**REVIEW**

**by Prof. Elitsa Georgieva Deliverska-Alexandrova, DMD, PhD**

External member of the scientific jury (order No. P-109-383/19.09.2025 of the Rector of the Medical University "Prof. Dr. Paraskev Stoyanov", Varna, Bulgaria

**Regarding:** *procedure for acquiring the degree of Doctor of Sciences*

*Field of Higher Education: 7. Health and Sports*

*Professional field: 7.1. Medicine, Specialty Surgery*

*Department of General and Operative Surgery at the Medical University of Varna.*

On a dissertation on the topic: **"Lymph nodes in maxillofacial surgery - normal and most common diseases"**

**Author: Assoc. Prof. Yanko Georgiev Yankov, MD, PhD**

**General presentation of the procedure and characteristics of the dissertation work**

This review was prepared based on an order of the Rector of the Medical University of Varna No. P-109-383/19.09.2025

The presented set of materials on paper and electronic media are in accordance with Art. 44 (3) of the Regulations for the Development of Academic Staff at MU - Varna.

The structure of the work meets the academic requirements: introduction and overview, goals and objectives, material and methods, results, discussion, conclusions and contributions, bibliography. There are 10 publications presented in connection with the dissertation work.

The dissertation work contains 222 pages and is illustrated with 93 tables, 41 figures and 9 images. The bibliographic reference includes 428 literary sources in English. Discussed, accepted and is directed for defense before a scientific jury by Department Council No. 10, Department of General and Operative Surgery of the Faculty of Medicine at the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna, on 09.09.2025

**Brief biographical data about the author**

Assoc. Prof. Dr. Yanko Georgiev Yankov, Doctor, was born on 17.04.1989 in the city of Shumen, Bulgaria

– 2014 – graduated from Medicine at the Faculty of Medicine of the Medical University of Varna, with excellent (6.00) grades and received the Golden Hippocrates Award and the First Degree Award from the Bulgarian Medical Union.

– 2016 – obtained a Master's degree in *Health Management.*

– 2020 – obtained a specialty in *Maxillofacial Surgery*.

– 2021–2022 – doctoral student in independent training at the Department of General and Operative Surgery at the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna.

– 2023 – successfully defended a dissertation on the topic: "Procalcitonin and delta neutrophil index levels in the surgery of head and neck inflammatory diseases".

– 2015 and up to now – physician at the Clinic of Maxillofacial Surgery at the University Hospital "St. Marina", Varna, Bulgaria.

– February 2019 – October 2019 – *part-time assistant*, specialty "Oral and Maxillofacial Surgery", at the Department of General and Operative Surgery and the Department of Oral Surgery at the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna.

– October 2019 – July 2023 – *full-time assistant* in the specialty "Maxillofacial Surgery" at the Department of General and Operative Surgery of the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna.

– 2023 – academic position *Chief Assistant* in the Department of General and Operative Surgery of the Medical University University "Prof. Dr. Paraskev Stoyanov" - Varna.

- 2024 - academic position *Associate Professor*.

Assoc. Prof. Yanko Yankov, MD, PhD leads classes in maxillofacial surgery for fourth and fifth year dental and medical students (Bulgarian and English-language training) at Medical University "Prof. Dr. Paraskev Stoyanov" - Varna.

He speaks English at a very good level.

He is a member of the Bulgarian Medical Union.

**Relevance of the topic and appropriateness of the set goals and tasks**

A dissertation work has been submitted for review, dedicated to the lymph nodes of the head and neck in the context of maxillofacial surgery - their normal anatomy, topography and most common diseases, with an emphasis on clinical significance, diagnostics and various approaches to therapeutic behavior. A current, fundamental and important problem for surgical practice is examined. The presented literature review is comprehensive and in-depth, written in a good scientific style, with a emphasized analytical attitude of the dissertationist to the problem under consideration, which indicates his good theoretical preparation. The challenges associated with diagnostics and clinical behavior are explained clearly and motivatedly.

The formulated **goals** are clearly defined:

1. To carry out a modern and detailed cytological, histological, anatomical-topographical and anatomical-oncological description of the regional lymph nodes in the head and neck area, with an emphasis on their importance in maxillofacial surgery.

2. To analyze the diseases of the lymph nodes in the maxillofacial region in patients hospitalized in the Clinic of Maxillofacial Surgery, with distribution by gender, age and clinical diagnosis.

3. To classify the diseases of the lymph nodes into main diagnostic groups and to study their frequency and characteristics in clinical practice.

4. To study the etiological bacterial spectrum in patients with abscesses and phlegmons originating from lymph nodes of the head and neck.

