ACADEMIC REVIEW

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Regarding

An academic contest for holding the academic position "Professor" in the scientific field of "Neurosurgery", professional field 7.1 Medicine, in the field of higher education 7.3 Healthcare and sports, as promulgated in SG, iss. 53 / 12.06.2020

One candidate participates in the contest -
Assoc. Prof. Vasil Hristov Karakostov MD, PhD

Biographical Data

Assoc. Prof. Vasil Hristov Karakostov was born on October 4, 1958. He graduated from the Medical Institute of Higher Education - Plovdiv in 1982. After graduation he worked as a pediatrician at the BNMP- Hospital Smolyan. Subsequently, he began a clinical residency in neurosurgery at the Clinic of Neurosurgery of Alexandrovska Hospital - Sofia. In 1986 he was awarded a specialty in Neurosurgery, and in the same year he started working as a District Neurosurgeon at the District Hospital in Smolyan. Two years later he was appointed "Assistant" at the Clinic of Neurosurgery of MU - Sofia. He holds the positions of "Senior Assistant", "Head Assistant", followed by Head of Department. Since 2017 he has been the Head of the Neurosurgery Clinic at the University Hospital "St. Iv. Rilski "- Sofia. In 2004, after successfully defending his thesis on the topic: "Stereotactic CT-based interventions in brain processes", he was awarded the academic degree "Doctor, PhD". Since 2007 he has been an Associate Professor in the scientific field of "Neurosurgery" at the Medical University of Sofia.

Assoc. Prof. V. Karakostov has conducted a number of residencies in Europe and the United States. He is a member of professional and scientific organizations at home and abroad, including AOSpine. He is an expert at the Accreditation Council of the Ministry of Defense and at the National Healthcare Insurance Fund. He is a member of the expert council on Neurosurgery with the Ministry of Healthcare and Co-Chair of the Balkan Association of Spinal Surgery. Participates regularly in the state examination commission for awarding a specialty in the field of Neurosurgery as a chairman and as a member of the commission.

Scientific Works

The total scientific production of Assoc. Prof. Dr. Vasil Karakostov includes 176 articles, full-text reports and abstracts published in journals and collections of abstracts of scientific events in Bulgaria and abroad.

The total published scientific works of Assoc. Prof. Dr. Vasil Hristov Karakostov include 82 scientific papers (27 after achieving "Associate Professor"), which include: dissertation (№ 1) - "CT-based stereotactic interventions in brain processes", for awarding the Educational and Scientific Degree "Doctor, PhD" and the thematically related publications (№ 1, 2, 3, 4, 5)

Monography (№ 82) - "Osteoporotic and pathologic vertebral fractures. Percutaneous augmentation techniques", published by "Multiprint" LLC. Sofia 2019 (p. 3-255. ISBN 978-619-188-335-6), co-authored a chapter from a monography (№10) - M. Marinov, V. Karakostov - "Intraoperative monitoring of evoked potentials in neurosurgery", from the monography "Modern technologic advances in operative neurosurgery". ed. A. Karkeselyan by "Medicine and Physical Education Publishing House" in 1988, pp. 4-15. Indexing: COBISS.BG-ID 1100258276.

Of the remaining 79 scientific papers and reports, 5 have been published in scientific journals

referenced and indexed in global databases and 74 in non-referenced journals, books and collections.

Assoc. Prof. Karakostov's scientific output includes 25 scientific papers and reports published in English and 57 in Bulgarian language.

In the evaluation of the total scientific production of Assoc. Prof. Karakostov we can particularly highlight 11 scientific publications abroad in English in renowned and high impact factor Western European Journals such as "Medimond Srl", " Monduzzi Editore ", Ophthalmologica“, “KARGER”, “Acta Neurochir.”, “Clin. Neuroradiol.”, “J. Neurointerv Surg”, “J. Korean Neurosurg Soc.”, “Supplement to Acta Neurochirurgica”, “Acad. of Bulg. Sci.”, “Interv. Neuroradiol.”, “Clin. Neuroradiol.”, “Acta Neurochir. (Wien)”, “Biotechnology & Biotechnological Equipment”.

