REVIEW

by

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Regular member of the Scientific Jury for the award of the scientific degree "Doctor of Sciences" by Assoc. Prof. Yanko Georgiev Yankov, MD, PhD, appointed by Order No. 109-383/19.09.2025 of the Rector of the Medical University "Prof. Dr. Paraskev Stoyanov", Varna, Bulgaria for the preparation of a review

The defense for the degree of "Doctor of Science" is in the scientific specialty "Surgery", field of higher education "7. Health and Sports", professional field "7.1. Medicine". The author of the dissertation is Assoc. Prof. Yanko Georgiev Yankov, MD, PhD. He is the head of the Clinic of Maxillofacial Surgery at the University Hospital "St. Marina", Varna, Bulgaria and is an associate professor at the Department of General and Operative Surgery of the Faculty of Medicine at the Medical University "Prof. Dr. Paraskev Stoyanov", Varna, Bulgaria.

The set of documents that I received on paper and on a flash drive meets the requirements of the Law on the Development of the Academic Staff of the Republic of Bulgaria, the Regulations for the Implementation 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 "Prof. Dr. Paraskev Stoyanov", Varna, Bulgaria for the acquisition of the scientific degree "Doctor of Sciences" in the scientific specialty "Surgery".

1. Professional biographical profile of Assoc. Prof. Yanko Georgiev Yankov, MD, PhD

Assoc. Prof. Yanko Georgiev Yankov, MD, PhD graduated with a Master's degree in Medicine in 2014 and a Master's degree in Health Management in 2016 at the Medical University "Prof. Dr. Paraskev Stoyanov", Varna, Bulgaria. He has been working at the Clinic of Maxillofacial Surgery at the University Hospital "St. Marina", Varna, Bulgaria since 2015. He obtained a specialty in Maxillofacial Surgery in 2020. From February 2019 to October 2019, he worked as a part-time assistant professor in 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, Bulgaria. In October 2019, he won a competition for a full-time assistant professor in maxillofacial surgery at the same department and began working as such. In 2021 and 2022, he was an independent doctoral student at the Department of General and Operative Surgery, Faculty of Medicine, specialty "Surgery" at the Medical University "Prof. Dr. Paraskev Stoyanov", Varna, Bulgaria and in December 2022, he obtained the educational and scientific degree "doctor of philosophy" (PhD) with the topic of his dissertation "Procalcitonin and delta neutrophil index levels in the

surgery of head and neck inflammatory diseases". In July 2023, he won a competition for chief assistant professor in maxillofacial surgery and was appointed as such in the same department of the Medical University "Prof. Dr. Paraskev Stoyanov", Varna, Bulgaria. Since December 2025, after winning a competition, he has been working as an associate professor of maxillofacial surgery in the same department and teaching lectures and exercises on maxillofacial surgery to medical and dental students in Bulgarian and English. Since March 2025, he has been the head of the Clinic of Maxillofacial Surgery at the University Hospital "St. Marina", Varna, Bulgaria.

2. Scientific profile of Assoc. Prof. Yanko Georgiev Yankov, MD, PhD in connection with the dissertation for the acquisition of the scientific degree "Doctor of Science"

The dissertation for the degree of "Doctor of Science" is on the topic "Lymph nodes in maxillofacial surgery - normal and most common diseases". It has a volume of 222 pages and contains 93 tables, 41 figures, 9 images and a bibliographic reference of 428 literary sources in English. The abstract has a volume of 76 pages and contains 18 tables and 12 figures.

The **goals** set in the dissertation by Assoc. Prof. Yanko Georgiev Yankov, MD, PhD are five in number. He has precisely formulated them and the following:

1. to perform a modern and detailed cytological, histological, anatomical-topographical and anatomical-oncological description of the regional lymph nodes in the head and neck region, 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 an analysis of the relationship between gender, age and type of the isolated microorganism.

To achieve these goals, it sets the following fourteen **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 diseases of the lymph nodes 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 - non-specific, 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 sex, 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 lymphogenous 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 for infectious diseases of the lymph nodes in the maxillofacial region.

