regulatory framework of MU – Varna.

The provided to me set of materials related to the dissertation is complete and is in accordance with the LDASRB and its Implementing Regulations, as well as with the Rules of MU – Varna.

#### **Conclusion**

The problem selected and developed by Dr. Atanaska Cheshmedzhieva is relevant to modern medical science and practice. Dr. Cheshmedzhieva knows modern specialized literature and **demonstrates** qualities and skills for independent scientific research. The scientific development is well structured, with properly selected methods and reliable results. The dissertation is proof that the dissertation has exhaustive theoretical knowledge and professional

skills in the scientific specialty of *oral surgery* and competencies for independent and co-authorship conducting scientific research. Based on the study and the results obtained, the author proposes an algorithm for predictability of success in an operating procedure – extraction of the third lower molar. Analytical consideration and discussion of the different methodologies for the preparation of PRP is important for the creation of an established methodology for a rapid regenerative process. The necessary measures for optimization and stimulation of the bone healing process after surgical extraction of inferior wisdom teeth by using autologous platelet concentrates are outlined. The complications and periodontal health of the second molar are also prevented. The methodology has a low financial value. The short and uncomplicated healing process after third molar surgery allows quick return of patients to their working environment and minimal impact on their quality of life.

The dissertation work contains original and confirmatory contributions. The data from the results that are obtained and their interpretation, as well as the submitted publications related to them. I accept all as a personal work of the author.

The research meets the criteria for dissertation and complies with the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria (LDASRB) and the specific requirements adopted in connection with the Regulations for the Implementation of the Law on Implementation of the Law on Dissertation and the Rules of the Medical University – Varna.

**In conclusion:** I give a positive assessment of the dissertation on a topic "**Clinical results of the application of platelet concentrates in postextraction areas using new protocols for the extraction of platelet rich plasma**" and will vote "**YES**" Dr. Atanaska Yordanova Cheshmedzhieva to award the educational and scientific degree "**Doctor**" in the scientific specialty "**Surgical dentistry**".

Sofia, 05.08.2023

Prepared the review:

  
(Assoc. Prof. Dr. Elitsa Deliverska, PhD)

modern, minimally invasive methods, offering maximum comfort for the patient and creating favorable conditions for implant treatment. After an analytical assessment and discussion on different methods for the preservation of post-extraction sockets, guidelines are given for their correct selection in each clinical case and for achieving minimal volume changes of the bone - especially in the vertical direction. Preservation of tissues immediately after tooth extraction using the described methods can eliminate the need for additional surgical stages and/or augmentation procedures before placing a dental implant and can be successfully applied in daily clinical practice with minimal invasiveness and lower financial costs.

The dissertation contains original and confirmatory contributions, and I consider the data from the obtained results and their interpretation, as well as the presented publications related to it, to be the personal work of the author. Dr. Yotsova is aware of modern specialized literature and demonstrates qualities and skills for independent conducting of scientific research.

The research meets the criteria for a dissertation as well as the requirements of the Law for the Development of the Academic Staff of the Republic of Bulgaria, the Regulations for its implementation, and the Regulations of MU-Varna.

**In conclusion:** I give a positive assessment of the dissertation on the topic "Ridge Preservation Using Guided Regeneration, Free Gingival Grafts, and Platelet-rich Plasma" and I give an affirmative vote to Dr. Ralitsa Vladimirova Yotsova to obtain the educational and scientific degree "Doctor" in the scientific specialty "Oral Surgery".

Sofia, 05.08.2023

Reviewer:

  
(Assoc. Prof. Elitsa Deliverska, DMD, PhD)

... for the first time, a comparative analysis of the following three ridge preservation methods was performed: with an application of PTFE membranes, with a combination of PTFE membranes and PRP, and with free full-thickness gingival grafts.

Contributions original for the country

5. For the first time in our country, non-porous PTFE membranes were applied as a method for ridge preservation.

6. For the first time in our country, full-thickness gingival grafts were applied as a method for ridge preservation.

7. For the first time in the country, the influence of ridge preservation methods on the change in the height of the buccal and palatal/lingual bone plate was investigated.

8. For the first time in our country, the influence of the width of the bone plates on the amount of their vertical resorption was investigated.

9. For the first time in the country, the role of the type of jaw, the area of the dentition, the diagnosis, and smoking status on the vertical resorption of the socket walls with/without the application of RP was investigated.

Confirmatory contributions

1. We confirmed that ridge preservation methods could successfully reduce vertical post-extraction resorption of the socket walls compared to those left on spontaneous healing

2. We confirmed that the application of non-porous PTFE membranes could reduce the post-extraction vertical resorption of the socket walls.

3. We confirmed that the application of full-thickness gingival grafts could reduce the post-extraction vertical resorption of the socket walls.

