

МБАЛ-ПКБ ЕАД
Вх. № HC-50/29.03.24

To Chairman of Scientific Jury,
appointed by order of
Executive Director of the NCH
No. 70/19.02.2024.

OPINION

By prof. Valentin Stefanov Govedarski, MD, PHD
Head of the Department of vascular and endovascular surgery, University hospital "prof.
Alexander Chirkov"

Chairman of the scientific jury for the competition for acquisition of the educational and scientific degree "Doctor" in the field of higher education 7. "Health and sport", professional direction 7.1. "Medicine" and scientific specialty "Cardiovascular surgery" with code 03.01.49

on the submitted dissertation thesis and abstract on topic:
"Surgical methods of treatment in iliac occlusive disease-comparative analysis"

Author of the dissertation: Dr. Bistra Petrova Boneva, vascular surgeon at the Clinic for Vascular Surgery at the "National Cardiology Hospital", Sofia

Research supervisor: Professor Dr. Mario Draganov Stankev, MD, PHD.

Cardiovascular diseases (CVD) encompass various conditions like coronary, cerebrovascular, and peripheral arterial disease, all linked by shared risk factors that contribute to atherosclerosis. This condition often affects multiple vascular regions concurrently, underlining CVD's critical status globally as a leading mortality cause. Peripheral arterial disease (PAD), affecting over 200 million people worldwide, becomes more prevalent with age and is particularly notable in older populations. This increase in PAD cases, integral to lower extremity vascular health, underscores its significant societal and healthcare impacts. Addressing iliac occlusive disease—a crucial PAD aspect—necessitates comprehensive strategies focusing on both reducing cardiovascular risk and managing PAD-specific symptoms. Medical interventions, lifestyle adjustments, and various revascularization techniques are vital components of patient care. The evolution of vascular medicine, featuring new revascularization methods, reflects ongoing advances yet highlights ongoing challenges in optimizing treatment pathways for diverse vascular issues.

The evolution of aortoiliac occlusive disease (AIOD) treatment has been marked by significant advancements in both open surgery and endovascular approaches. Historically, open surgery has been regarded as the benchmark for addressing occlusive lesions in the aortoiliac sector, characterized by advancements in medical instruments, prosthesis materials, and surgical techniques which enhanced the outcomes and reduced complications. This traditional method includes various bypass procedures tailored to specific iliac artery lesions.

Conversely, endovascular treatment has rapidly evolved into a preferred method for many vascular specialists due to its less invasive nature, advancements in technology, and the increasing proficiency of practitioners. This approach, especially pertinent for large iliac artery lesions, encompasses stages like access site selection, recanalization, and vessel preparation, often concluding with stenting to maintain vessel patency and assure adequate lower limb perfusion. Reflecting the trend towards minimally invasive procedures, the vascular community anticipates a future where the majority of interventions will be endovascular, highlighting the field's dynamic progression and the ongoing adaptation of treatment strategies to leverage technological innovations.

Hybrid surgery represents an innovative approach in vascular treatment, merging open and endovascular procedures to leverage their respective benefits. This method provides direct access to the common femoral artery, facilitating comprehensive treatment of both femoro-popliteal and iliac segments in a single session. It allows for precise surgical intervention on atherosclerotic lesions and ensures adequate outflow, particularly crucial in deep femoral artery cases. Hybrid procedures are highly effective for complex occlusive lesions, reducing the risk associated with subintimal guidewire entry, inability for intraluminal positioning of the guidewire and artery perforation during intervention.

The technique also supports remote endarterectomy for extensive iliac occlusions, minimizing the need for multiple endovascular implants and avoiding extensive use of synthetic materials like dacron grafts. It is especially beneficial for patients with subacute iliac occlusions, enabling effective thrombectomy and stenting. While hybrid surgery marks significant progress in vascular interventions, addressing its complexities and potential complications is crucial. Ongoing advancements in technology and procedural techniques continue to evolve, aiming to enhance both immediate and long-term patient outcomes in the aorto-ilio-femoral vascular territory.