In order to achieve the goals and fulfill the tasks assigned to them, Assoc. Prof. Yanko Georgiev Yankov, MD, PhD conducted a detailed and detailed retrospective analysis of patients with diseases of the lymph nodes of the head and neck, who from 01.01.2015 to 31.12.2024 were hospitalized in the Clinic of Maxillofacial Surgery at the University Multi-profile Hospital for Active Treatment "St. Marina" Varna, Bulgaria. Thus, he examined a total of 563 patients (**materials**), whom he grouped into nine separate nosological groups:

1. actinomycosis;

2. sarcoidosis;

3. tuberculosis;

4. felinosis;

5. metastatic involvement of the lymph nodes;

6. lymphoproliferative diseases (Hodgkin's and non-Hodgkin's lymphoma);

7. chronic reactive lymphadenitis;

8. abscessed lymph nodes and abscesses and phlegmons originating from them;

9. acute lymphadenitis.

In all patients, the treatment was surgical, except for those with acute lymphadenitis of the head and neck, in which it was conservative.

The **methods** used by Assoc. Prof. Yanko Georgiev Yankov, MD, PhD in the study of the contingent were correctly selected and are clinical, anatomical-topographic, histological, microbiological, epidemiological and statistical analysis of the data with a graphical presentation of the results obtained.

The **conclusions** reached by Assoc. Prof. Yanko Georgiev Yankov, MD, PhD are thirteen in number and are of exceptional significance for the medical community:

1. the number of hospitalized patients with head and neck lymph node diseases varies cyclically between 2015 and 2024 – with an increase until 2019, a decline during the Covid-19 pandemic (2020-2021), and recovery thereafter;

2. there is no long-term and clearly expressed trend in the number of hospitalized patients with head and neck lymph node diseases, but rather short-term fluctuations reflecting external factors (such as the Covid-19 pandemic) and individual variability;

3. hospitalized patients with head and neck lymph node diseases treated surgically are almost four times more than those treated conservatively;

4. the most common diseases of the lymph nodes of the head and neck among the entire studied population of hospitalized patients are oncological, and the rarest are felinosis and tuberculosis;

5. in hospitalized men with diseases of the cervical lymph nodes, malignant diseases dominate - lymphomas and metastases, and in hospitalized women - lymphoproliferative and acute nonspecific lymphadenitis;

6. in hospitalized men there are higher average values, but fewer different diseases of the lymph nodes of the head and neck, while women show a greater variety of diagnoses, but with a more even distribution between them;

7. the isolated Gram-positive microorganisms in hospitalized patients with acute lymphadenitis of the head and neck and with abscesses and phlegmons arising from them are over ten times more than Gram-negative;

8. age alone is not a significant predictor of antibiotic resistance in most cases of acute suppurative inflammation of the lymph nodes of the head and neck in hospitalized patients, with differences in sensitivity being mainly due to the type of isolated microorganism, not to the age of the patients;

9. in even small representative samples (nine cases for levofloxacin and seven for meropenem), all isolates studied in purulent lymphadenitis of the head and neck showed 100% sensitivity to levofloxacin and meropenem - antibiotics with universal sensitivity;

10. intestinal bacteria isolated in acute purulent infections of the lymph nodes of the head and neck in hospitalized patients remain highly sensitive to a wide range of

antibiotics, while in patients with isolated staphylococci, the latter often exhibit partial or high resistance and require a more precise choice of therapy;

11. there is no antibiotic to which both staphylococci and intestinal bacteria are absolutely resistant;

12. a statistically significant gender dependence was found for piperacillin – the proportion of sensitive isolates was more than three times higher in men than in women with acute purulent lymphadenitis;

13. males with acute purulent lymphadenitis have higher sensitivity to most antibiotics, while females show higher levels of resistance.

The **contributions** of the dissertation are of original nature and great significance. They are as follows:

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

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

3. for the first time in Bulgaria, a large and detailed comparison was made between surgical and conservative treatment in patients with lymphadenopathy in the maxillofacial region, 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 were proven, which may assist in the choice of their empirical antibacterial treatment;

8. gender-specific antibiotic sensitivity was 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 formed for optimizing antibiotic therapy in acute purulent lymphadenitis in the maxillofacial region, based on established patterns in gender-specific resistance - men have a higher sensitivity to most antibiotics, while women require more precise selection.

