

**STATEMENT
FROM**

**ASSOC. PROF IVAN PETKOV NOVAKOV, DMS
DEPARTMENT OF SPECIAL SURGERY
MEDICAL UNIVERSITY PLOVDIV
BULGARIA**

of a dissertation for or awarding the educational and
scientific degree 'PhD'
professional direction "Medicine"
doctoral program "Thoracic Surgery".

Author: Dimcho Dimitrov Argirov

Type of PhD studies: independent

Department: Special Surgery

**Topic: "SONOGRAPHIC CONTROLLED TRANSTHORACAL
CUTTING BIOPSY - ROLE AND SIGNIFICANCE IN
DIAGNOSING PERIPHERAL LESIONS OF THE LUNG,
MEDIASTINUM AND THORACIC WALL".**

Scientific supervisor: Prof. Dr. Angel Petrov Uchikov dms

**Department of Special Surgery- Medical University -
Plovdiv.**

I. General presentation

I was presented with a set of materials on paper and electronic media in accordance with Art. 115 (1) of the Procedure for the acquisition of a doctorate in MU - Plovdiv; Regulations of 2 MU-Plovdiv from 06.11.2014, which includes the following documents:

II. – Application to the Rector of MU-Plovdiv for disclosure of the procedure for the defense of a dissertation work

- curriculum vitae in European format with the PhD student's signature
- a notarized copy of a higher education diploma
- orders for enrollment in doctoral studies, interruption of studies (due to maternity) and for continuation of studies; for deduction with right of defense
- an order for conducting an exam from the individual plan and a corresponding protocol for a passed exam or doctoral minimum in the specialty
- protocol of the departmental council for the preliminary discussion of the pre-dissertation work and the decisions made for the disclosure of the procedure and for the composition of the scientific jury
- dissertation work
- abstract
- a list of scientific publications on the topic of the dissertation
- copies of scientific publications

- list of participations in scientific forums
 - list of noticed citations
 - declaration of originality and authenticity of the attached documents
 - other documents related to the course of the procedure 3 ESD
- Procedure - 13

The PhD student has attached three publications: two of which are in Bulgarian, and the third is in English.

II. Short biographic presentation.

Dr. Dimcho Dimitrov Argirov was born on 06.05.1964 in the town of Elhovo. He completed his secondary education at "Kliment Ohridski" secondary school in Elhovo in 1982. He graduated Medicine at the Medical University of Plovdiv in 1990. He has been working in the Third Surgical Clinic of "St. George" UMBAL since 1991. as assistant and resident. Since 1995, he has been a senior assistant, and since 2000, as a chief assistant. From 2012 to 2013, he was a resident at the Second Surgery of UMHAT "St. George". In 2013, he started working in the newly formed department of "Thoracic Surgery" at UMHAT Kaspela, where he has been working until now as a resident and teacher at the MU - Plovdiv. He has two specialties: in "General Surgery" since 1995 and in "Thoracic Surgery" since 2000. In 2023, he graduated from Health Management at the Health Department of the Medical University of Plovdiv. He completed a course in "Laparoscopic surgery" - 1999, "Abdominal echography" - 2005.

III. Relevance of the topic and appropriateness of the set goals and tasks

In the introduction of his dissertation, Dr. D. Argirov examines the problem of diagnosing lung carcinoma, as the most common cause of death from malignant disease in both men and women worldwide. He indicates different methods for early diagnosis with varying degrees of invasiveness, emphasizing a relatively new methodology- the transthoracic biopsy of peripheral tumor formations of the lung, chest wall and mediastinum under ultrasound control. As a self-taught PhD student, Dr. Argirov emphasizes on the safety of the methodology which is without radiation, with low cost and precise control in real time. He also points the extremely low risk of complications and the acceptable diagnostic result. In this sense, Dr. D. Argirov has developed a topical problem in scientific and applied terms.