The presented dissertation comprises 206 pages, featuring 48 tables and 58 figures to support its analysis and findings. It references a comprehensive bibliography with 286 sources, of which 8 are in Cyrillic and the remainder in English, reflecting a wide-ranging research scope. The dissertation's structure unfolds systematically, beginning with an introduction, followed by a substantial literature review. It then clearly delineates the study's objectives, methodology, and materials used. A significant portion is devoted to

presenting and discussing the results, highlighting the depth of research conducted. The discussion is extensive, ensuring thorough interpretation and contextualization of findings. The dissertation concludes with succinct sections summarizing the study's limitations, conclusions, and contributions of the author, before ending with a detailed bibliography (content of the dissertation includes: Introduction - 1 p., Literature review - 38 p., Aim and Tasks of the study - 1 p., Material - 5 p., Methods - 12 p., Results - 61 p., Discussion - 50 p., Limitations of the Study - 1 p., Conclusions - 2 p., Author Contributions - 1 p., Conclusion - 1 p., and Bibliography - 21 p.).

The initial sections of the literature review in the dissertation provide a thorough examination of peripheral arterial disease (PAD), addressing its epidemiology, etiopathogenesis, and clinical presentations. The discussion extends to elaborate on various treatment modalities, delineating conservative and invasive approaches, including open surgery, endovascular interventions, and hybrid techniques. Each method's indications, contraindications, benefits, drawbacks, and potential complications are meticulously evaluated. Additionally, particular attention is given to distinct patient scenarios, such as those with claudication symptoms and chronic limb-threatening ischemia, highlighting the nuanced challenges they present. The literature review culminates in an exploration of persistent gaps in the management of atherosclerotic afflictions in the lower extremities.

The dissertation acknowledges the critical need for refining management strategies for iliac artery chronic total occlusions, emphasizing evidence-based practice adherence. The significance of this research is underscored by the absence of comparative Bulgarian studies on the efficacy and safety of different surgical treatments for this condition. The thesis sets a clear objective to devise a comprehensive treatment algorithm for iliofemoral occlusive disease, considering various patient-specific factors. It outlines five pivotal tasks aimed at investigating the disease's impact on treatment selection, analyzing the effectiveness and patency of different surgical interventions, and assessing how risk factors influence treatment outcomes.

The dissertation meticulously outlines the materials and methods utilized to investigate various revascularization strategies for peripheral arterial disease (PAD). Detailed protocols for each strategy, including procedural steps, access points, and devices used, are systematically documented. Additionally, the approach to managing complications is comprehensively covered. The statistical analyses employed are thoroughly aligned with the study's objectives, ensuring the reliability of the conclusions drawn.

Results are presented in a comparative format across the three revascularization methods, enhancing the clarity and depth of the analysis despite the extensive data. The effective use of tables and diagrams further aids in the interpretation of the findings. In the discussion section, the author skillfully integrates the study's outcomes with existing

PAD treatment guidelines, offering a nuanced critique that acknowledges the study's retrospective design over 2009-2018. The comparative analysis with contemporary and historical literature enriches the context and validates the study's relevance.

The emphasis on a multidisciplinary team approach, patient selection criteria, and operator skill underscores the complex interplay of factors contributing to successful revascularization outcomes. The thesis stands out for its analytical depth, bridging current practice with robust research to inform better clinical decision-making in PAD treatment. The research discussed evaluates the efficacy of different revascularization strategies, focusing on patency rates as a critical outcome measure for peripheral arterial disease (PAD) treatments. Patency, particularly primary patency, serves as a vital indicator for the success of revascularization methods and informs the development of therapeutic algorithms. The study found that endovascular treatment demonstrated the highest primary patency rates over a 12-month period. In contrast, primary assisted patency rates remained stable throughout the first year for both endovascular and hybrid treatments, with hybrid approaches showing superior results compared to open surgery.

The analysis further reveals that trends in primary assisted ambulation varied, with endovascular treatment experiencing a sharp improvement in the first three months, then stabilizing. In contrast, hybrid treatments showed a consistent increase in interventions for restenosis, suggesting a more predictable pattern of maintenance. Open surgical treatments, however, exhibited a peak in restenosis-related events within the first year, highlighting potential variability in patient outcomes. This nuanced understanding underscores the complexity of PAD management and the need for tailored approaches based on individual patient and disease characteristics.

