

STATEMENT

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Regarding: dissertation work for the acquisition of a scientific and educational degree "PhD" in the scientific specialty "Surgery" on the topic: "Role of virtual colonoscopy in minimally invasive and robotic oncological colorectal surgery", developed by Dr. Mehmed Behchet Hadzhiveli, a doctoral student in independent form of education.

1. Procedural comments

By order № R-109-100 dated 02.02.2023 of Prof. Dr. Valentin Lyubomirov Ignatov, PhD, Rector of the Medical University "Prof. Dr. Paraskev Stoyanov", Varna, Dr. Mehmed Behchet Hadzhiveli was appointed as a doctoral student of independent studies at the First Clinic of Surgery of "St. Marina" University Hospital, Varna and I am appointed as *an external member of the Scientific Jury for the defense of his dissertation work*.

All documents related to the presentation and defense of the dissertation have been examined, and no violations and/or unfulfilled requirements have been found.

At the first meeting of the scientific jury, held on 02/03/2023, I was appointed to prepare an opinion.

Procedurally, the doctoral program itself, as well as my opinion, are fully compliant and do not conflict with the current legal framework in the country, namely - the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB) and the Regulations on the Development of the Academic Staff at the Medical University "Prof. Dr. Paraskev Stoyanov"-Varna.

2. Relevance of the topic

The topic of Dr. Mehmed Hadzhiveli's dissertation is extremely relevant for Bulgarian medicine both in a purely scientific and in a scientific-applied aspect for a number of reasons. Colorectal carcinoma is one of the most common oncological diseases in the world. More than 1 million new cases are diagnosed each year. Colon cancer is the third most common cancer in men (10.0% of all cancers) and second in women (9.4% of total cases) worldwide. Virtual colonoscopy (VC) is a minimally invasive technology for the diagnosis of colorectal pathology. The examination provides a scan and structural assessment of the entire colon and surrounding structures in the abdominal cavity. When colorectal carcinoma is diagnosed, multimodal treatment options expand. Minimally invasive and robotic techniques are entering operative interventions, occupying an increasingly large place.

This fact explains why there are still debatable issues both worldwide and in Bulgarian surgical practice regarding early diagnosis, time for surgical intervention, methods of radicalization and achieving better postoperative results.

These data are a small part of the facts and arguments determining the scientific-theoretical and practical interest in the VC, as well as the relevance of the topic of Dr. Mehmed Hadzhiveli's dissertation.

3. Designing the dissertation work. Knowledge of the issues. General assessment and comments on the aim, objectives, material, and methodology of the study.

The development is presented on 164 standard pages and contains: Title page; Contents - 2 pages; Abbreviations used - 2 pages; Introduction - 1 p.; Literature review - 52. p.; Material

and methods - 12 pages; Results - 38 pages; Discussion - 24 pages; Conclusions - 1 page; Contributions - 1. p.; Bibliography - 18 pages.

In general, the dissertation is richly illustrated with 29 tables and 59 figures.

The bibliographic reference includes 233 literary sources, in Bulgarian and foreign authors, in Latin.

The literature review is sufficiently comprehensive in volume 52 pages and represents a little more than 1/3 of the entire volume. At the beginning, the doctoral student presents brief historical data on the development of colonoscopy, which logically moves into the next section, concerning its modern appearance.

An important point in the literature review is the examination of the main indications for VC. Here, Dr. Hadzhiveli cites a number of studies and concepts from leading authors and schools regarding the results obtained and justifying the benefit of virtual colonoscopy.

In the next section, Dr. Hadzhiveli describes the different volume and method of minimally invasive surgical interventions, including robotic systems and related operations.

The other modern methods in the imaging diagnostics of oncological colorectal diseases, as well as patient satisfaction, quality of life and economic analysis of colorectal diagnostics are also examined.

The literature review ends with a critical assessment of the problem circle, representing a summary of the debatable moments in the modern VC.

It is these problems that give the doctoral student the basis for conducting his own research, for formulating his goal and the five tasks for achieving the goal. Both the goal and the tasks are clearly and precisely defined and are a prerequisite for the correct performance of the research and accurate interpretation of the obtained results.

The chapter "*Materials and methods*" includes two sections. In the first of them, Dr. Hadzhiveli presents the material included in the dissertation work, namely – 1,695 performed VC, regardless of their result, and in 812 of them, FCS was also performed. Detected neoplasms and pathology are classified by groups. Operative intervention was performed in 715 patients, 112 of which were minimally invasive. The second section describes virtual colonoscopy for colorectal polyps and colorectal cancer, as well as optical colonoscopy for colorectal polyps and colorectal cancer.

4. Evaluation of the results established in the study and the conclusions in the dissertation work.

The results obtained during the study are presented descriptively, graphically, and tabularly in VC diagnosis of benign and malignant colorectal diseases, as well as the diagnostic role of VC in extracolonic benign and malignant diseases.

An essential place in the presentation of the results is occupied by chapter 5.5 Diagnostic role of virtual colonoscopy in choosing a surgical method. Dr. Hadzhiveli analyzed in detail the topographic-anatomical distribution of colorectal carcinoma, the established synchronous pathologies, the volume of resection and the anatomical varieties of superior and inferior mesenteric artery.

Of interest is the result of the analyzed indicators in operative interventions with VC and without VC, with an emphasis on the benefits in the first group.

The discussion compares the data from the literature and the results obtained in the series of 1695 patients with VC, and this is presented in three directions - in colorectal cancer, in extracolonic diseases and in the choice of surgical method.

The conclusions formulated by Dr. Mehmed Hadzhiveli are 7 in number. They reflect the regularities and cause-and-effect relationships established by the doctoral student, which is why I accept them.

5. Evaluation of the contributions and publication activity of the doctoral student related to the topic

I also accept *the contributions* presented by Dr. Mehmed Hadzhiveli, related to the work on the dissertation, although they are not divided into "contributions of a confirmatory nature" or "contributions of a scientific-theoretical nature", etc.

In connection with the topic of the dissertation, Dr. Hadzhiveli presents 2 full-text articles published in Bulgarian journals.

6. Abstract

The abstract for Dr. Mehmed Hadzhiveli's dissertation meets the requirements in terms of volume and content. It is technically well-formed and gives a sufficiently clear idea of the essence of the development, reflecting in sufficient detail the material and methods, the results achieved and the formulated conclusions and contributions.

7. Critical Notes

Critical remarks were indicated in the course of the presentation, and they in no way diminish the merits of the dissertation work.

8. Conclusion

After a detailed review of the dissertation work and the publications related to it, I give an extremely high assessment of the overall work of Dr. Mehmed Hadzhiveli on the problems of virtual colonoscopy in minimally invasive surgery. A dissertation is an in-depth study. The doctoral students work on it, results obtained, their analysis, conclusions drawn and contributions prove *the personal merits of the doctoral student*.

The dissertation shows that the doctoral student has in-depth theoretical knowledge and professional skills in the scientific specialty "General Surgery", demonstrating qualities and skills for independent conduct of scientific research.

Due to the above, I confidently give my *positive assessment* of the conducted research, represented by the dissertation work, abstract, the achieved results and contributions. *I propose to the honorable scientific jury to award the fully deserved educational and scientific degree "PhD" to Dr. Mehmed Behchet Hadzhiveli in the doctoral program in "Surgery".*

1.03.2023



Prof. Dr. Atanas Stefanov Yonkov, Phd