

## OPINION



**From Prof. Dr Jeni Staikova Nikolova, DSc, department “Preventive medicine”  
Faculty of Public Health “prof. dr Cekomir Vodenicharov, DSc”, MU – Sofia**

About a dissertation for the awarding of scientific and education degree “Doctor”

**Professional field:** 7.2. Dental medicine

**Doctoral programme:** Dental Imaging Diagnostics

**Author:** Dr Tamara Petrova Petkova

Form of doctoral studies: **full-time training**

Department of **Diagnostic Imaging, Dental Allergology and Physiotherapy** of Faculty of  
Dental Medicine at MU – Plovdiv

**Topic: STUDY OF THE DIAGNOSTIC POSSIBILITIES OF MODERN IMAGING  
METHODS IN PATIENTS WITH CONGENITAL CLEFT LIPS AND PALATES**

**Scientific supervisors:** Assoc. Prof. Nikolai Sirakov, PhD and Prof. Iliyan Doikov, PhD

The review was prepared based on the order of the Rector of MU – Plovdiv №R-476/05.02.2024, in connection with the procedure for the defense of the above-mentioned dissertation work in the scientific specialty Dental Imaging Diagnostics and in implementation of the LDASB, the Regulations for the implementation of the LDASB and the Regulations for the organization and operation of the Medical University of Plovdiv.

### **1. General presentation of the procedure and the candidate**

Dr. Tamara Petkova was born on February 27, 1984 in the city of Plovdiv. She completed her average education at the Mathematical High School "Acad. Kiril Popov" in Plovdiv. In 2009, she obtained a master's degree in dentistry at the Faculty of Dental Medicine of the Medical University of Plovdiv. PhD student in the discipline of Dental Imaging Diagnostics at the Department of Diagnostic Imaging, Dental Allergology and Physiotherapy at the Faculty of Dental Medicine at the Medical University in Plovdiv.

The provided materials on paper and electronic media are completed in accordance with the requirements of the Rules of the MU-Plovdiv.

The dissertation contains 170 standard pages, 63 tables, 91 figures and 38 appendices. The literature survey includes 168 sources, of which 8 are in Cyrillic and 160 are in Latin. The PhD student has submitted 3 publications in Bulgarian magazines, participated in 3 scientific forums.

### **2. Actuality of the topic**

Of all congenital anomalies, 15% constitute congenital clefts of the lip and palate, which are the most common craniofacial malformations. Since their etiology is complex and multi-component, including, in addition to genetic factors, behavioral risk factors and the environment, for their correct diagnosis and treatment, the most appropriate imaging method must be chosen. Segmental intraoral, occlusal and panoramic radiographs are often used for diagnosis. They are of limited interpretation due to projection deformation, two-dimensionality of the image and superimposition of many

structures in the maxillary region. Cone-beam computed tomography (CBCT) is an advanced imaging technology that is based on computed tomography (CT), especially for visualizing craniofacial bones. One of the key advantages of CBCT over 2D radiography is its ability to provide 3D volumetric, surface, and sectional information about craniofacial structures. CBCT is a widely used method for oral and maxillofacial diagnosis and treatment planning. Compared to conventional CT, CBCT has indisputable advantages such as lower effective dose of ionizing radiation, shorter exposure time, lower cost, easy access. An indispensable part of the activity of the modern dental practitioner is to acquaint the patient with the various methods of examining his disease, not least their value. I am not aware of any research in this regard so far and this question is definitely of interest. The problems discussed in the dissertation correspond to the modern view on the diagnosis of the considered anomaly. The presented topic corresponds to scientific interests. In accordance with the topic, a clearly formulated aim and specifically defined 6 tasks are identified. In this sense, the choice of the topic of the dissertation work is current and dissertationable.

### **3. Relevance of the problem**

Dr. Petkova is very familiar with the problem, making a thorough and sufficiently literature survey.

### **4. Research methodology**

The methodology of the research is skillfully selected for the fulfillment of the aim and the set tasks.

In the first part of the study, 222 patients with anomalies of the upper lip and palate were included, to whom the cone-beam computed tomography method was applied. The study was conducted with Planmeca Pro Max 3D; image size Ø 8.0 x 5.0 cm (401 x 401 x 251); voxel size (µm) 200; kV 90; mA 6; DAP (mGy x cm<sup>2</sup>) 407,7; slice thickness 0,6 mm.