In the defense of the scientific degree "Doctor of Sciences" in the "Surgery" program, Assoc. Prof. Yanko Georgiev Yankov, MD, PhD used scientific works that not only cover,

but also exceed the necessary **scientometric requirements** of the Medical University "Prof. Dr. Paraskev Stoyanov", Varna, Bulgaria for the acquisition of the scientific degree "Doctor of Sciences", which is evident from the academic report provided, certified by the Library of the Medical University of Varna, Bulgaria, dated 11.09.2025.

The scientific activity of Assoc. Prof. Yanko Georgiev Yankov, MD, PhD can be divided into the following **scientometric indicators**:

- dissertation for the degree of "Doctor of Science" on the topic "Lymph nodes in maxillofacial surgery - normal and most common diseases" - one issue, covering 100 points out of the required 100 points;

- full-text publications published in scientific journals, referenced and indexed in world-renowned databases with scientific information - five issues, covering 120 points out of the required 100 points in total together with the next indicator;

- full-text publications published in non-refereed journals with scientific review - five issues, covering 51 points out of the required 100 points in total together with the previous indicator.

That is, Assoc. Prof. Yanko Georgiev Yankov, MD, PhD not only collects the required number of points, but also exceeds them.

Of all **ten scientific publications** with which Assoc. Prof. Yanko Georgiev Yankov, MD, PhD participated in the defense, he is the sole author of one of them, which was published in a scientific publication, referenced and indexed in world-renowned databases of scientific information.

Of the remaining nine scientific publications for participation in the defense, in which he is part of an author team, he is the first author of two full-text publications in scientific publications, referenced and indexed in world-renowned databases of scientific information, and of five full-text publications in non-refereed publications with scientific review.

He is the second author of two full-text publications in scientific publications, referenced and indexed in world-renowned databases of scientific information.

In the defense, Assoc. Prof. Yanko Georgiev Yankov, MD, PhD participated with seven citations in full-text publications in scientific publications, referenced and indexed in world-renowned databases of scientific information, which bring him 105 points out of the required 100 points.

The **scientific contributions** of Assoc. Prof. Yanko Georgiev Yankov, MD, PhD are divided into the following clinical areas:

1. Etiological causes of acute lymphadenitis of the head and

The articles he presents in this section are original works related to the study of the etiological bacterial spectrum of patients from the pediatric population (under 18 years of age) with acute purulent infections of the lymph nodes of the head and neck and of the etiological tooth for the occurrence of abscesses and phlegmons of the head and neck of odontogenic origin in patients over 18 years of age. Data on similar studies conducted in Bulgaria and on a large number of patients have not been found in the medical literature, which indicates the originality of the studies conducted, including that in the dissertation work itself, in which the observations of the patients cover a ten-year period of study.

2. Metastatic involvement of the lymph nodes of the head and neck

The dissertation and the clinical case presented by the dissertation examine the involvement of the lymph nodes and extranodal structures in malignant processes both in the maxillofacial region and in those with more distant localization. These scientific works (especially in the dissertation) describe and analyze in detail the malignant involvement of the cervical lymph nodes in individual oncological diseases, their prognosis, diagnosis and behavior algorithm, comparing older scientific data with the new ones available in the world literature.

3. New markers for the study of inflammatory diseases of the head and neck

One of the original articles reviewed patients with odontogenic and non-odontogenic abscesses of the head and neck and analyzed the role of the inflammatory blood markers procalcitonin (PCT) and C-reactive protein (CRP) in the context of the bacterial pathogens that were isolated during the microbiological examination of the sample of evacuated pus taken during surgical treatment. For a more precise study, the isolated microorganisms were divided into Gram-positive and Gram-negative. The study showed that the ratio between the mean platelet volume and the platelet count (MPV/PLT), known as MPI, is a more accurate diagnostic indicator than MPV and PCT alone when it comes to distinguishing isolated Gram-positive from Gram-negative bacteria.

