

REVIEW

From

**Prof. Dr. Ara Garabed Kaprelyan, MD, PhD, DrMedSci, Head of the First
Neurological Clinic Of University Hospital “Saint Marina” - Varna**

Appointed as an official reviewer according to Order № P-109-188/15.03.2023 from the
Rector of MU – Varna

Based on Art. 45, para. 1 and 2 of the Regulations for development of the academic staff in
MU – Varna

Subject: Dissertation paper “Neuroendoscope-assisted evacuation of chronic subdural hematomas” presented by Dr. Stefani Mariyanova Todorova, assistant at MU “Prof. Dr. Paraskev Stoyanov” - Varna; UH “Saint Marina” – Varna, Clinic of Neurosurgery for the acquisition of educational and scientific degree “Doctor” in the scientific specialty “Neurosurgery” - Professional Field 7.1. Medicine, Area of higher education 7. Healthcare and sports.

1. General presentation of the procedure and the doctoral student:

Doctoral student Dr. Stefani Mariyanova Todorova presents a set of materials on paper and electronic media that meet the requirements of Art. 44, para. 3 of the procedure for acquiring the educational-scientific degree "Doctor" from the Regulations for the development of the academic staff at MU-Varna. The set of documents contains: the doctoral student's curriculum vitae, a formatted, bound dissertation and an abstract, the protocol of the doctoral examination, the enrollment order, the protocol of the Departmental Council with a positive review, a list and copies of the publications related to the dissertation and the necessary notarized copies of diplomas, author's reference for compliance with the minimum national requirements, declarations of originality, for the authenticity of the submitted documents for protection.

2. Brief biographical data:

Dr. Stefani Mariyanova Todorova was born in Razgrad in 1992. In 2011 She graduated from the "Konstantin Preslavski" High-school of Varna with excellent results. In 2017 graduated Medicine at the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna. After her graduation, she was appointed to the Neurosurgery Clinic at "Sveta Marina" UH EAD - Varna as a physician. From 2018 is a resident and since 2019 is a doctoral student at the Department of Neurosurgery and ENT Diseases at the Medical University - Varna. From 2020 is an assistant at the Department of Neurosurgery and ENT Diseases of the Medical University - Varna.

Over the years, as a medical student, she was enrolled as a demonstrator at the Department of Neurosurgery and ENT Diseases, MU - Varna.

Dr. Stefani Mariyanova has been working at the Neurosurgery Clinic for five years and is distinguished by her hard work, diligence, persistence and curiosity, she possesses excellent qualities such as creativity, collegiality and loyalty.

3. Relevance of the topic of the dissertation:

The topic, which Dr. Stefani Mariyanova Todorova has chosen is important and relevant. It affects a significant problem of medical care and treatment of patients with chronic subdural hematomas. Their number is increasing worldwide and nationally due to the main factors - the aging of the population in combination with the widespread use of anticoagulants and/or antiplatelets. This problem is a serious challenge for public health care in our country, it is related to the growing requirements and technological possibilities for treatment and care of patients.

Chronic subdural hematomas are found mainly in elderly patients. According to data from worldwide studies, the average age of those affected is about 76.8 years, with the male-female ratio being 3:1 among all age groups studied. The increase in the incidence of CSHD is a result of the combination of an aging population and the widespread use of anticoagulants and antiplatelet medications.

4. Understanding of the problem:

The serious interest and motivation of the author, as well as in-depth scientific training and professional experience, allow her to carry out a useful study of the problem. The collected

and analyzed information through the study allows adequate actions to be taken for effective treatment of patients with chronic subdural hematomas.

5. Structure and evaluation of the dissertation:

The dissertation contains 115 pages, including 3 tables, 37 figures, and 15 photographs. 201 literary sources are cited, of which 3 are in Cyrillic and 198 are in Latin.

The participation of Dr. Stefani Mariyanova Todorova in the conducted research is leading. The standards and criteria for science and ethics are in accordance with the requirements of: The Declaration of Helsinki on ethics in science and Bulgarian laws and regulations.

The work is structured as follows: introduction, five chapters, conclusions, conclusion, contributions, references.

The review of the literature is within 42 pages, laid out and structured very well. It shows the doctoral student's excellent knowledge of the topic, systematicity and wide scope of the issues under consideration. The in-depth review of the literature on the subject of leading Bulgarian and foreign authors and documents reveals the essence and significance of the researched problem. The made citations are properly labeled and described. A wide range of literary sources from the Bulgarian and especially from the world medical scientific literature on the subject were used. In chapter two, the purpose, tasks and hypothesis of the research are described. The aim of the dissertation is formulated precisely, clearly and summarizes the main strategy of the doctoral student - to evaluate endoscope-assisted evacuation of chronic subdural hematomas. Seven goal-relevant tasks are specified that are specific and realistic. A hypothesis was formulated, which is the starting point of the dissertation work, considering the endoscope-assisted evacuation of chronic subdural hematomas, as a safe and effective method for patients, including those in the elderly, being a minimally invasive surgical method of treatment with favorable outcome of the disease. The methodology of the dissertation is described in the third chapter. The methods used are detailed and comprehensively described. The research is retrospective in nature and conducted for the period 2011-2021. The presented material is reliable, convincing and sufficient for the logically presented results and general conclusions. The obtained results were processed using statistical methods - variation, dispersion, correlation and comparative analyses, risk assessment analysis. In chapter four are presented the results of the research. They are structured according to the tasks set. All analyzes are arranged systematically and richly illustrated, which supports their perception and conclusions. The author makes a relevant analysis of the obtained results. A total of 151 patients who underwent surgical treatment for chronic subdural hematoma were included in the study. The gender distribution is as follows: 108 men and 43 women. The average age is 70.56 years, with a standard deviation of 13.98. The analysis of the location of subdural hematomas shows that unilateral chronic subdural hematomas predominate (74.2 %) compared to bilateral ones (25.8 %), and of the unilateral ones, left-sided subdural hematomas prevail (45.7 %). The average length of stay of the patients in the medical facility was 6 days \pm 3.7 days (3-34 days). The mean size (width) of the subdural hematoma was 15.5 mm \pm 10.07 mm, ranging from 4 mm to 67 mm. The results of the present study show that 11.9% of patients with cSDH reported alcohol use, and 17.7% of those taking anticoagulants. Patients with hematological diseases are 4.6%, which are characterized by a long hospital stay, a complicated clinical picture and, in most cases, a fatal outcome. Precise indications and contraindications for the intraoperative use of a