4. We confirmed that smoking did not affect the amount of vertical resorption of the socket walls.

#### **8. Personal participation of the doctoral student**

The conducted research and observations of patients and the resulting conclusions and contributions to the dissertation are the personal work of Dr. Yotsova.

#### **9. Dissertation Summary**

The dissertation summary corresponds completely to the content of the dissertation, accurately presents its emphasis, and is developed by the requirements of the Law for the Development of the Academic Staff of the Republic of Bulgaria and the Regulations of MU-Varna.

The provided set of materials for the dissertation is complete and corresponds to the Law for the Development of the Academic Staff of the Republic of Bulgaria, the Regulations for its implementation, and the Regulations of MU-Varna.

Critical note: The term "preservation of the alveolar ridge" or "preservation of the alveolar process of the jaw" should be used instead of "ridge preservation".

#### **Conclusion**

The dissertation topic "Ridge Preservation Using Guided Regeneration, Free Gingival Grafts, and Platelet-rich Plasma" selected by Dr. Ralitsa Vladimirova Yotsova observes up-to-date and interesting problems in the oral surgical practice. The scientific work is well-structured, with properly selected methods, reliable results, and theoretical and practical contributions in dentistry. The research is up-to-date, considering the continuous search for



The dissertation work is well-illustrated with photographic material and ends with conclusions based on the analysis of the results, the discussion, and the summary.

Numerous important for clinical practice conclusions have been made, namely:

1. The application of the considered ridge preservation methods (with non-porous PTFE membranes; with non-porous PTFE membranes and PRP; with free full-layer gingival grafts) reduced the vertical resorption of the buccal and palatal bone plates.

2. The three applied methods gave similar results, but the methods based on guided regeneration (with non-porous PTFE membranes with/without PRP) were superior to the application of free gingival grafts in terms of preserving the vertical dimensions of the walls.

3. Platelet-rich plasma did not improve the results achieved with non-porous PTFE membranes in terms of preserving the vertical dimensions of both bone plates.

4. Ridge preservation procedures could reduce the risk of vertical loss  $> 2$  mm in both bone plates of the sockets.

5. The behavior after extraction – with or without ridge preservation is a determining factor for vertical bone resorption.

6. The width of the buccal bone plate affects the amount of its vertical resorption, but its influence is much less significant than the behavior after extraction (with/without ridge preservation).

7. Ridge preservation methods could significantly compensate for the resorption of thin socket walls, but not completely neutralize the influence of the width as a factor.

8. The width of the buccal plate is greater in the lower jaw compared to the upper jaw, and in the molar region compared to the premolar area, but with no statistically significant difference between them.

9. There is no strong evidence that the considered local and systemic factors (jaw, area of the dentition – premolar/molar, diagnosis, and smoking status) influence the vertical resorption of the alveolar crest over a period of 3 months after extraction.

The results and conclusions drawn in the current study demonstrate that the methods discussed successfully reduce the amount of vertical post-extraction alveolar ridge resorption, which is the most difficult to augment with standard GBR procedures.

## **7. Contributions and significance of the dissertation**

The conclusions and contributions of the dissertation logically follow the results of the precisely conducted research and demonstrate an undoubted significance for contemporary clinical practice with an original and confirmatory character.

### **Original contributions**

1. We proposed our original methodology for measuring the height of the bone plates of the socket relative to the maxillary sinus and the mandibular canal on cone-beam computed tomography.

2. For the first time, the simultaneous use of non-porous PTFE membranes and platelet-rich plasma as a method for guided regeneration in post-extraction sockets was investigated.

3. We proved that the application of PRP did not improve the results of guided regeneration with non-porous PTFE membranes regarding the preservation of the vertical dimensions of both buccal and palatal/lingual socket plates.

the implementation of the main goal and tasks and confirmation of the working hypothesis is completely sufficient for the development of the dissertation.

The study included 80 patients aged between 26 and 65 years, divided into 3 age groups according to the WHO classification. The selection of patients was carried out after a detailed analysis and evaluation of the indications for the treatment, as well as the establishment of the absence of general and local contraindications with clearly defined criteria for the inclusion and exclusion of the study participants.

The teeth in the present study were divided into 2 groups according to their primary diagnosis: chronic periodontal disease and periapical lesions (periapical granulomas, periapical cysts, and periapical lesions of diffuse origin). A total of 80 teeth were extracted - 34 premolars and 46 molars. Patients were allocated to four groups by the method of randomization (lottery method). The first group included post-extraction sites where ridge preservation was performed using non-porous dense PTFE membranes while in the second group, a combination of these membranes and PRP was used. In the third group, RP with free gingival grafts was performed. In the fourth group, no RP procedures were applied and it served as a control. Radiological and measuring methods are clearly defined - on the day of extraction and 3 months after. Surgical techniques are described in detail and are well-illustrated. Statistical methods are adequately selected.