5. To study antibiotic resistance in patients with infectious diseases of the lymph nodes, with analysis of the relationship between gender, age and type of the isolated microorganism.

To achieve the specified **goal**, the dissertation candidate sets the following **14 tasks**:

1. To conduct a systematic review of the modern scientific literature concerning the cytological, histological and anatomical structure of the lymph nodes in the head and neck region.

2. To describe the topographic location of the lymph nodes in the head and neck region and to systematize their distribution by anatomical levels in view of their clinical significance.

3. To analyze the anatomical-oncological role of the lymph nodes as regional structures in malignant neoplasms in the maxillofacial region.

4. To create a retrospective database of patients with lymph node diseases who have passed through the Clinic of Maxillofacial Surgery for a 10-year period.

5. To perform a statistical analysis of the frequency of lymph node diseases in the maxillofacial region depending on the age, sex and clinical diagnosis of the patients.

6. To perform a detailed clinical analysis of representative cases from each main diagnostic group.

7. To prepare a diagnostic classification of diseases of the lymph nodes in the maxillofacial region by etiology - nonspecific, specific, reactive and chronic lymphadenitis, lymphoproliferative and metastatic diseases.

8. To study the distribution of patients according to the formed diagnostic groups and their frequency.

9. To compare the clinical features of each group in terms of gender, age and localization of the involved lymph nodes.

10. To determine and analyze the microbiological spectrum in patients with purulent-inflammatory processes originating from the lymph nodes of the head and neck.

11. To identify the main bacterial causative agents of lymphogenic abscesses and phlegmons and to determine their frequency.

12. To process the results of the antibiograms of patients with infectious diseases of the lymph nodes included in the study, and to assess the degree of antibiotic resistance to the main groups of antimicrobial agents.

13. To analyze the relationships between antibiotic resistance, gender, age of patients and the type of isolated microorganisms.

14. To offer substantiated recommendations for empirical selection of antimicrobial treatment in infectious diseases of the lymph nodes in the maxillofacial region.

The study is a retrospective and descriptive analysis of clinical, microbiological, imaging and histological data from patients with diseases of the lymph nodes of the head and neck.

**Brief content and methodology**

The study is retrospective and includes all patients with lymphadenopathy hospitalized in the Clinic of Maxillofacial Surgery of the University Hospital "St. Marina", Varna, Bulgaria in the period 01.01.2015–31.12.2024 (n=563 out of a total of 8325 hospitalizations; 6.76%). The study was approved by the Research Ethics Committee at the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna, in 2025.

The total number of patients who underwent the clinic was 8325: 4756 men and 3569 women, of all patients who underwent 6.76% had lymph node diseases.

The cases were grouped into nine nosological categories (including actinomycosis, sarcoidosis, tuberculosis, felinosis, metastatic involvement, lymphoproliferative diseases, chronic reactive lymphadenitis, abscesses/phlegmons, acute lymphadenitis). The patients were analyzed by sex, age, type of treatment and antibiotic resistance.

Histopathological data were made on the basis of biopsy and surgical material; morphological features and oncological parameters were described, including resection lines and T-stage in neoplasia.

In purulent-inflammatory diseases, standardized microbiological processing and antibiotic susceptibility testing according to EUCAST/CLSI were performed.

**Main results (selection)**

The results section presents quantitative data on frequency by groups, distribution by age and sex and therapeutic behavior. For example, the highest average annual rates were found in lymphoproliferative diseases and cervical lymph node metastases, while the lowest were found in rare infections (felinosis, tuberculosis).

Subgroups of lymphomas (including patients <18 years) were analyzed in detail.

The microbiological section examines dominant aerobic and anaerobic pathogens (including viridans group Streptococcus, Fusobacterium, Prevotella, etc.) and outlines trends for increased resistance to macrolides and clindamycin - an argument for routine antibiogram-based treatment.

The oncological section emphasizes the clinical importance of metastatic lymph node involvement for staging and complex therapeutic planning in head and neck tumors.

**Analytical notes and scientific interpretation**

The dissertation is distinguished by a comprehensive clinicopathological and microbiological analysis of patients with lymphadenopathy in the head and neck area in the Department of Maxillofacial Surgery. The combination of clinical, histopathological, imaging

and microbiological methods, combined through the prism of clinical behavior and treatment, provides a reliable basis for making therapeutic decisions and for the formation of empirical protocols based on antibiograms. Strict adherence to EUCAST/CLSI increases the quality and applicability of the results.

