

**One year of brain sensing: a real life experience on the use of brain sense DBS technology in clinical practice**

Massimo Marano<sup>1</sup>, A. Magliozzi<sup>1</sup>, G. Anzini<sup>1</sup>, D. Mei<sup>2</sup>, D. Marruzzo<sup>2</sup>, F.R. Barbieri<sup>2</sup>, V. Di Lazzaro<sup>1</sup>, R. Ricciuti<sup>2</sup>

<sup>1</sup>Fondazione Policlinico Universitario Campus Bio-Medico, Roma, Italy

<sup>2</sup>UO Neurochirurgia, Ospedale Belcolle, Viterbo, Italy

*Introduction:* In recent years deep brain stimulation (DBS) surgery for patients with Parkinson's disease (PD) made substantial technological advancements: first with the availability of directional stimulation (DS) leads, then with the use of local field potential (LFP) in clinical practice. The latter is under current investigation for its clinical utility and for its future application in adaptive DBS [1].

*Objectives:* Analyzing the use of directional brain sense technology (Percept IPG, SenSight leads, Medtronic) [2] in clinical practice through a retrospective analysis of PD patients' medical records collected since April 2022.

*Methods:* Data on disease and therapy, reconstructed lead positioning (SureTune4, Medtronic), and stimulation were collected for 10 STN DBS PD patients out of 14. LFPs amplitude was evaluated through a qualitative methodology (0-3 score) such as the impact of sensing on programming, chronic stimulation, troubleshooting, and event reporting.

*Results:* Mean patient age was  $57.3 \pm 5.3$  (8 males). Follow-up duration was  $6.5 \pm 3$  months. LEDD before surgery vs last follow-up visit was  $1158 \pm 316$  mgs vs  $320 \pm 209$  mgs. The most prevalent STN lead location was centro-medial (45%). 70% of leads were on DS due to mood (50%), motor control (40%), speech (20%) and sensory complaints (10%). Current intensity ranged from 1.6 to 3.5 for ring stimulation (30%) and from 0.7 to 3.1 for directional contact (70%), mean pulse width was  $65 \pm 12$   $\mu$ s and frequency  $130 \pm 20$  Hz. There was a significant interaction between the LFP amplitude and the stimulating contact ( $p < 0.05$ ). The monitored frequency was  $18.8 \pm 4.7$  Hz. Sensing was judged of high relevance (score 3) in 50% programming, in 30% of long-term management/troubleshooting (40% if event reporting was adopted).

*Conclusions:* This study provides real-life insights on new DBS technologies. The use of brain sensing in clinical practice is still questioned, but of utmost importance toward the application of the closing loop stimulation [3].

**References:**

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