According to data from the attached reference regarding the author's citations, 7 publications (№ 7, 13,36,44,69,72,75) maintain a large amount of positive references and so far they have been cited a total of 70 times. (Anales D Endocrinologie, 64 (6): 428-433 DEC 2003, Clinical And Experimental Ophthalmology, 31 (3): 220-228 Jun 2003, Medicine, 78 (4): 236-269 Jul.1999, Ophtalmologica 1997, VOL211 , ISS 4, pp 256-262 / Neuroradiol, 2019, 25 (1): 58-65, Acta Neurochir (Wien), 2019, 161 (5): 917-923,. J Neurointerv Surg, 2019, 11 (10): 1040-1044, J Neurointerv Surg, 2020, 12 (3): 303-307).

Thematic distribution of the publications by groups:

Dissertation for awarding the scientific and educational degree "Doctor, PhD” (and related scientific papers) - 4 articles - (№1,2,3,4,)

Habilitation work; Monography - 1 issue

Oncological diseases of the brain and the spinal cord - 16 articles

Vascular diseases of the CNS - 9 articles (№1,2,6,11,15, 16,22,23,24)

Operative neurosurgery, new diagnostic and intraoperative methods and technologies - 20 articles (,21,2,3,4,5,6,9,10,13,15,17,22,23,25,26,28,30,31 , 32.33)

Degenerative spondylodiscogenic diseases - 26 (№5,8,9,14,28,33, 34,35,38,125,127,128, 91,93, 95,97,99,100, 103, 104, 105, 106, 107, 109, 123,127)

CNS malformations, hydrocephaly - 4 articles (№ 23,30,36,117)

Neurotraumas - 5 articles (№85,86,87,90,91)

History and theory of neurosurgery, scientific information - 1 issue (№39)

Epilepsy - 3 articles (№39, 48,102)

Dissertation for awarding the scientific and educational degree "Doctor, PhD” and related scientific papers (№1,2,3,4,5,6).

Central in the scientific production of Assoc. Prof. Dr. Karakostov is the candidate's dissertation "Stereotactic CT-based interventions in brain processes" (№1), which is the first in our medical literature systematic overview on a large cohort of the author’s own clinical material.

The scientific and practical merits of the author's dissertation are reinforced by the fact that all the factual material included in the research is rooted in the author.`s own participation and experience.

For the first time in the country, the methodology of CT-based framework stereotactic interventions (stereotactic biopsy, stereotactic craniotomy, stereotactic localization and stereotactic exstirpation) have been introduced in the routine neurosurgical practice, as well as the indications for performing the different types of stereoctic interventions. The introduction of a "soft marker" for intraoperative determination of brain mass-lesions, in its current form, is of a markedly original nature. This technical solution and its implementation is achieved for the first time on a national and global scale, according to literature data. Assoc. Prof. Karakostov introduces for the first time in the stereotactic practice at home and abroad the double-rotational stereotactic biopsy with unilateral opening forceps, which allows for a more informative histological data and a visible reduction in the volume of the lesion on postoperative control-CT.

For the first time in our country the author introduces in the routine neurosurgical practice "serial stereotactic biopsy", which clearly improves the percentage of informative histology.

In the dissertation the author introduces his version of an applicable tumor-scope which in

combination with the path-marking to the brain lesion make the surgical intervention much more accurate, short and atraumatic. For the first time in our country a joint team uses the intraoperative combination of frame stereotaxy with endoscopy, as well as the combined use of biopsy and therapeutic localizing stereotactic interventions.

For the first time in the country, the author publishes and introduces in the neurosurgical practice the combination of localizing stereotactic methods and CT-guided limited craniotomy as a method for localization and resection of small intracranial lesions (metastases) in combination with microsurgical and endoscopic control. (№ 1,3,39,68,82)

Monography

The main scientific contributions of Assoc. Prof. Vasil Karakostov are related to some of the most common and socially significant diseases in the field of spinal neurosurgery, such as osteoporotic and pathologic vertebral fractures. His scientific works that address the use of minimally invasive percutaneous techniques of vertebral augmentation in this pathology, are publications (№78,79). The result of his interest in the field is the publication of the monography "Osteoporotic and pathologic vertebral fractures. Percutaneous augmentation techniques" in 2019. Within it, Assoc. Prof. Karakostov describes the historical stages of the emergence and development of percutaneous techniques for augmentation of osteoporotic and pathologic vertebral fractures, their epidemiological features and specifics on an international and national scale. In the monography, the author for the first time in the Bulgarian scientific literature analyzes the data on the incidence of osteoporosis and osteoporotic vertebral fractures in different regions of the world and compares it with the data from Bulgaria. Based on his rich clinical experience of 998 patients treated at the Clinic of Neurosurgery of the University Hospital "St. Ivan Rilski " with percutaneous vertebroplasty and kyphoplasty, Assoc. Prof. Karakostov, after a thorough review of the indications and contraindications published and discussed in the world literature, formulates his own criteria for the proper selection of patients who are suitable for these minimally invasive procedures.