In the second part of the dissertation, a "case-control study" was conducted on a part (90 patients) of the main sample (222 cases).

The "cases" are those with bone grafting - 54 patients.

The "controls" were without bone grafting and were age-matched - 36 patients.

### **5. Characterization and evaluation of the dissertation work and contributions**

The dissertation work is properly structured, in a volume of 170 pages, illustrated with 91 figures, 63 tables and 38 appendices.

The introduction clearly shows the relevance of the topic and defines the aim of the study.

In the literature survey, both the similarity of cone-beam computed tomography and congenital clefts of the lips and palate are discussed in detail. The analysis carried out brings out the aim and tasks of the scientific study, which are clearly formulated in the Second Chapter.

In order to achieve the formulated aim "**STUDY OF THE DIAGNOSTIC POSSIBILITIES OF MODERN IMAGING METHODS IN PATIENTS WITH CONGENITAL CLEFT LIPS AND PALATES**" the PhD student set herself 6 tasks, the implementation of which realizes the aim of the development. They are as follows:

1. To investigate the diagnostic possibilities of CBCT in congenital cleft lip and palate and to analyze the factors influencing its application for preoperative evaluation.
2. To determine whether there are gender differences and dependencies with indicators associated with congenital clefts of the lip and palate.
3. To analyze the relationships between indicators characterizing the clinic of congenital clefts and variables associated with bone grafting.
4. To investigate the prevalence of cone beam computed tomography as a method for immediate assessment of congenital clefts of the lip and palate.
5. To establish parents' awareness of the advantages and disadvantages of the method and its popularity among them.
6. To develop a diagnostic-therapeutic algorithm for congenital clefts of the lips and palate, including the application of CBCT.

In her studies, the PhD student focuses on the assessment of the influence of defects in the bone and soft tissues, as well as dental anomalies (supernumerary, missing or misshapen teeth), on the eruption of the permanent maxillary canines; on the comparative analysis between the permanent maxillary canines on the side without defect and the side with a cleft and on the determination of the position of the canine relative to the adjacent lateral incisor.

The analysis of the results shows Dr. Petkova's ability for in-depth knowledge and excellent analysis of the data obtained. The PhD student well illustrates the obtained results with tables and figures. The conclusions are precisely formulated, reflecting the analysis of the results.

The dissertation outlines the following contributions, which are precisely cited, according to the results of the study:

1. An optimally balanced algorithm is offered for diagnosis, tracking the dynamics of the disease, reporting the therapeutic result after bone grafting, analysis and description of patients with congenital clefts of the lips and palate.

2. The level of application of the cone-beam computed tomography method in patients with congenital clefts of the lips and palate is analyzed.

3. The factors affecting the application of the cone-beam computed tomography method in patients with congenital clefts of the lips and palate are analyzed.

4. The level of awareness of the parents of patients with CLP and their attitude towards the cone-beam computed tomography method are studied.

5. The types of congenital clefts of the lips and palate are systematized, the features and problems in the diagnosis of each of them are described.

Undoubtedly, the use of the results of the studies in the dissertation work should be implemented in the dental practice and in their various aspects would contribute to the optimal imaging diagnosis of the disease and its treatment.

The topic of the dissertation work is dissertationable through its relevance and the presented results.

#### 6. **Assessment of the PhD student's publications and personal contributions**

The presented scientific publications are according to the requirements and are significant, due to the topicality of the topic.

#### 7. **Author's summary**

The abstract has been prepared in accordance with the requirements of the LDASRB and the regulations of the MU – Plovdiv and accurately reflects the results obtained.

### CONCLUSION

Dissertation work of Dr. Tamara Petrova Petkova on the topic " **STUDY OF THE DIANOSTIC POSSIBILITIES OF MODERN IMAGING METHODS IN PATIENTS WITH CONGENITAL CLEFT LIPS AND PALATES** " is in-depth with clearly formulated aim and taska, excellently presented results of a complex study with original scientific contributions.

This current problem of dental imaging diagnostics is part of the multidisciplinary approach of the studied group of patients.

**In connection with the above, I give a positive vote of the dissertation submitted to me for an opinion, and I propose to the honorable scientific jury to award the educational and scientific degree "Doctor" to Dr. Tamara Petrova Petkova in professional field: 7.2 Dental medicine, doctoral program: Dental imaging diagnostics .**

18.03.2024

Opinion prepared by: .....  
(From Prof. Dr Jeni Staikova Nikolova, DSc)

Заличено на основание  
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