

## **Deep Brain Stimulation for Parkinson's disease –Initial Neurosurgical Experience in Varna, Bulgaria**

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In 2019 the Bulgarian healthcare system initiated reimbursement of the deep brain stimulation (DBS) treatment for patients diagnosed with Parkinson's disease and dystonia. The high price of this treatment and the significant number of patients in the Bulgarian waiting list underline the importance of a diligent approach to target localization and operative technique in the performance of this procedure.

From October 2019 to September 2020 bilateral STN stimulation (DBS treatment) was performed on six patients diagnosed with Parkinson's disease in the Clinic of Neurosurgery, University Hospital "St. Marina"- Varna, Bulgaria. Initial cases were performed with the active support of the neurosurgeon Prof. I. Balas and the neurologist Prof. N. Kovacs from University of Pecs, Hungary.

The procedure was performed following all technical guidelines. Leksell Stereotactic System/frame Elekta® was used to obtain stereotactic CT scans. Image guided navigation Medtronic's StealthStation S7® was applied to merge the preoperative 3T MR images with the stereotactic CT scans. Medtronic planning station was employed for direct targeting of the nuclei by visualizing, locating and marking them. The planning workstation provided the details of the targeted nuclei and the entry points as coordinates. Intraoperatively neurophysiological technique of microelectrode recording and stimulation using a fine resolution microdrive was performed. During the stimulation the patients were awake and interacting with the clinical neurologist performing motor and speech tests. The neurophysiological mapping of the targeted STN was enhanced by functional mapping to better localize microelectrode placement within the targeted STN. Medtronic's Stimloc® technology system was used to secure the implanted DBS leads. Activa® (Medtronic) neurostimulator was placed in the left subclavian region (PC in 5 cases and 1 RC).

The result was precise implementation of this technically challenging procedure assuring optimal surgical outcome for all six of the patients.

With the active collaboration of neurologists, neurosurgeons and radiologist was established new state-of-the-art DBS center in University Hospital "St. Marina", Varna.

**Keywords:** Deep brain stimulation, DBS, Parkinson's disease, dystonia, tremors, stereotaxy, MER, Microdrive, Stereotactic Leksell frame, StealthStation S7 navigation system