In the monography of Assoc. Prof. Karakostov, the description of the surgical techniques of the two percutaneous procedures for vertebral augmentation occupies a central place. The technical implementation of both procedures is critically analyzed and synthesized, which is of practical importance for the neurosurgeons employing them. Based on his own experience and literature data, Assoc. Prof. Karakostov shares his views on the critical stages in the performance of augmentation procedures that would lead to poor surgical results. The summaries and comparisons made by him with a large number of scientific publications give him the opportunity to evaluate his own results with the ones in the literature.

Vascular diseases of the CNS

The vascular diseases of the CNS are another thematic group included in the scientific works of the candidate.

Together with the introduction in the clinical practice of the CT-stereotactic localization of small brain lesions, the author introduces for the first time in Bulgaria the intraoperative localization of small and inaccessible (mainly periventricular and thalamic) cavernous angiomas using a "soft marker". This improves the postoperative results in the cases where the method has been applied (100% totally resected cavernous angiomas without neurological deficit and mortality). (publications № 1.16)

Co-authored the report "Surgical treatment of brain cavernomas long-term results", presented in English at the "13th World Congress of Neurosurgery" in 2005, the author's team summarizes and analyzes their extensive experience, comparing the results before and after the introduction in the neurosurgical practice of the modern high-tech methods such as - frame stereotaxy, neuronavigation and endoscopy. (№ 120)

The co-authorship of Dr. Karakostov in the development of "Clinical presentation and operative results in patients with cavernous vascular malformations" which analyzes the clinical presentation and diagnostic methods in a large cohort of cavernous angioma patients, in which early CT and MRI diagnostics and subsequent microsurgical operative techniques have contributed to a markedly improved

postoperative results.

Of a great value are the publications of the candidate as a co-author "Intraoperative neuronavigation in microsurgical excision of cerebral vascular malformations" which are unique for the country and the first research-study of its kind (publications №29,70,102.)

In recent years, the author has participated in a team led by Assoc. Prof. Sirakov, which introduces and develops endovascular interventional surgery for cerebrovascular pathology. Nine scientific papers have been published in renowned international journals that have a large amount of citations (№ 70,71,72,73,74,76,81,82).

Operative neurosurgery, new diagnostics, intraoperative methods and technologies.

As a result of the residencies of Dr. Karakostov (participation in a project on "The prognostic value of SCSEPs Changes during Intramedullary Surgery" under the guidance of Prof. Vinco Dolenz) he wrote the chapter "Intraoperative monitoring of evoked potentials in neurosurgery" included in the published monography "Modern technological advances in operative neurosurgery" (№6). The academic value of the chapter lays mostly in the concise, clear and informative exposé on the matter and its modern tendencies, which makes it invaluable for students and residents.

Another co-authored publication is dedicated to the modern, minimally invasive field of neurosurgery - the minimally invasive spinal surgery. In the publication "Minimally invasive surgery for lumbar disc pathologies - indications and techniques of microsurgical excision and percutaneous endoscopic discectomy" (№ 9), in addition to a brief historical overview and presentation of the basic microneurosurgical principles and techniques in spinal surgery, the most prominent feature is the new field of "microsurgical percutaneous endoscopic discectomy". A novelty in our scientific field is the development ,with the authors participation, of one of the latest high-tech areas in operative neurosurgery - the frameless stereotaxy (image-guided stereotaxy or neuronavigation). On the topic, everything published by the author's team at home and abroad is the first and only for our academic literature and is of an obviously high contributory value. As a natural continuation of the author's interests from "frame stereotaxy" comes the emphasis on the use and comparative analysis to new and advanced technologies "frameless stereotaxy - (image-guided stereotaxy - neuronavigation)" (publ. № 29,37).

