Posterior subthalamic area deep brain stimulation

- Divide and Conquer: Automatic Detection of the Thalamus to Empower DBS Physiological Navigation to the Subthalamic Region
- Current and Emerging Therapeutic Targets for Essential Tremor: A Critical Appraisal of Recent Preclinical and Clinical Studies
- Bilateral Focused Ultrasound Thalamotomy for Essential Tremor: Clinical Outcomes Compared to Bilateral Deep Brain Stimulation and Probabilistic Lesion Mapping
- Focused Ultrasound as Rescue Treatment of Essential Tremor After Deep Brain Stimulation: 2 Case Reports
- Posterior Subthalamic Area Deep Brain Stimulation Combined with Spinal Cord Stimulation in a Patient with Spinocerebellar Ataxia Type 12
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- Differentiating Postural and Kinetic Tremor Responses to Deep Brain Stimulation in Essential Tremor
- Directional Subthalamic Deep Brain Stimulation Better Improves Gait and Balance Disorders in Parkinson's Disease Patients: A Randomized Controlled Study

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The posterior subthalamic area (PSA), including the prelemniscal radiation and the zona incerta, emerged as a potential new anatomical target to treat ET [1) 2) 3) 4)].

Clinical trials

There is little evidence regarding the possible neuropsychological effects of posterior subthalamic area-DBS on patients with ET, and there are few studies comparing it with VIM-DBS in this population.In this study, Triguero-Cueva et al. aim to present the evaluation protocol and neuropsychological battery as used in an ongoing trial of DBS for ET comparing the already mentioned targets.

As part of a randomized, double-blind, crossover clinical trial comparing the effectiveness and safety of PSA-DBS vs. VIM-DBS, 11 patients with refractory ET will undergo a multi-domain neuropsychological battery assessment. This will include a pre-/post-implantation assessment (3 months after the stimulation of each target and 6 months after an open stage of DBS on the most optimal target).

Evidence on the neuropsychological effects of DBS in patients with refractory ET is very scarce, particularly in lesser-explored targets such as PSA. This study could contribute significantly in this field, particularly on pre-procedure safety analysis for tailored patient/technique selection, and to complete the safety analysis of the procedure. Moreover, if proven useful, this proposed neuropsychological assessment protocol could be extensible to other surgical therapies for ET [5)]

Case series

Three right-handed patients diagnosed with Holmes tremor (HT), who suffered from pharmacotherapy-refractory tremor, were eligible for unilateral posterior subthalamic area deep brain stimulation (PSA-DBS). All patients were evaluated with the Fahn-Tolosa-Marin Tremor Rating Scale (FTMTRS) and Clinical Global Impression scale (CGI) before DBS, 6, and 12 months after the PSA-DBS as well as at the last follow-up. In all patients, we observed a significant improvement of tremor control as demonstrated by changes in the FTMTRS and the CGI scales. Mean improvement of tremor in all patients was 56% for the FTMRTS with a corresponding change in the CGI scale. Our study demonstrates that PSA-DBS is efficacious in the treatment of HT. Indeed, PSA is a promising target for DBS for intractable proximal and distal tremor, even in cases of previous, suboptimal functional neurosurgery. The beneficial effect lasts over a long-term follow-up. PSA-DBS may be considered as an alternative target of DBS in tremor treatment [6].

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