

## **PEER REVIEW**

by Prof. Plamen Gueorguiev Panayotov, MD, PhD

Medical University 'Prof. Paraskev Stoyanov' of Varna

Head of the Department of Cardiovascular Surgery and Angiology

of a dissertation work for the acquisition of the educational and scientific degree of 'doctor of philosophy' in the field of higher education No 7. Public health and sports, professional trend No 7.1. Medicine for a scientific speciality of 'Surgery' and doctoral programme of 'Vascular surgery', cipher 03.01.49,

approved member of the Scientific jury (Protocol No 1/January 20, 2023) according to Order No R-109-14/January 12, 2023 of the Rector of the Medical University of Varna.

**Theme: „DELAYED REVASCULARIZATION IN PATIENTS WITH ACUTE  
ARTERIAL ISCHEMIA OF THE EXTREMITIES“**

of Rumen Dimitrov Runkov, MD

vascular surgeon in St. Panteleimon Hospital of Yambol, PhD student in the doctoral programme of 'Vascular surgery' at the Clinic of Vascular Surgery of St. Marina University Hospital of Varna at the Faculty of Medicine

Adviser: Prof. Veselin Petrov Petrov, MD, PhD

### **PhD student's career profile**

Rumen Dimitrov Runkov, MD, was born on January 9, 1959. In 1985, he graduated from the Higher Institute of Medicine of Varna, in the specialty of 'Medicine'. In 1985, he started to work as shop physician in Tundzha textile combine in the town of Yambol. In 1986-1991, he was intern in the Division of Surgery of St. Panteleimon Hospital of Yambol. In 1991-2011, he was intern in the vascular sector of St. Panteleimon Hospital of Yambol joint-stock company while in 2011-2021, he was head of the Division of Vascular Surgery of St. Panteleimon Hospital of Yambol joint-stock company. Since January 2022, he works as head of the Division of Vascular Surgery of Heart and Brain Hospital of Bourgas joint-stock company. He acquired the master degree in nursing care management, in the specialty of 'Health Management' from Prof. Asen Zlatarov University of Bourgas in 2010. He acquired the specialties of 'Surgery' in 1991 and of 'Vascular surgery' in 2011. He completed a course in Doppler sonography in Sofia in 2003. He has a command of Russian language.

### **General description of the materials presented**

The dissertation and author's dissertation summary are presented to me in a printed and electronic format which meet the requirements of the Law for development of the academic staff in the Republic of Bulgaria and of the Statute-book for its application in the Medical University 'Prof. Paraskev Stoyanov' of Varna. Copies of three of the publications related to the dissertation work in electronic and printed format are presented to me, too.

The theme of the dissertation work is completely topical and defensible. It deals with the operative treatment of the socially-significant acute arterial insufficiency of the extremities because of acute thrombosis, embolism and injury of these arteries. The importance of the timely diagnostic and surgical behavior in these patients is emphasized. Postoperative results depend to a great extent on this. The selection of the most suitable clinical and instrument imaging methods for a precise diagnosis and the application of individualized methods not only of early but also of delayed revascularization of the damaged arteries are useful in the future work not only of the PhD student but also of vascular surgeons and invasive radiologists in the country.

**The dissertation work** is presented on 179 typewritten pages and structured in six main sections with additional subsections in most of them. The reference list includes 182 titles of which seven in Cyrillic and 175 in Latin. The main sections are: Introduction - 1 page; Review of the literature - 52 pages; Purpose and tasks - 1 page; Material and methods - 18 pages; Own results - 37 pages; Discussion - 39 pages; Concluding remarks - 2 pages; Conclusions - 1 page; Bibliography - 18 pages. It stresses that the publications printed during the last two years are 74 (40,66%). The dissertation work is illustrated by a total of 80 tables, 43 figures and one appendix.

Two out of six contributions indicated by the author are of scientifically applicable but four ones are of confirmatory nature.

In the **introduction**, the PhD student substantiates the medico-social significance of the problem of the acute arterial insufficiency of the extremities and its adequate complex diagnosing and treatment.

**The review of the literature** includes six sections, some of which have subsections. The contemporary methods of diagnosis, conservative therapy and surgical methods of treatment of the patients are described in detail. Patients' individual quality of life following treatment is discussed, too.



In the last section of the review of the literature 'Critical appraisal of the literature on the problem circle', the present level of knowledge of this pathology and its treatment in Bulgarian and world practice are generalized.

**The main purpose** of the dissertation is 'To study in a comparative aspect our results from the application of the early and late revascularization in the patients with acute arterial ischemia of the extremities'. The purpose is clearly defined and accentuates on the possibilities for a successful diagnosis and an effective operative treatment.