The author's participation in the introduction of a combined operative technique, unifying conventional microsurgery with some advantages of the rigid neuroendoscope in endoscopically-assisted microneurosurgery , is of a contributory nature, enriching the Bulgarian neurosurgical practice (№.22,23,26,37). The use of a rigid neuroendoscope by a team with the participation of the author, allowed the introduction and publication of the methodology and the results of fully endoscopic transsphenoidal surgery of pituitary adenomas (№ 22), as well as endoscopic triventriculostomy in occlusive internal hydrocephaly (№31). Assoc. Prof. Karakostov participated in a project of inter-institutional cooperation between the Department of Neurosurgery of MU-Sofia and the Neurosurgical Clinic in Münster, Germany on "Navigated neuroendoscopy - simulation and clinical application in minimally invasive neurosurgery", followed by a series of publications in connection with (№31.37). In co-authorship and under the guidance of Prof. Romanski, the candidate developed for the first time in the country - in 1996 - the topic of minimally invasive surgical approaches through the horizontal fissure to processes in the cerebellar hemispheres, which allows for the first time a precise and accurate parameters and possible directions of atraumatic approach on deep cerebellar processes (№ 11).

In an interdisciplinary collaboration, the author also participates in the development of a completely new diagnostic method in the country regarding preoperative precise determinantion of the volume, size and neuroradiological characteristics of superficial brain mass-lesions. Based on the study conducted for the first time in the country, the authors conclude that the inclusion of superficial preoperative planning with the help of superficial brain scan leads to a reduced operative duration and less invasive access. (№ 22).

Degenerative spondylodiscogenic diseases

A very prominent emphasis present in most of the author's works are "spondylodiscogenic, degenerative diseases of the spine".
(№3,8,9,14,33,28,34,35,38,69,79,80,83,89,91,92,93,95,97,99,100,103,105,106,107,109,123,125,127,129)

The author publishes and participates in the publication of a series of scientific papers dedicated to degenerative disc pathology, introducing and promoting for the first time in the country the methodology of intradiscal "graft" prosthetics with "cage". The report "The Disc Height Spondylotic Myeloradiculopathy: Clinical Significance And Chances For Correction" at the third meeting of the Spine Experts Group (2005), reflects the significant experience of the author and the staff of the Neurosurgery Clinic in the application of intradiscal "graft" prosthetics in the cervical and lumbar regions. In many of the author's scientific works we can see the emphasized desire to popularize and put into practice the latest operative techniques and technologies in the treatment of degenerative disc pathology. (№ 47,50,51,54,63,65,67,72,73,74,75,76,81.)

The reports - "Evaluation of percutaneous discectomy for the treatment of lumbar disc disease" (№ 93), and "Mini-invasive surgery of the lumbar spine: the choice between microdiscectomy and percutaneous discectomy" (№ 92), presented in English on "18th European Congress Of The Federation Of Surgeons" in 1993, present the scientific and practical achievements of the author and the team to which he belongs.

The reports presented in English at the 3rd International Meeting of the Spine Experts Group in 2005 - ""The "ipsi-contra" technique for treatment of degenerative lumbar spinal stenosis - surgical and radiologic results"" , and "Mistakes And Failures Of Toracolumbar Stabilisations", worthily demonstrate the current level of scientific and practical achievements of spinal surgery in Bulgaria and their scaling to European standards. (№ 125,128)

CNS malformations and hydrocephaly

Modern surgical methods for the treatment of hydrocephaly do not occupy a significant but rather concise and accurate place in the works of the candidate. The author, as part of a team participates in the study and synthesizes the results of a study on the diagnosis and surgical treatment of "normal-pressure hydrocephaly". The article "Neuroendoscopic diagnosis and treatment in adult patients" presents and analyzes for the first time in the country, the application of purely endoscopic and endoscopically assisted neurosurgical interventions in patients who underwent triventriculostomy for internal (occlusive or normotensive) hydrocephaly and aqueductoplasty in patients with aqueductal stenosis. The development is the first of its kind in the country and has an original contributory nature, as it presents the experience of the application of the most modern endoscopic-microsurgical techniques in the intraoperative diagnosis and treatment of internal hydrocephaly. (№ 23.30) Scientific works on "Factors influencing the effectiveness of third ventriculostomy", "Endoscopic treatment of symptomatic deep midline cysts in adults" and "Our clinical experience with CT-guided and computer assisted stereotactic procedures with endoscopic control for cerebral lesions" are of original contributory nature. (№ 31,42,44)

Neurotrauma

In the author's earlier works, the problem of neurotraumas is developed. (№ 85,86,87,90,91). Here the author extensively presents the classification, pathogenesis, pathophysiology and clinical presentation of traumatic injuries of the central and peripheral nervous systems, focusing mainly on the timing, indications and surgical techniques for treatment.

