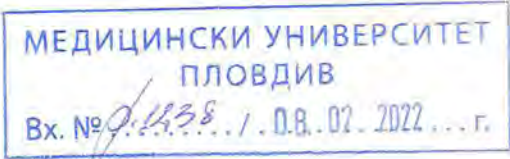


TO THE CHAIRMAN OF THE SCIENTIFIC JURY,
DETERMINED BY ORDER P-131/31.01.2022 OF
PROF. DR. M. MURDZHEVA, RECTOR OF MU-PLOVDIV



REVIEW

by **Prof. Dr. DEYAN EMILOV YORDANOV, PhD**

Head of Thoracic Surgery Clinic – Military Medical Academy - Sofia

of the dissertation for awarding the educational and scientific degree “Doctor”

Professional field – Medicine

Doctoral Program in Thoracic surgery

Author – **Dr. Velizar Dafinov Hadzhiminev**

Form of doctoral studies: Independent preparation

Department of Special surgery

Topic: „Secondary spontaneous pneumothorax – a study on diagnostic and therapeutic approach“

Supervisor

Assoc. Prof. Dr. Ivan Novakov, DSc

1. General presentation of the doctoral procedure:

The presented set of materials on paper and electronic media is in accordance with Art.70/1/ of the Procedure for Acquisition of ESD “Doctor” in MU-Plovdiv, Regulations of MU-Plovdiv and includes the following documents:

- Curriculum vitae in European format with the signature of the doctoral candidate
- Orders for enrolment for doctoral studies for expulsion with the right to defence
- Dissertation
- Abstract
- List of scientific publications on the topic of the dissertation

2. Biographical data:

Dr. Velizar Dafinov Hadzhiminev was born on March 22, 1988 in Nova Zagora. In 2007 he graduated from Foreign Language School, Haskovo with English and German. He graduated from the Medical University of Varna in 2013. In the same year he started working as a resident doctor in the "Second Clinic of Surgery" of the University Hospital St. George - Plovdiv. In 2019 he became a specialist in Surgery. In 2017 he started working as an assistant professor in the Department of Special Surgery at MU-Plovdiv. In 2021 he started working as assistant-professor in the Department of Propedeutics of Surgical Diseases, Department of Surgery at MU-Plovdiv. He is fluent in English and German.

3. Relevance of the topic

The dissertation is dedicated to a current problem in the field of thoracic surgery - secondary spontaneous pneumothorax. This is an emergency, sometimes even dramatic, life-threatening, requiring hospitalization and almost always surgical treatment. The diseases and harmful habits that cause it are well known. In recent years, a new factor has been added - the successive and overflowing waves of the COVID-19 pandemic. The pulmonary changes caused by the virus led to a significant increase in the incidence of secondary spontaneous pneumothorax. This fact, of course, makes the dissertation even more relevant.

The presented work is written on 148 pages and is structured as follows:

- introduction – 2 pages.,
- literature review – 42 pages.,
- aim and tasks – 1 page.,
- materials and methods – 7 pages.,
- results and discussion – 65 pages.,
- conclusions – 2 pages., contributions and deduction – 2 pages.,
- bibliography – 21 pages., which includes 210 publications, all in Latin, only two research groups are from Bulgaria, which I believe is a shortcoming of the work. Many Bulgarian teams have researched the topic about spontaneous pneumothorax - I believe that the conclusions they have reached would find a worthy place in this dissertation.
- scientific publications on dissertation's topic – 1 page.

The dissertation is illustrated with 37 figures, 12 tables and 1 scheme.

4. Literature review

It is written on 42 pages. Historical data on the development of knowledge about pneumothorax from ancient times are presented in detail. The author rather accepts the etiological classification of pneumothorax. An in-depth study of the epidemiological and pathophysiological aspects of secondary spontaneous pneumothorax described in various literature sources has been made. The various etiological factors that can lead to this condition are discussed in detail. At a separate point the author dwells on the complications - tense pneumothorax and pleural fistula. I think that the pleural empyema is missed here, in which the prolonged broncho-pleural fistulas are often complicated. Properly, more attention is paid to the various treatment methods of secondary spontaneous pneumothorax.

The review has a good cognitive value, as the doctoral student demonstrates a high level of awareness of the problem.