For the implementation of task 1, the results after the application of the non-porous PTFE membranes as a method of guided regeneration in the post-extraction sockets in 20 teeth of a total of 20 patients aged 26 to 65 years were analyzed.

For task 2, CBCT evaluation of the results after the application of nonporous PTFE membranes combined with PRP as a method for guided regeneration in post-extraction sockets was performed. The experimental group included 20 patients, aged between 29 and 65 years.

For the implementation of task 3, the results after the application of full-thickness free gingival grafts as a method of alveolar ridge preservation after tooth extraction were observed. For this purpose, the cone beam tomography images, performed on the day of the extractions and 3 months after them, were compared. A total of 20 post-extraction sockets (in the premolar and molar areas of the dentition) in 20 patients aged 30 to 61 years were included in this group.

In task 4 a CBCT analysis of the post-extraction bone changes in 20 post-extraction sockets, undergoing unassisted healing without ridge preservation procedures, was performed.

For task 5, the results from the CBCT images in all 4 experimental groups were compared. This group included a total of 80 post-extraction sockets in the posterior regions of the dentition in 80 patients (38 males and 42 females) aged 26 to 65 years.

## **6. Characteristics and evaluation of the dissertation**

The results are comprehensively and correctly described, analyzed, and interpreted.

The good visualization and the competent approach of the doctoral student in the interpretation of the obtained data make an excellent impression.

The discussion of the results and the conclusion demonstrate sound clinical judgment, analytical style, and objective personal interpretation.

- (buccal and palatal/lingual) measured immediately after extraction and the quantitative change in their height after 3 months.
2. To investigate the application of non-porous dense PTFE membranes in combination with platelet-rich plasma for guided regeneration in the post-extraction sockets of the posterior teeth (premolars and molars).
    - 2.1. To perform a quantitative evaluation of the bone in the post-extraction sites by measuring the height and width of the alveolar crest immediately after the extraction and the height of the alveolar crest three months after the extraction.
    - 2.2. To analyze the relationship between the quantitative change in the height of the bone plates after three months and some factors (group of teeth, maxillary/mandibular teeth, dental diagnosis, smoking status).
    - 2.3. To determine whether the change in height is the same for both bone plates and whether there is a relationship between the width of the bone plates (buccal and palatal/lingual) measured immediately after extraction and the quantitative change in their height after 3 months.
  3. To investigate the influence of autogenous free gingival grafts on bone regeneration in the post-extraction sockets of the posterior teeth (premolars and molars).
    - 3.1. To perform a quantitative evaluation of the bone in the post-extraction sites by measuring the height and width of the alveolar crest immediately after the extraction and the height of the alveolar crest three months after the extraction.
    - 3.2. To analyze the relationship between the quantitative change in the height of the bone plates after three months and some factors (group of teeth, maxillary/mandibular teeth, dental diagnosis, smoking status).
    - 3.3. To determine whether the change in height is the same for both bone plates and whether there is a relationship between the width of the bone plates (buccal and palatal/lingual) measured immediately after extraction and the quantitative change in their height after 3 months.
  4. To investigate bone regeneration in the post-extraction sockets of the posterior teeth (premolars and molars) without the application of any ridge preservation procedures (control group).
    - 4.1. To perform a quantitative evaluation of the bone in the post-extraction sites by measuring the height and width of the alveolar crest immediately after the extraction and the height of the alveolar crest three months after the extraction.
    - 4.2. To analyze the relationship between the quantitative change in the height of the bone plates after three months and some factors (group of teeth, maxillary/mandibular teeth, dental diagnosis, smoking status).
    - 4.3. To determine whether the change in height is the same for both bone plates and whether there is a relationship between the width of the bone plates (buccal and palatal/lingual) measured immediately after extraction and the quantitative change in their height after 3 months.
  5. To evaluate and compare the results from all experimental groups.

The present study was conducted on the territory of the University Medical and Dental Center and the Faculty of Dental Medicine at the Medical University of Varna "Prof. Dr. Paraskev Stoyanov" for the period June 2022 - April 2023. The clinical material selected for

- In 2017 she is a part-time assistant in the Department of Oral Surgery, FDM, MU-Varna, and since 2018 – she is a full-time assistant in the same department.
  - Since 2023 she is enrolled for *specialization in oral surgery*.
  - Since 2023 she is a full-time Ph.D. student in the Department of Oral Surgery.
- She speaks fluent English. Member of the BDA.