History and theory of neurosurgery

In the article "Stereotaxy - history and development" for the first time in the country the author examines in detail the stages of creation, development and progress of the "frame-stereotaxy technique", as well as the popularization of the Bulgarian scientific contribution to this development ,in which the author holds a leading role. (№ 29, 79)

Epilepsy and functional neurosurgery

Epilepsy and functional neurosurgery are present in the research works of Assoc. Prof. Karakostov. The stereotactic framework of Lexell pioneered by him in the country is the basis for the introduction of the technique for deep brain stimulation (DBS) in Bulgaria. The methodology for the treatment of patients through the application of deep brain stimulation in the country was introduced in 2013 and became a routine neurosurgical practice.

One of the articles (№ 49) presents the first ten cases of drug-resistant epilepsy that were operated on during this period.

At the beginning of 2008, as part of a team, Assoc. Prof. Karakostov shared the initial experience of the introduction of "awake craniotomy" in three patients with epilepsy (№49,66). which allows mapping of functionally important zones and establishes their relationship to the epileptogenic area (lesion). The results achieved that way allow seizure control without causing a neurological deficit, even in lesions that are located in close proximity or are involved in functionally important zones - most often the speech zone.

Casuistic pathology

In the academic works of the author there are also interesting for the scientific world publications on casuistic pathology such as the report about "Cerebral cryptococcosis- description of three cases" by main author Assoc. Prof. Popov.

Very interesting and of great value is the publication on "Primary lymphomas of the central nervous system in immunocompetent patients - a report of two cases" (№79) due to the urgency of the problem in patients with hematologic and oncologic diseases, which are indicated for neurosurgical treatment.

As part of a research team led by Prof. Ya. Enchev, Assoc. Prof. Karakostov published an extremely rare case of a giant, idiopathic epidermoid cyst in the PCF, "Posttraumatic giant extradural intradiploic epidermoid cysts of the posterior cranial fossa: case report and review of the literature, "- published in J Korean Neurosurg Soc, which has been cited 18 times so far.

Participation in research projects

Assoc. Prof. Karakostov participates in two international and one national research project:
"The prognostic value of SCSEPs Changes during Intramedullary Surgery." 1988
"Clinical study of the drug "Temodal" in patients with glioblastoma multiforme." 2001- 2002
"Vertebral disc surgery. Epidemiological data and surgical complications." 1990-1991

Tutoring activity

Assoc. Prof. Karakostov has many years of tutoring experience. From the presented certificate for his scientific and tutoring activity from MU-Sofia it is evident that he holds systematic lecture courses and exams for Bulgarian and foreign students at MU-Sofia. He also trains postgraduates and doctoral students in neurosurgery programs, as well as annual teaching and methods related to the development of lectures, tutoring aids and research projects.

Assoc. Prof. Karakostov has prepared as a supervisor two of his PhD students, who have successfully defended their thesis for the achievement of acedemic degree "Doctor, PhD" in the scientific field of "Neurosurgery".

Medical And Diagnostic Activity

Assoc. Prof. Karakostov is an established and proven neurosurgeon with over 35 years of experience, received his recognition both among patients and the medical community in the country and abroad, with extremely good and sustainable results in his overall neurosurgical work.

Conclusion

The research, tutoring and diagnostic-treatment activity of Assoc. Prof. Vasil Hristov Karakostov, MD,Ph.D. demonstrate that the candidate meets the minimum required criteria for acquiring

the academic degree "Professor", according to the applicable Law and the Regulations for its application of the Medical University - Varna.

I give a positive vote for Assoc. Prof. Vasil Hristov Karakostov, MD, Ph.D. to be awarded the academic degree of "Professor" in the scientific field of "Neurosurgery" for the needs of the Department of Neurosurgery and ENT Diseases at the Medical University of Varna.

19.10.2020 Prof. Yavor Enchev, MD, PhD, DrMedSci, MHA, FRCS(Eng)