IV. Knowledge of the problem.

The performed literature review, the clearly formulated aim and the well-set tasks show that Dr. D. Argirov has knowledge on the problem of "diagnosing the peripheral lesions of the lung, mediastinum and chest wall by means of ultrasound-controlled transthoracic cutting biopsy" and that he appreciates creatively the material.

IV. Research methodology.

The study of Dr. D. Argirov is retrospective. It included 264 patients who underwent transthoracic biopsy (for a period of 2 years from January 2020 to December 2021). Statistical analysis was used, allowing generalization and interpretation of the obtained results. This

shows that a research methodology chosen allows the achievement of the set aim of the dissertation through an adequate response to the tasks.

VI. Characterization and evaluation of the dissertation work.

The dissertation is written on 119 standard typewritten pages. It is illustrated with 26 figures and 12 tables and an appendix. The bibliographic reference includes 239 sources, of which 9 are in Cyrillic, and the remaining 230 are in Latin.

The review thoroughly examines the problem of increased morbidity and mortality from lung cancer, as well as its characteristics and localization. An analysis is made of the state of morbidity and mortality in the world and in our country, as well as of imaging methods. Ultrasound as a diagnostic tool in thoracic pathology and the biopsy guided by it of peripheral formations of the lung, chest wall and mediastinum are thoroughly reviewed. Various aspects related to the diagnostic accuracy of the manipulation and its parallel with the CT guided biopsy are highlighted. Analyzing the data from the literature review, the significance of the intervention is reported as safe and effective with high diagnostic accuracy for benign lesions and neoplasias, as well as the possibility to prevent operative interventions in many cases. It is indicated that regardless of the experience gained in recent years, there is room for further systematization and improvement of the diagnostic-invasive protocol and making the method routine in the diagnosis of peripheral lung formations. The aim of the dissertation work is also clearly formulated

- to study, specify and improve the diagnostic possibilities of transthoracic biopsy under ultrasound control in patients with radiographic evidence of a chest formation with suspected malignancy, measure the sensitivity, accuracy and predictive values of the method in different tumors of the chest /lung, chest wall and mediastinum/ and prevent complications related to it.

In order to achieve this goal, the dissertation student has set five tasks for implementation, as follows:

- to make a demographic-clinical characterization of patients with peripherally located formations in the chest who underwent ECTTRB for the period from January 2020 to December 2021;
- to analyze and evaluate the results of the conducted ECTTRB;
- to determine the diagnostic role of ECTTRB in identifying lung carcinomas and metastatic lesions in patients with peripherally located formations in the chest and those in the mediastinum and chest wall;
- to monitor the types of complications after ECTTRB;
- to specify the diagnostic approach when performing ECTTRB by improving the technique, reducing the rate of complications and developing an algorithm in order to increase its capabilities.

After statistical processing of the data and its analysis, the PhD student made eight summarizing conclusions as follows:

1. The results obtained by ECTTRB are fully comparable with the other alternative interventional techniques – mediastinoscopy, VATS, or open biopsy/surgery, which is why the method is defined as the

method of first choice in patients with pulmonary lesions accessible to ultrasound visualization, those of the chest wall and mediastinum.

2. The diagnostic effect is significant, and the approach is simple enough, inexpensive, without additional radiation exposure, performed in the emergency setting, at the patient's bedside, with continuous real-time monitoring and can be used as an outpatient procedure.

3. CT images, with sufficient resolution and subject to reconstruction with peripheral pulmonary lesions, are a necessary element in the algorithm for the correct decision-making to perform ECTTRB. There is a correspondence between the CT and ultrasound images.

4. A statistically low degree of concordance between CT and ECTTRB was found. This result can be explained by the fact that in computed tomography studies, peripherally located formations in the chest are not definitive of malignancy. CT positive findings have a higher relative share than positive diagnoses based on ECTTRB.

5. Our proven biopsy technique achieves sufficient quality and quantity of biopsy material with a low rate of post-biopsy complications.