### **3. Relevance of the dissertation**

The dissertation of Dr. Ralitsa Yotsova deals with a serious and significant problem for the surgical practice, related to the preservation of the alveolar ridges of the jaws after tooth extraction. Understanding and study of the various preservation techniques are important since these procedures reduce bone resorption and preserve bone volume as well as tissue architectonics. This minimizes the need for additional methods that increase the vertical and horizontal dimensions of the alveolar process following tooth extraction. This procedure, which includes various methods, can provide more favorable conditions for the placement of dental implants, which will ensure good functional and aesthetic results in the long term. In this sense, the topic of the dissertation „Ridge Preservation Using Guided Regeneration, Free Gingival Grafts, and Platelet-rich Plasma” is of great importance for clinical practice in the field of oral surgery.

### **4. Understanding of the problem**

In the present dissertation, Dr. Ralitsa Yotsova demonstrated profound knowledge of the presented topic and skills for conducting independent scientific research.

The exhibition is written in good scientific language. The author has made a detailed and in-depth critical analysis of the literature, specifying the disputable and unsolved issues on the topic. The literature review is highly informative and summarizes the need to clarify some selected methods such as the application of platelet-rich plasma, non-porous polytetrafluoroethylene membrane, and autogenous free gingival grafts in post-extraction sites for alveolar ridge preservation.

This allowed the Ph.D. student to clearly and precisely identify the aim and tasks of her research.

### **5. Research methods**

The realization of the aim, namely - to investigate the influence of platelet-rich plasma, non-porous PTFE barrier membranes, and autogenous free gingival grafts on healing processes in post-extraction sites, has been achieved through the following 5 tasks:

1. To investigate the application of non-porous dense PTFE membranes for guided regeneration in the post-extraction sockets of the posterior teeth (premolars and molars).
  - 1.1. To perform a quantitative evaluation of the bone in the post-extraction sites by measuring the height and width of the alveolar crest immediately after the extraction and the height of the alveolar crest three months after the extraction.
  - 1.2. To analyze the relationship between the quantitative change in the height of the bone plates after three months and some factors (group of teeth, maxillary/mandibular teeth, dental diagnosis, smoking status).
  - 1.3. To determine whether the change in height is the same for both bone plates and whether there is a relationship between the width of the bone plates

**By Assoc. Prof. Elitsa Georgieva Deliverska-Aleksandrova, PhD**  
**Department of DOMFS, FDM, MU-Sofia**  
(member of the scientific jury by order № P-109-307/12.06.2023  
of the Rector of MU-Varna)

**Regarding: Acquisition of the educational and scientific degree “Doctor” in the field of higher education 7. Healthcare and Sports. Professional field 7.2. Dental Medicine. Doctoral program “Oral surgery”**

**On dissertation on the topic: „Ridge Preservation Using Guided Regeneration, Free Gingival Grafts, and Platelet-rich Plasma”**

**Author: Ralitsa Vladimirova Yotsova, DMD – Ph.D. student, full-time educational program in the procedure for obtaining the educational and scientific degree “Ph.D.”, Faculty of Dental Medicine, Medical University - Varna**

**Scientific Supervisor: Prof. Rossen Kolarov, DMD, PhD**

### **1. General presentation**

The present review was prepared by the order of the Rector of MU-Varna № P-109-307/12.06.2023.

The submitted set of materials on print and electronic media is by Art. 44 (3) of the Regulations for the Development of the Academic Staff of MU-Varna.

The dissertation consists of 283 pages and is well-structured, meeting the academic requirements adopted in the country: introduction; literature review; summary and critical analysis; aim and tasks; materials and methods; results and discussion; conclusions; contributions; bibliography and list of articles related to the dissertation; applications.

The dissertation is illustrated by 133 tables and 123 figures. The bibliography cites 561 literature sources, 4 of which are in Cyrillic and 557 in Latin.

The Ph.D. candidate has submitted 3 scientific publications related to the dissertation, in which she is the first author. They correspond in quantity and quality to the legal requirements for a dissertation.

### **2. Brief biographical data**

– 10.2017 – graduated from the Medical University of Varna “Prof. Dr. Paraksev Stoyanov” with a Master’s degree “Doctor in Dental Medicine”.

– 2017 – a part-time assistant in the Department of “Oral and Maxillofacial Surgery”, since 2018 she is a full-time assistant in the same department.

– 01.2020 – a Ph.D. student in a full-time doctoral program „Oral surgery“.

– 06.2020 – enrolled for specialization in oral surgery.

Dr. Ralitsa Vladimirova Yotsova was born in 1992 in the town of Omurtag.

– 2011 – graduated from the First Language School - Varna.

– 2017 – Master’s degree “Doctor in Dental Medicine”, Faculty of Dental Medicine, Medical University “Prof. Dr. Paraskev Stoyanov”– Varna, with excellence.