neuroendoscope in the evacuation of chronic subdural hematomas are presented, as well as a Protocol for the intraoperative use of an endoscope in the neurosurgical operative treatment of chronic subdural hematomas. Additionally, recommendations are formulated for the intraoperative use of an endoscope in the neurosurgical treatment of patients with chronic subdural hematomas. The results of the present study indicate that endoscopically assisted evacuation of chronic subdural hematomas may be a safe and effective operative technique. In chapter five, the doctoral student makes a discussion and a comparative analysis, with the results of similar studies. Six general conclusions are formulated, which follow correctly and logically from the analysis of the results. I believe that it could be more, given the collected empirical material and data. The conclusions are specific, but at the same time comprehensive and reflect the most important conclusions obtained from the research abroad. The discussion follows the logic of the study and reasoned comments on the results. The scientific work is well structured, written in the standard academic style of presentation, clear and specific. From the presentation of the literature review, the tasks set, the results obtained and the conclusions drawn, the author's ability to chronologically and consistently follow the problems of the scientific topic and logically analyze the obtained data is evident. Based on these qualities, he makes relevant generalizations and subsequently significant conclusions, having scientific-theoretical and scientific-practical value.

6. Contributions and significance of the development for science and practice

The contributions are the personal work of Dr. Stefani Mariyanova Todorova, the result of her scientific and practical activities. I accept the contributions formulated in this way, reflecting and at the same time maximally synthesizing the essence of the dissertation submitted for evaluation.

- 1) A thorough characteristic of patients with chronic subdural hematoma was performed, risk factors were assessed and deduced, and a patient risk profile was created.
- 2) Based on the conducted analyses, has been proven the effectiveness of the neuroendoscope-assisted evacuation of a subdural hematoma.
- 3) Based on a thorough analysis of the existing specialized literature and the results of the study, indications and contraindications for the application of neuroendoscope-assisted evacuation of subdural hematoma have been formulated.
- 4) A protocol was developed and implemented for intraoperative application of an endoscope in neurosurgical surgical treatment of chronic subdural hematomas in the Neurosurgery Clinic of UH "St. Marina", city of Varna as a routine method of surgical treatment.
- 5) On the basis of statistical processing and data analysis, recommendations were formulated for the intraoperative use of an endoscope in the neurosurgical treatment of patients with chronic subdural hematomas.

7. Personal participation of the doctoral student

The participation of the doctoral student in the preparation and implementation of the scientific research is leading and was realized thanks to her initiative, communication and responsibility towards the work. The conclusions and contributions of the dissertation

formulated by Dr. Stefani Mariyanova Todorova are both her personal merit and the competent guidance of her scientific supervisors.

8. Abstract and publications on the dissertation work

The abstract meets the requirements and reflects the main results achieved in the dissertation. It is developed in a volume of 56 pages, illustrated with figures and tables. Correctly structured, written in clear and precise language fully reflects the issues and conclusions developed.

In relation to the dissertation, the doctoral student Stefani Marianova Todorova presents 1 publication in which she is the lead author. The publication was printed in a specialized international edition in English:

Todorova S: Endoscopically – assisted evacuation of chronic subdural hematoma – new gold standart?, International Bulletin of Otorhinolaryngology. 3/2022, 10-13

9. Notes and recommendations

In order to popularize the results of the research, I would like to recommend the doctoral student to expand the review of the literature on the problem of endoscope-assisted evacuation of chronic subdural hematomas. In the eventual publication of the study, the work can be enriched with an analysis of the results of a prospective study.

The professional and organizational qualities of doctor Stefani Mariyanova Todorova, demonstrated in connection with the research, could be used in institutional, national and international scientific projects with students, teachers and specialists.

CONCLUSION:

The presented dissertation contains results of a scientific-applied nature, clinically comparable and applicable in clinical neurosurgical practice, it fully meets the requirements for a dissertation according to the Bulgarian Law of Academic Development and the regulations of the Ministry of Health – Varna systematizes, proves and enriches the neurosurgical theory and practice in the country, as well as being a doctoral student Dr. Stefani Mariyanova Todorova possesses serious scientific knowledge and professional skills in the scientific specialty "Neurosurgery" demonstrating qualities and skills for planning, organizing and carrying out independent scientific research. Due to the facts stated above, I consider that the doctoral student meets the criteria and requirements for awarding the general educational and scientific degree "Doctor" in the doctoral program in Neurosurgery, for which I allow myself to propose to the respected Scientific Jury to award an educational and scientific degree " doctor" to Dr. Stefani Mariyanova Todorova and I give my positive vote.

Varna,

21/04/2023

Prof. Dr. Ara Garabed Kaprelyan, MD, PhD, DrMedSci