**Contributions and significance of the work for science and practice**

The contributions of the present dissertation are significant for modern science and clinical practice, and are formulated as follows:

1. A complete cytological, histological and anatomical-topographic analysis of the regional lymph nodes in the head and neck area was performed, with an emphasis on their importance in maxillofacial surgery.

2. A detailed analysis of the demographic distribution of patients with lymph node diseases in the maxillofacial region by age and gender was performed.

3. For the first time in Bulgaria, a large and detailed comparison between surgical and conservative treatment in patients with lymphadenopathy in the maxillofacial region was made, which reflects the significant predominance of surgical interventions.

4. The etiological bacterial spectrum of acute purulent lymphadenitis of the head and neck and the abscesses and phlegmons arising from them was described.

5. An assessment of the antibiotic resistance of the isolated strains in purulent lymphadenitis of the head and neck was made, which allows for a more precise choice of antibiotic treatment.

6. Recommendations for clinical practice in the treatment of patients with metastatic involvement of the lymph nodes in the neck were prepared.

7. High antibiotic sensitivity of intestinal bacteria and contrasting partial to high resistance of staphylococci to a number of antibacterial agents in purulent infections of the lymph nodes in the maxillofacial region have been proven, which may assist in the selection of their empirical antibacterial treatment.

8. Gender-specific antibiotic sensitivity has been proven in acute purulent lymphadenitis of the head and neck, against which the antibiotic piperacillin is three times more effective in men than in women.

9. Recommendations have been formulated for optimizing antibiotic therapy in acute purulent lymphadenitis in the maxillofacial region, based on established patterns in gender-specific resistance - men are more sensitive to most antibiotics, while women require more precise selection.

This is the first retrospective cohort study in our country that systematizes the incidence, clinical profile and therapeutic behavior in nine main nosological groups of lymphatic diseases in the maxillofacial region with undoubted practical benefit in terms of realistic planning of resources and behavior in clinical pathways. The creation of a standardized histopathological framework for verification by main diagnoses (including oncological parameters and resection lines) could support multidisciplinary decisions and facilitate diagnosis in the wide range of differential diagnoses. Microbiological verification with an

antibiogram in abscesses and phlegmons, conducted according to EUCAST/CLSI, shows current relevant trends in the resistance of microorganisms (e.g. in the Streptococcus viridans group), and can serve as a basis for forming antibiotic policy in medical institutions, and on a more global scale.

The analysis of epidemiological patterns – structure by age and sex, variability over time and by nosological units can help identify groups with higher risk, which can guide prioritization of diagnosis, treatment and follow-up. The oncological focus on metastatic involvement of the lymph nodes emphasizes its prognostic value and is important in terms of disease staging and treatment selection – multimodal treatment – surgery, radiotherapy and chemotherapy. The educational contribution is expressed in synthesizing and creating a clinically oriented framework – anatomical-topographic characteristics – pathology – laboratory studies (imaging studies, microbiology, serological studies) – diagnostics – treatment, applicable for training of residents and students in oral and maxillofacial surgery and related specialties.

**Assessment of publications related to the dissertation work**

Ten publications related to the dissertation work have been submitted, with Assoc. Prof. Yanko Yankov, MD, PhD, being the first author in eight of them. Five of the publications are in journals with an impact factor.

**Personal participation of the dissertation candidate**

The research and observations of patients conducted and the resulting conclusions and contributions to the dissertation work are the author's personal work.

**Abstract**

The abstract contains 76 pages and has been prepared in accordance with the requirements of the Academic Staff Development Act of the Republic of Bulgaria and the regulations of the Medical University of Varna. It reflects the results achieved in the dissertation.

**Remarks and recommendations**

The dissertation work submitted to me is fully in accordance with the Law on the Development of the Academic Staff of the Republic of Bulgaria and the Regulations for its implementation, as well as with the Regulations of the Medical University of Varna. I have no comments or recommendations.

**Conclusion**

The dissertation work presented is well structured, methodologically sound and clearly oriented towards clinical practice. The results obtained are reliable, interpreted correctly, and

lead to significant theoretical and applied contributions in the field of maxillofacial surgery. Based on this analysis, I give a positive comprehensive assessment of the dissertation work on the topic "Lymph nodes in maxillofacial surgery - normal and most common diseases", and I will vote **"YES"** for **Assoc. Prof. Yanko Georgiev Yankov, MD, PhD**, to acquire the scientific degree **"Doctor of Sciences"** in the scientific specialty **"Surgery"**.

Заличено на основание чл. 5, §1, б. „В“ от Регламент (ЕС) 2016/679

25.10.2025 Signature:

Sofia (Prof. Elitsa Deliverska-Alexandrova, DMD, PhD)