The aim of the dissertation and the tasks are clearly and precisely formulated, and the implementation of the tasks logically leads to the achievement of the goal. Admiration should be given to the last task, which shows that the author is sympathetic to this serious complication of patients in the current epidemiological situation.

5. Materials and methods

After determining the inclusion and exclusion criteria for the patients, subjects of the study are 2 logical units - retrospective and prospective groups of patients. They consist

of 179 patients with secondary spontaneous pneumothorax. The signs of observation are determined and the methods are described, which are subdivided into clinical, interventional and therapeutic. Statistical methods for data processing are described in detail.

6. Results and discussion

This is the main part of the dissertation - 65 pages. This part of the research is divided into 5 parts: epidemiological aspects, etiology of secondary pneumothorax, side and size, methods of treatment and complications and COVID-19-patients with secondary spontaneous pneumothorax. The first three parts systematize the results of the division of patients by sex, age, number of relapses, seasonality. The data are analyzed correctly and the first conclusions of the analysis are obtained: males predominate, more often affected age over 55 years and lacks seasonality for the disease.

Regarding the etiological factors that caused secondary spontaneous pneumothorax, the conclusions are that the leading cause is COPD, but in patients under 55 the leading cause is interstitial pneumonia. COVID-patients were studied in a separate group.

Regarding the side and size, after processing the results and discussing them, the conclusions are that more often the pneumothorax is right-sided, with a size of more than 2 cm and tense secondary pneumothorax is more common in patients over 55 years.

As a clinician, I believe that the most important part of the dissertation is related to the study of treatment methods. Without questioning the reliability of statistical data processing, I must note at the outset that the result is very worrying, which puts videothoroscopic atypical resection in fourth place as a therapeutic approach after thoracotomy. This fact is a bad indicator not only in terms of thoracic surgery, but also in terms of medicine in general.

For the last 10 years, in the clinic I run a thoracotomy for pneumothorax has not been performed. The presence of only 7 videothoroscopic resections of such an impressive number of patients is an alarming signal.

The author brings videothoroscopic pleurodesis into a separate therapeutic approach, which is second in frequency after thoracostomy. In a significant number of publications on the subject, performing a single stage of videothoroscopic atypical resection for bullae removal and subsequent pleurodesis, regardless of its type, is already considered the "gold standard". The most probable reason for this, in my opinion, is the high value of automatic staplers, which the Health Insurance Fund does not reimburse, and patients are not able to buy.

Complications include continuous air leakage and postoperative pulmonary fibrosis. Interestingly, this large group lacks purulent-septic complications, although a significant number of patients with large broncho-pleural fistula have been treated.

Of interest is the separate analysis of the group of COVID-19 patients. Higher mortality in them corresponds to older age and post-COVID changes in the lung parenchyma, which is also an aggravating factor.

The discussion of the results has a specific character. I consider as good idea that Dr. Hadzhiminev draws his own conclusions at the end of each of the chapters. This is a good final element that creates clarity.

7. Conclusions and contributions

The dissertation offers 10 conclusions which are logically derived directly from the presented results.

As a contribution of the dissertation I accept:

1. Scientific and theoretical contributions

- For the first time in Bulgaria the problem about secondary spontaneous pneumothorax is being studied
- In the conditions of COVID-19 pandemic, a significant group of infected patients with secondary pneumothorax has been studied;

2. Contributions of applied nature

- The author proposes a diagnostic and treatment algorithm for patients with secondary spontaneous pneumothorax, which would be useful for physicians in various specialties.
- Computed tomography has been established as the best imaging-diagnostic method for indicating surgical treatment.

Dr. Hadzhiminev has 4 scientific publications on the subject, 3 of which are in English.

The presented abstract is made according to the requirements and reflects the main results achieved in the study.

8. Conclusion

The presented dissertation contains significant scientific results that represent an original contribution to science and practice and meets all the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria, the Regulations for the implementation of the Law and the Regulations of MU-Plovdiv. In view of the above, I confidently give my positive assessment of the study and propose to the esteemed scientific jury to award the educational and scientific degree "Doctor" to Dr. Velizar Hadzhiminev, in the doctoral program "Thoracic Surgery".

03.02.2022
Sofia


Prof. Dr. Deyan Yordanov, PhD