

OPINION

By Prof. Dr. Valeri Lyubenov Gelev, PhD

Head of the Cardiology Clinic,

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On the dissertation for the educational and scientific degree "PhD" in the field of higher education 7. Health and Sports, professional field 7.1. Medicine, doctoral program "Cardiology".

Author: Dr. Krasimir Rosenov Dzhinsov

Form of doctoral studies: Independent preparation

Scientific unit: Cardiology Clinic,

Topic: "Significance of marking radiofrequency lesions and their characteristics in the isolation of the pulmonary veins of patients with atrial fibrillation"

Scientific supervisor: Prof. Dr. Vasil Borislavov Traykov, PhD

1. General presentation of the procedure and the doctoral student

The dissertation has been discussed and proposed for defense by an extended Scientific Collegium of the Cardiology Clinic at Acibadem City Clinic UMHAT Tokuda. At a meeting of the Scientific Council of Acibadem City Clinic UMHAT Tokuda (Minutes No. 61/26.11.2025) and by order No. 15-01-448#2/ /22.12.2025 of the Executive Director and the Procurator of the hospital, I have been elected as an internal member of the Scientific Jury. I am determined to present an Opinion.

No gaps are found in the documentation attached by Dr. Krasimir Dzhinsov, the requirements of the LDASRB, RLDRASRB and the Regulations for the Development of the Academic Staff at Acibadem City Clinic UMHAT Tokuda have been met.

No plagiarism was detected from the provided Metadata StrikePlagiarism.com reference.

I declare that I have no conflict of interest with the author of the dissertation.

Dr. Krasimir Dzhinsov graduated from the Medical University of Plovdiv in 2012. Since 2012, he has been a doctor in the Department of Invasive Cardiology of the University Hospital "St. George" Plovdiv, and since March 2020 he has been the head of the Electrophysiology and Pacing Sector. From November 2016 to December 2020, he has been a doctor at the National Clinical Hospital "NHH", and from July 1, 2024 until now he has been the Executive Director of the hospital. Since December 2021, he has been an assistant professor of cardiology, invasive cardiology and rhythmology at the Medical University of Plovdiv.

Dr. Dzhinsov obtained a specialty in "Cardiology" in 2017. at the Medical University of Plovdiv, Certificate in Interventional Electrophysiology of the Heart of EHRA/ESC - 2019 and acquired professional qualification with recognized legal competence in "Cardiac Pacing - Basic and Expert Level" - 2019 and in "Invasive Electrophysiology - Basic and Expert Level" - 2019. He has numerous specializations in Invasive Electrophysiology, Cardiac Pacing and treatment of rhythm disorders abroad. Since January 2023 he has been the Chairman of the Association of Cardiac Pacing and Electrophysiology in Bulgaria.

2. Relevance of the topic

Atrial fibrillation (AF) is the most common arrhythmia in humans. It is one of the leading causes of embolic stroke and the manifestation of heart failure, impaired quality of life, cognitive dysfunction and depression. AF is also an independent predictor of overall mortality. An important place in the treatment of AF is occupied by the strategy for controlling the heart rhythm. Finally, with the development of technologies and our knowledge of the mechanisms of AF, new methods for performing ablation procedures in these patients have also become widely available. Despite the development of knowledge about the mechanism of AF occurrence and catheter ablation as a more effective treatment method, there are a number of unresolved issues. One of them concerns the development of a method for achieving permanent and continuous ablation lines, which will allow for consistent and repeatable success in more patients. This is a prerequisite for conducting the present study. The topic is relevant from a practical point of view.

3. Knowledge of the problem

The doctoral student knows the state of the problem and creatively evaluates the literary material.

4. Research methodology

The selected research methodology allows achieving the set goal and obtaining an adequate answer to the tasks solved in the dissertation.

5. Characteristics and evaluation of the dissertation work and contributions

The dissertation work of Dr. Jinsov is written in a volume of 195 pages. It is structured correctly and includes the following sections: Table of contents – 2 pages; Abbreviations and symbols used - 2; Introduction – 3 pages; Literature review – 40 pages; Aim and objectives – 2 pages; Material and methods – 21 pages; Own results – 56 pages; Discussion, conclusions – 24 pages; Bibliography – 41 pages; Contributions – 1 page; Publications and participation in congresses – 2 pages. The bibliographic reference contains 336 literary sources, of which 9 in Cyrillic and 327 in Latin. The work is illustrated with 44 figures and 28 tables.

The introduction well formulates the problem and justifies the purpose of the dissertation.

The literature review is well structured in accordance with the topic being developed. It is written competently and shows good knowledge of the problem in its various aspects. The social significance of atrial fibrillation is examined, as well as the mechanism of its occurrence, maintenance and treatment. Restoration of pulmonary vein conduction remains the leading cause of AF recurrence after catheter ablation. The use of automatic marking and objectively measured biophysical parameters can improve procedural success, reduce recurrences and positively affect the quality of life of patients.