The six tasks indicated by the PhD student are concrete and directly associated with the defined purpose. I would like to outline his ambition to establish the advantages of the combination of the standard and distal vascular accesses over the standard accesses alone in the patients with a delayed revascularization hospitalized for treatment after the 10<sup>th</sup> hour from the onset of the disease.

**The clinical material** of the dissertation includes a retrospective investigation of data from 273 patients aged between 18 and 98 years who are treated on the occasion of an acute arterial insufficiency of the extremities during the period between January 1, 2011 and December 31, 2020 incl. The patients are hospitalized in St. Panteleimon Hospital of Yambol joint-stock company where the PhD student works during this period.

The patients are distributed in the following groups: 102 with thrombosis, 117 with embolism, 21 with injuries of the arteries, and 33 with amputations of the extremities. An analysis of this population according to gender and age as well as of the annual dynamic of three types of the operative interventions such as early revascularization with standard accesses, delayed revascularization with standard accesses and delayed revascularization with standard and distal vascular accesses has been performed. The results achieved from the application of the concrete surgical methods in dependence on the etiology and extent of damage of the arteries of the lower and upper extremities have been juxtaposed.

The surgical technique of the operations has been described in detail.

In the dissertation, attention has been paid to the main imaging diagnostic methods such as contrast peripheral angiography, echography, and Doppler sonography. The angiological status has been evaluated based on the values of the wrist-ankle index of the upper limb arteries introduced by the PhD student and on those of the ankle-brachial index of the lower limb arteries.

The elaborated original algorithm for diagnostic and therapeutic behavior in the patients with acute arterial ischemia of the extremities who undergo delayed revascularization after the 10<sup>th</sup> hour from the onset of the disease is applicable in the clinical practice.

The information about the parameters examined in the dissertation has been collected and processed by means of modern statistical methods used in the medical practice.

In the section '**Own results**', Rumen Runkov, MD, illustrates and analyzes the results from his study. He presents patients' main demographic characteristics and the types of the surgical interventions they have undergone. The dynamics of the values of the wrist-ankle index and of the ankle-brachial index objectively reflects the extent of the clinical improvement or healing of the patients operated on. In the dissertation, there are numerous tables and figures giving a clear idea of the results from the comparisons of patients' groups in terms of the concrete parameters.

The issue of the localization of the thrombosis, embolism and vascular injury in the arteries of the lower and upper extremities represents an undoubted interest. The number and relative share of the amputations of the extremities performed are comparatively small.

In the dissertation work, special attention has been paid to the identification of a great number of main and more seldom accompanying diseases which, undoubtedly, hamper the therapeutic behavior. It deals predominantly with cardio-vascular diseases and type 2 diabetes mellitus.

In the section '**Discussion**', the own results have been juxtaposed to those indicated in publications by authors from prestige medical centers. The statistically significant differences established in terms of the postoperative results between the delayed revascularization with standard and distal vascular accesses and the delayed revascularization with standard accesses only have been presented.

In the section '**Concluding remarks**', the good results from the surgical treatment carried out in the patients verified pre- and postoperatively by means of these sufficiently effective methods have been generalized.

In the concluding section '**Conclusions**', there are five conclusions made which logically follow from the material as a whole and its exposé, the statistical analyses performed, and data interpretation. They confirm the scientific and practical value of the



defined purpose and tasks for its achievement. They direct the improvement of the work when diagnosing and treating the acute arterial insufficiency of the extremities.

**Contributions of scientifically applicable and confirmatory nature** - I accept as significant the six contributions described by the author. They are based on the results from the treatment of the patients through individualized, modern operative methods which is an achievement for the scientific works published in Bulgarian practice.

**The author's dissertation summary** has been structured according to the requirements. Its contents correspond to the dissertation work.

**Conclusion** - The dissertation work of Rumen Runkov, MD, is a comprehensive investigation of a significant clinical material for a 10-year period which deals with the important and topical problems of the diagnosis and operative treatment of the patients with acute arterial ischemia of the extremities.

Based on all the aforementioned here, the actuality and importance of the problems studied in the dissertation work, I give my **POSITIVE** evaluation and propose to the Honored Scientific Jury to positively vote for awarding the educational and scientific degree of '**doctor of philosophy**' to Rumen Dimitrov Runkov, MD, in the scientific specialty of 'Surgery'.

February 18, 2023  
City of Varna

Peer reviewer:



Prof. Plamen Panayotov, MD, PhD