To

Chairman of the Scientific Jury

Appointed by order

of the Executive Director

of „ Acibadem City Clinic UMHAT Tokuda EAD

№ 15-03-123 # 2 / 15.06.2023

**R E V I E W**

From: Prof. Dr. Plamen Georgiev Panayotov, PhD, Head of the Clinic of Cardiac Surgery at UMHAT „ Sveta Marina “, Varna. Head of the Department of Cardiovascular Surgery and Angiology, Medical University „ Prof. Dr. Paraskev Stoyanov “, Varna. Member of the scientific jury of the competition for acquisition of the academic position „ ASSOCIATE PROFESSOR " in the field of higher education 7. „ Health and Sports ", professional field 7.1. "Medicine" and scientific specialty "Heart-vascular surgery", announced in SG no. 37 of 25.04.2023 for the needs of „ Acibadem City Clinic UMHAT Tokuda EAD. Sofia.

For the above competition are submitted documents by one candidate - Dr. Ivilin Plamenov Todorov, PhD, cardiac surgeon at the Clinic of Cardiac Surgery at UMHAT „ Acibadem City Clinic UMHAT Tokuda EAD Sofia. The documents submitted by the applicant are in accordance with the requirements for acquiring the academic position „ associate professor" in accordance with the Law for Development of the Academic Staff in the Republic of Bulgaria ( ZRASB ) and the Regulations for the terms and conditions for acquiring degrees and holding academic positions of UMHAT „ Acibadem City Clinic Tokuda University EAD. I do not find any gaps in the submitted documentation and I declare that I do not have common scientific papers with the candidate.

**Short biographical data:** Dr. Ivilin Plamenov Todorov graduated from secondary education in 2001 at the National High School of Natural Sciences and Mathematics. Sofia. Higher Medical Education He graduated from MU – Sofia in 2007, after which he was appointed resident in the Department of Cardiac Surgery at „ Acibadem City Clinic UMHAT Tokuda EAD, Sofia, where he works at present. In 2014 he acquired a specialty in „ Cardiac Surgery “. In 2019 he completed a master's degree in „ Health Management “ at the PHO of MU – Sofia. From the same year until now he has been a part-time assitant at the Faculty „ Medicine “ at Sofia University „ St. Kliment Ohridski “. Increases his professional qualification by attending international training courses. In 2021, he successfully defended his dissertation on „ Surgical treatment in patients with prosthetic valve endocarditis “ for obtaining an educational and scientific degree „ PhD“.

Dr. Todorov has 16 years of medical experience, all of which he works in the ward / clinic of Cardiac Surgery.

**1.Research**

**1.1.Publications**

Dr. Ivilin Todorov, PhD presented for participation in the competition a total of 25 published scientific papers: one dissertation for obtaining an educational and scientific degree doctor" „ Surgical treatment in patients with prosthetic valve endocarditis“, one single monograph and four chapters in a co-authorship monograph included in the list of 24 publications and communications. Six of the publications presented are in magazines with an impact factor.

**1.2 Scientific forums**

Dr. Ivilin Todorov has presented 11 published summaries of scientific messages, of which 8 in Bulgarian and 3 in international forums.

**1.3 Authorizing and quoting**

Total impact factor of the periodicals -10,473.

The report from the Central Medical Library ( ex. № 245 / 12.05.2023 ) shows: 9 Bulgarian quotes. Citation index in international scientific journals – 2 in Web of Knowledge and 1 databases in Scopus ( without self-cited ).

**2.Research profile**

Dr. Ivilin Todorov's research work is entirely in the field of Cardiac Surgery. According to the subject of the presented scientific papers, the research activity of the candidate can be grouped into the following topics:

**I.Diagnosis and surgical treatment of infectious endocarditis;**

**II.Reoperations in cardiac surgery, prosthetic valve endocarditis;**

**III.Cardiac and non-heart tumors – difficulties and solutions in cardiac surgery.**

**3.Basic scientific and scientific-applied contributions**

Contributions from publications are presented and grouped by topic.

**3.1.Infectious endocarditis ( publications 1,4,15,116 )**

The publications listed are devoted to the surgical treatment of the native valve endocarditis ( NVE ), as a significant disease with a poor prognosis without adequate treatment. A prognostic model for increased operational risk is proposed, as well as a choice of optimal time for surgery. The studies answered the question whether the type of valve prosthesis used in NVE surgery is relevant to the development of early prosthetic valve endocarditis ( PVE ).

Another important point is the study of the degree of correlation between echocardiographic data and intraoperatively found changes, which is essential institutionally in the diagnosis of infectious valve endocarditis and its complications. This could be used to compare data from other treatment institutions.

A model has also been proposed for the assessment and choice of the optimal time for surgery in patients with native valve endocarditis.

**3.2. Reactions in cardiac surgery, prosthetic valve endocarditis ( publications 2, 3, 5, 10, 12, 13, 17 )**

Introduced and confirmed in the practice of the Clinic, where Dr. Todorov works, is the method of balloon occlusion of LIMA coronary artery bypass graft used in patients with prosthetic valve endocarditis. This reliable, easily applicable and relatively safe technique improves myocardial protection protection, surgical results and prognosis of patients in need of reoperative cardiac surgery for PVE.

A model has been proposed to establish the risk of death in patients operated on the occasion of the PVE. The prognostic model created by the author identifies as the most significant preoperative risk factors for perioperative and early postoperative death, increasing the risk to 15 times includes:

* the need for double-sided or three-valve prosthetics;
* preoperative septic condition and shock;
* development of heart failure that imposed implantation of IABP;
* preoperative IV NYHA functional class and emergency operation.