The goals of the dissertation are well formulated in accordance with the topic of the dissertation and the presented literature review. The present work aims to study the procedural characteristics and procedural success in patients with AF treated with catheter ablation using manual and automatic marking as well as objectively measured characteristics

of radiofrequency applications and to search for the relationship between the method of marking the lesions and the characteristics of radiofrequency applications and the long-term absence of relapse and the change in the quality of life of the patients. The tasks set, a total of 5, are completely sufficient and are fully implemented in the dissertation work.

The section "Materials and Methods" describes in detail the 131 patients with AF who underwent manual or automatic placement of markers for isolation of the pulmonary veins during radiofrequency catheter ablation of AF in three centers - St. George University Hospital - Plovdiv (n=33), National Heart Hospital - Sofia (n=48) and Acibadem City Clinic University Hospital Tokuda - Sofia (n=50). The patients were divided into 2 groups. Group 1: Includes 48 patients in whom the operator used manually placed markers to mark the radiofrequency applications. Group 2: Includes 83 patients in whom the operator used automatically placed markers to mark the radiofrequency applications from the electroanatomical mapping system. The methodology is considered as a detailed protocol for selection, preparation and performance of catheter ablation in AF with complete electrical isolation of all pulmonary veins with inflow and outflow block. 3a The statistical processing of the data used appropriate methods and a modern statistical program (SPSS v.26, Stata MP v.17, JASP v.0.18.3, Microsoft 365 and a specially developed software product for the needs of the study), which guarantees the accuracy of the results.

Results and discussion: The study included 131 patients with paroxysmal (n=103; 78.6%) or persistent (n=28; 21.4%) AF. The mean age of the included patients was 59.0 ± 9.27 years, median 60 years (IQR: 54–66, range 31–78), of which 75.6% (n=99) were men and 24.4% (32) were women. The presented results are convincing and clear.

The doctoral student objectively notes some limitations and critical remarks mentioned in the context of the study. However, they do not reduce the scientific significance of the dissertation work.

Conclusions and contributions: Based on the results obtained, Dr. Jinsov logically makes 7 conclusions that correspond to the tasks set. The most important of which are that catheter ablation in patients with AF, performed with automatic marking of radiofrequency applications, is associated with a statistically significantly shorter radiofrequency time and total procedure time compared to manual marking, which suggests a more efficient use of medical resources. Automatic marking detects significantly more gaps in the ablation lines, including in places where manual marking does not take such into account. It provides an opportunity for standardization of the ablation procedure by using objective biophysical parameters, which reduces operator dependence and improves the repeatability of the results.

The contributions are 6. The most important of a theoretical nature are that for the first time in Bulgaria a systematic comparison has been made between manual and automatic marking of radiofrequency applications in catheter ablation for atrial fibrillation, analyzing the impact on procedural efficiency, gaps in the ablation lines and long-term clinical results. A model for assessing the effectiveness of ablation is presented, including objective biophysical

characteristics of the applications (impedance drop, energy, power, duration), which correlate with long-term clinical success. New criteria for assessing gaps in ablation lines, based on automatic marking, applicable in clinical practice when assessing the effectiveness of PVI, have been introduced.

6. The abstract is presented on 72 pages and reflects what is written in the dissertation. In accordance with academic requirements, it presents the contributions and a list of publications related to the dissertation is attached.

7. Assessment of the publications and personal contribution of the doctoral student

The doctoral student has submitted 3 publications (2 in international journals and 1 in a Bulgarian journal indexed in Scopus) and 6 scientific communications (2 in international scientific forums and 4 in national ones). In all publications and communications, Dr. Jinsov is the first author. This scientific activity is sufficient to show that the doctoral student is consistent in his scientific activity and exceeds the national minimum requirements for the educational and scientific degree "Doctor".

CONCLUSION

The dissertation contains scientific, scientifically applied and applied results that represent an original contribution to science, expanding our knowledge in the field of electrophysiology and in particular in the treatment of patients with AF. It is written in a strictly scientific style. The submitted materials and the dissertation work meet all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations for the Implementation of LDASRB and the Regulations of "Acibadem City Clinic UMHAT Tokuda".

Dr. Krasimir Dzhinsov is a well-established physician - clinician and specialist in electrophysiology with over 13 years of work experience. The dissertation work shows that the doctoral student possesses theoretical knowledge and professional skills in the scientific specialty "Cardiology", by demonstrating qualities and skills for independent conduct of scientific research.

Due to the above, I give my positive assessment and recommend to the members of the Scientific Jury to positively assess the dissertation "Significance of marking radiofrequency lesions and their characteristics in the isolation of the pulmonary veins of patients with atrial fibrillation" and to award Dr. Krasimir Rosenov Dzhinsov the scientific and educational degree "PhD" in the field of Higher Education 7. Health and Sports, professional field 7.1. Medicine, doctoral program "Cardiology"

21/01/2026

City of Sofia

Prepared the opinion:

Prof. Dr. Valeri Gelev, PhD