

SUMMARY

CEREBRO-SPINAL TUMOR AND VASCULAR INJURY RESEARCH

This habilitation thesis reflects my scientific, professional and academic activity performed after obtaining the title of Doctor of Medicine with the thesis "Clinical, imaging and surgical aspects of intra-extramedullary tumors" in 2008, a title confirmed by M.E.N. Nr. 3030 of 13.01.2008.

Even from the beginning of my career, my scientific activity has focused on two major areas of research: tumor and cerebrovascular pathology. So far, I have published three books as first author and 3 more as main author or co-author, four chapters as first author in collective volumes, one of which in a prestigious international journal. I have published 24 articles in ISI journals with impact factor, resulting in a cumulative impact factor as main author of 44,182. My list of publications also includes 15 BDI articles, 11 of which I am the first author.

My professional activity is based on the university studies conducted between the years 1990 up to 1996, when I graduated from the University of Medicine and Pharmacy in Târgu Mureș, followed by the National Residency Exam, which led me in the position of resident Neurosurgeon. During my specialist career and later as primary care physician at the Neurosurgical Department of Târgu Mureș, I performed more than 5,000 surgeries (approximately 1,200 brain tumors, 150 intra and extramedullary tumors, over 100 clipped aneurysms, over 30 arterio-venous malformations).

My constant concern at our Neurosurgical Clinic was the implementation of new surgical techniques and the purchase of new equipment necessary for performing neurosurgical interventions in maximum safety conditions. In this spirit, in 2015 we introduced the concept of brain surgery without the use of a spatula (dynamic retraction technique), followed in 2018 by the first minimally invasive endoscopic intervention for skull base tumors, we introduced the use of the supracerebellar-infratentorial approach (sitting position) for pineal region pathologies. The neuronavigation system was introduced as a gold standard in cerebrospinal pathology. The first stereotaxic biopsies were performed and in 2016 intraoperative image injection was used for the first time in Romania (first time used in Romania and Europe, CaptiView-Leica technique). Another important academical and professional concern in my work is to promote the multidisciplinary concept, having a close collaboration with anatomical pathology, neurology and interventional radiology. In this regard, I promote multidisciplinary treatment (mixed techniques, for example endovascular-surgical), following interdisciplinary discussions, especially in cases of cerebrospinal vascular pathology (cerebral aneurysms and arteriovenous malformations).



From the didactic perspective, I managed to introduce the discipline of Neurosurgery as an independent discipline in the compulsory education curriculum for the 5th year (Faculty of Medicine), I edited a course of neurosurgery, I managed to broadcast from the operating room via live streaming, and we created one of the largest online databases (over 5000h of HD video images, totaling over 1300 patients).

This habilitation thesis includes the description of the main areas of research that I have approached and that have preoccupied me over time: a) anatomical details, surgical technique and features of cerebrospinal tumor pathology, as well as the description of some clinical cases, such as pleomorphic xanthoastrocytoma (which accounts for less than 1% of all primary brain tumors, a tumor introduced into the World Health Organization classification system only in 1993) or periodic hypokalemic paralysis, in which multidisciplinary treatment neurosurgery-neurology-intensive care performed in a timely manner, led to full recovery for the patient; b) cerebrovascular pathology, where we insisted on the importance of multidisciplinary treatment (neurosurgery-interventional radiology); c) particular imaging and positioning aspects encountered in current practice - features which lead to successful surgeries by using the great amount of preoperative imaging information for planning an optimal trajectory to the area of interest by correctly positioning the patient.

Accumulating over twenty years of experience in the field of Neurosurgery, I hope that this new stage of my university career will create the optimal framework in the realization of high scientific quality doctoral theses.

Associate Professor Bălașa Adrian