The duration of the ECC and duration of aortic clamping ( Ao.Cl ) have been identified as the most important factors for increased mortality. With a duration of Ao.Cl of more than 110 minutes, the sensitivity to recognize high-risk patients reaches 90% and the specificity – 71 %.

The clinical characteristics and results of surgical treatment of patients with early and late PVEs were compared and it was found that with adequate diagnosis, timely and adequate surgical treatment, early prosthetic valve endocarditis is not a predictor of increased nosocomial mortality.

The relationship between the type of valve prosthesis used in the previous heart operation ( biological or mechanical ) and the development of the PVE was studied and, that biological and mechanical valve prostheses are affected equally by the infectious process, whether the prosthetic valve endocarditis is early or late.

The author's publications regarding the reconstructions of cardiac surgery, which are associated with an increased risk of postoperative complications and mortality, are also of interest. The main problems that are sitting in front of doctors during these operations are considered. Methods to facilitate surgery and reduce complications and mortality are also discussed.

 Prosthetic valve endocarditis is an extremely serious and life-threatening complication of the ( or valve-restorative ) surgery associated with increased morbidity and mortality.

In the presented monograph: „ PROSTHESIS VALVE ENDOCARDITIS – CLINIC, DIAGNOSTIC AND TREATMENT, dedicated to the main aspects of the clinic, diagnosis and surgical treatment in patients with prosthetic valve endocarditis, significant scientific contributions are presented. The importance of the presented algorithm and the main steps in performing the different types of surgical interventions should be noted. Essential scientific and applied value are the conclusions and recommendations for the daily practical activity of cardiac surgeons, directing to correct specific solutions for diagnosis and treatment. The monograph presents the importance of the multidisciplinary model for the diagnosis, medical and surgical treatment of the PVE, and the challenges and solutions when the infection involves a prosthetic valve are discussed in depth, as the risks of re-heart surgery can be significant. The historical data for PVE are traced and the current literature for treatment with specific valve involvement ( ie. aortic and / or mitral ) and the challenges, problems and results are illustrated, which lead to clinical decisions in the light of the latest and most effective therapeutic approaches, strategic and practical algorithms in the treatment of the disease.

**3.3. Cardiac and non-heart tumors, difficulties and solutions in cardiac surgery ( 6, 7, 8, 9, 11, 18, 19, 20, 21, 22, 23, 24 )**

 The scientific-applied contributions in the scientific developments dedicated to difficult and complex cases from the practice and experience of the team of the Clinic of Cardiac Surgery, to which Dr. Ivilin Todorov belongs, also deserve attention. In a patient with Marfan syndrome and severe pectus excavatum, the proposed cardiac surgery for extracorporeal perfusion using two parallel-linked oxygenators as effective, easy and safe method in patients with „ extreme “ perfusion needs, providing the surgical team with sufficient oxygenator „ reserve “ to perform optimal and safe surgery.

**3.4. Miscellaneous ( 7, 11 )**

Diseases of large vessels in the heart ( large vessels in the mediastinum ) when the pathological process is primary or when engaging in tumor processes in the lungs. The main scientific contributions are of a scientific nature ( cases of practice that may be useful for other surgeons and cardiologists ).

**4.Teaching and teaching**

An official reference for the teaching and teaching activities of

Dr. Ivilin Todorov, as a part-time assistant at the Faculty of Medicine at Sofia University „ Kliment Ohridski ”:

In the school year 2019/2020: exercises in „ Surgical diseases ” of 3-6 medical courses - 24 study hours;

In the 2020/2021 school year: exercises „ Surgical diseases ” of 3-6 year medical students – 6 school hours;

In the 2021/2022 school year: exercises „ Surgical diseases ” of 3-6 year medical students - 39 study hours.

**5.Membership in scientific organizations**

Dr. Ivilin Todorov, PhD is a member of the following scientific organizations:

- Bulgarian Society of Cardiac Surgery;

- Member and Secretary of the Bulgarian Association of Cardiac, Vascular and Thoracic Surgery;

- European Association of Cardio-Toracic Surgery ( EACTS ).

**6.Conclusion**

Based on the analysis of scientific activity and activity, teaching and healing activities and scientific contributions, it is clear that Dr. Ivilin Plamenov Todorov, PhD is an extremely prepared and in-depth scientist, teacher and doctor with extensive experience in the field of cardiac surgery. It meets more than the minimum national requirements for holding an academic position „ ASSOCIATE PROFESSOR “ under the SEAP, its implementing rules and regulations on the terms and conditions for acquiring the scientific degrees and holding the academic positions in „ Acibadem City Clinic UMHAT Tokuda “ EAD, as at least 400 points. it collects a total of 542.5 points.

In conclusion, I believe that Dr. Ivilin Plamenov Todorov, PhD meets all the requirements of ZRASB and the Regulations for the conditions and the order for acquisition of scientific degrees and borrowing of AD in „ Acibadem City Clinic UMHAT Tokuda “ EAD. I propose that the esteemed jury be awarded the academic position „ ASSOCIATE PROFESSOR“ , in the field of higher education 7. „ Health and sports “, professional field 7.1 „ Medicine “ and scientific specialty „ Cardiovascular surgery “.

29.08.2023. Prepared the review:

Varna Prof. Dr. Plamen Panayotov, PhD.