In the study described in another original article, inflammatory markers (NLR - neutrophil/lymphocyte ratio and MPV - mean platelet volume) were examined in patients with odontogenic and non-odontogenic abscesses of the head and neck. They were compared with time-tested indicators such as white blood cell count (WBC), C-reactive protein (CRP) and procalcitonin (PCT). The results showed that in odontogenic abscesses, CRP and neutrophil count were higher, while in non-odontogenic abscesses - platelet count (PLT), lymphocyte count and PCT were higher. The study emphasizes that combining CRP and PCT with NLR and MPV can provide a significantly better and more precise assessment of the severity of infections and help predict the outcome of the disease in patients.

4. Lymphatic cervical dissection

Both in the dissertation work itself for the acquisition of the NS "Doctor of Sciences", and in one of the review articles, in which Assoc. Prof. Yanko Georgiev Yankov, MD, PhD is a co-author, the metastatic involvement of the cervical lymph nodes in malignant tumor processes, their prognosis, difficulties in diagnosis and the algorithm of their behavior are described and analyzed. The most common localizations of cervical metastases are described in detail depending on the localization of the primary process, as well as the types of cervical lymph dissections that are applied in their treatment. The individual types of cervical lymph dissections are described and analyzed, their advantages and disadvantages, as well as the main stages of the surgical technique of their implementation.

5. Lymphoproliferative diseases in the maxillofacial region

This section contains the dissertation for the award of the National Academy of Sciences "Doctor of Sciences" and two review articles, which describe and analyze in detail the main lymphoproliferative diseases that are characteristic of the maxillofacial region. They outline the similarities and differences between Hodgkin's and non-Hodgkin's lymphomas, their manifestations, features of diagnosis and the main directions of their treatment. Their

etiology and clinical manifestations are described in detail, as well as the tissues and organs of the head and neck that they involve.

6. General data on lymphadenopathy

Both in the dissertation for the award of the National Academy of Sciences "Doctor of Sciences", and in one of the review articles, in which Assoc. Prof. Yanko Georgiev Yankov, MD, PhD is a co-author, the essence of lymphadenopathy in humans is described in great detail, emphasizing those in the head and neck area, which are of fundamental importance for the clinical practice of the maxillofacial surgeon, emphasizing the individual types of lymph node diseases, the causes that give rise to them, their clinical manifestations, difficulties in the diagnostic and treatment plan and the role of the maxillofacial surgeon in the therapy of these diseases.

7. Oral leukoplakia and its relationship with the lymph nodes of the head and neck

Oral leukoplakia is a relatively common disease in the maxillofacial region, which, if not treated promptly, can become malignant. This feature of it is discussed in one of the review articles, in which Assoc. Prof. Yanko Georgiev Yankov, MD, PhD is a co-author. The same article describes in detail the nature of the disease, its clinical manifestations, diagnosis and treatment. The value of the article is that it examines oral leukoplakia in the context of the lymph nodes of the head and neck and their involvement in this precancerous condition, and provides recommendations and guidelines for behavior in cases of absence and presence of lymphadenopathy.

3. Teaching and research profile of Assoc. Prof. Yanko Georgiev Yankov, MD, PhD

Assoc. Prof. Yanko Georgiev Yankov, MD, PhD works as an associate professor of maxillofacial surgery at the Department of General and Operative Surgery of the Faculty of Medicine at the Medical University "Prof. Dr. Paraskev Stoyanov", Varna, Bulgaria. As such, he gives **lectures and exercises on maxillofacial surgery to medical and dental students** in both Bulgarian and English. As an associate professor, he actively participates in the **exams of dental students** in semester and state exams.

4. Conclusion of the review

The scientometric indicators provided to me fully comply with the Law on the Development of the Academic Staff of the Republic of Bulgaria and the Regulations on the Development of the Academic Staff of the Medical University "Prof. Dr. Paraskev Stoyanov", Varna, Bulgaria for the acquisition of the scientific degree "Doctor of Sciences".

On this basis, I vote **positively** and recommend to the members of the Scientific Jury to award **Assoc. Prof. Yanko Georgiev Yankov, MD, PhD** the scientific degree **"Doctor of Sciences"** in the **scientific specialty "Surgery"**, field of higher education "7. Health and Sports", professional direction "7.1. Medicine".

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

26.10.2025 Reviewer: .....

City of Plovdiv /Prof. Bozhidar Dimitrov Hadzhiev, MD, PhD/