6. The implementation of the intervention by a team of thoracic surgeons with mastery of the ultrasound technique is preferable to a team of pulmonologists or paraclinicians and is a prevention to deal with the occurrence of life-threatening complications of the patient.

7. The analysis of the main reasons for the mistakes made in the ECTTRB and the imposed recommendations to overcome them achieves a reduction in their frequency.

8. A major disadvantage of ultrasound biopsy is its strong dependence on the experience and qualifications of the operator.

The analysis of these conclusions allows me to indicate that the set tasks have been solved and, accordingly, the purpose of the dissertation has been fulfilled. A very thorough analysis was performed on the role and significance of ECTTRB in the diagnosis of peripheral thoracic lesions.

VII. Contributions and significance of the development for science and practice.

The dissertation work of Dr. D. Argirov presented is a complex and in-depth observation on the role of ultrasound-guided transthoracic cutting biopsy in the diagnosis of peripheral lesions of the lung, mediastinum and chest wall. As the author points out, for the first time it is recommended that the manipulation be carried out by thoracic surgeons, which gives the patient greater peace of mind about the outcome of the intervention and is a guarantee of adequate and quick handling in the event of possible complications. For the first time, a real comparison of the results of modern imaging methods and those obtained by US-guided biopsy is made. The causes and errors of the intervention are analyzed and a specific approach to overcome them is proposed. The role of ECTTRB as a method of first choice in

the early diagnosis of lung tumors with peripheral ultrasound-accessible localization is confirmed. An algorithm of treatment-diagnostic approach to the peripheral lesions in the chest and behavior depending on the obtained biopsy material was developed.

The presented dissertation provides surgeons and oncologists with an opportunity for accurate preoperative diagnosis and subsequent adequate therapeutic behavior.

VIII. Assessment of dissertation publications.

Dr. D. Argirov has presented three publications related to data from the dissertation work, one of which is in English. He is the first author in them.

IX. Personal participation of the doctoral student.

I believe that the realization of this dissertation work is entirely the work of the dissertation student Dr. Dimcho Argirov, both the analysis of the obtained results with their conclusions and the formulated contributions.

XI. Abstract

In terms of content and quality, the presented abstract reflects the main results achieved in the dissertation, with their conclusions and, accordingly, contributions.

XII. Critical notes:

1. The dissertation is written on 98 pages - A4 format, with "Ariel" font and text size "12". Larger font size, e.g. "14", will firstly increase

the volume of the dissertation and, more importantly, allow the reader to better appreciate the importance of this scientific work.

2. The literary review is presented in 40 pages, while the volume of the dissertation work is 98 pages. The ratio of 1:3 for literature review and own studies with discussion was not observed.

3. The literature review begins with the diagnostic problems in lung carcinoma. They are thoroughly presented. Then the diagnostic problems in bulky processes of the chest wall, pleura, mediastinum and finally pulmonary pathology are considered. Lung carcinoma is also a form of lung pathology. In this sense, lung cancer should also be included in the structure of the literature review in the "pulmonary pathology" section, without displaying it as a separate section.

4. The "Conclusion" section begins with an emphasis on lung carcinoma and the topic of the dissertation work is "ultrasound-guided biopsy for the diagnosis of peripheral lesions of the lung, mediastinum and chest wall".

5. I believe that a scientific study of this volume can be completed with greater publication activity.

XIII. CONCLUSION

The dissertation work of Dr. Dimcho Argirov has scientific and applied results that meet all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria , the Regulations for the Implementation of the law and the relevant Regulations of the Ministry of Education - Plovdiv.

Due to the above, I confidently give **my positive assessment** of the conducted research, presented by the above-reviewed dissertation work, abstract, achieved results and contributions, and I propose to the honorable scientific jury to award the educational and scientific degree "PhD" to Dr. Dimcho Argirov in Ph.D. program in "Thoracic Surgery".

Reviewer: /

Заличено на основание
Чл.5 §1, б."В" Регламент (ЕС)2016/679

Assoc. Prof Dr. I. NOVAKOV; DMS

25.03.2024