The dissertation highlights that 31.9% of patients with iliac occlusions also had concomitant cardiovascular disease (CVD), most notably in those undergoing hybrid treatment. Concurrent coronary artery disease (CAD) was identified in 16.2% of cases, with no significant variation between endovascular and open surgery groups, though hybrid methods showed a 30% higher occurrence. Only 1.2% of patients had simultaneous issues across all three vascular beds.

The detailed therapeutic algorithm offered for managing iliac occlusions—whether through surgical, endovascular, or hybrid approaches—is presented as a significant contribution, synthesizing research findings with current clinical guidelines. Particularly notable is the focus on patients requiring repeat revascularizations, a group for which clear guidelines are lacking, underscoring the necessity of personalized treatment plans. These decisions hinge on a multitude of factors, reflecting the complexity and individualized nature of vascular care, especially for patients with multifaceted and recurrent vascular conditions.

The conclusion of the research underscores significant findings in the realm of peripheral artery disease (PAD) revascularization strategies, highlighting that technical success, primary patency, and limb salvage rates are comparably effective across the three main revascularization methods. The study delineates that the severity of PAD, its stage, and the patient's clinical presentation significantly dictate the choice of revascularization technique. Specifically, endovascular treatment is favored for patients presenting with claudication symptoms, whereas more invasive strategies are applied to critical limb-threatening ischemia (CLTI) cases.

The research advocates for a tailored preoperative evaluation, emphasizing that treatment should be individualized based on a patient's specific health profile and disease characteristics. Particularly in high-risk patient cohorts, endovascular and hybrid approaches are preferred due to their association with better primary patency rates and fewer complications relative to open surgery, albeit with potentially higher rates of subsequent interventions required to sustain these results. The study ultimately positions hybrid treatments as the optimal choice for high-risk patients, providing a nuanced framework that integrates patient-centric considerations with empirical evidence to guide clinical decision-making in PAD management.

The thesis delineates five significant contributions that offer practical utility in enhancing the outcomes of surgical revascularization for patients with iliac segment occlusive lesions. These contributions are pivotal for their direct applicability in clinical settings, providing strategies that could potentially refine patient care and procedural success rates.

However, the thesis acknowledges a critical limitation: its retrospective design. This aspect may lead to substantial follow-up loss, particularly impacting the accuracy of primary assisted and secondary patency rates. Such a loss is more pronounced within specific patient subsets, including those with diabetes and critical limb-threatening ischemia (CLTI), which may skew the observed outcomes and limit the generalizability of the study's conclusions. Recognizing this limitation underscores the importance of prospective studies to validate these findings and mitigate biases inherent in retrospective analyses.

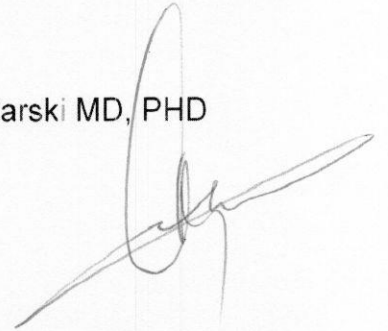
The assessment details provided confirm that Dr. Boneva successfully meets the stipulated national criteria outlined in Article 1, paragraph 4 of the pertinent regulations, achieving a total of 82 points against the necessary minimum of 80 for scientific activities related to obtaining a doctoral degree. This accomplishment indicates her compliance with the standards for academic achievement and eligibility for advanced academic positions within her field.

The evaluative conclusion presented suggests that Dr. Boneva's dissertation substantiates her comprehensive understanding and expertise in Cardiovascular Surgery. Her work is recognized for demonstrating substantial theoretical knowledge and professional competencies, alongside her capability to undertake independent scientific inquiry. Such attributes affirm her preparedness and qualification for the educational and scientific title of "doctor."

Based on this assessment, a strong endorsement is given for Dr. Boneva's research, advocating for her recognition with the doctoral degree. This recommendation acknowledges her contributions to the field and supports her academic advancement, reflecting positively on her scholarly and clinical qualifications within cardiovascular surgery.

12/03/2024

Professor Valentin Govedarski MD, PHD

A handwritten signature in black ink, appearing to read 'Valentin Govedarski', is written over the printed name. The signature is fluid and cursive, with a large loop at the top and a long horizontal stroke extending to the right.