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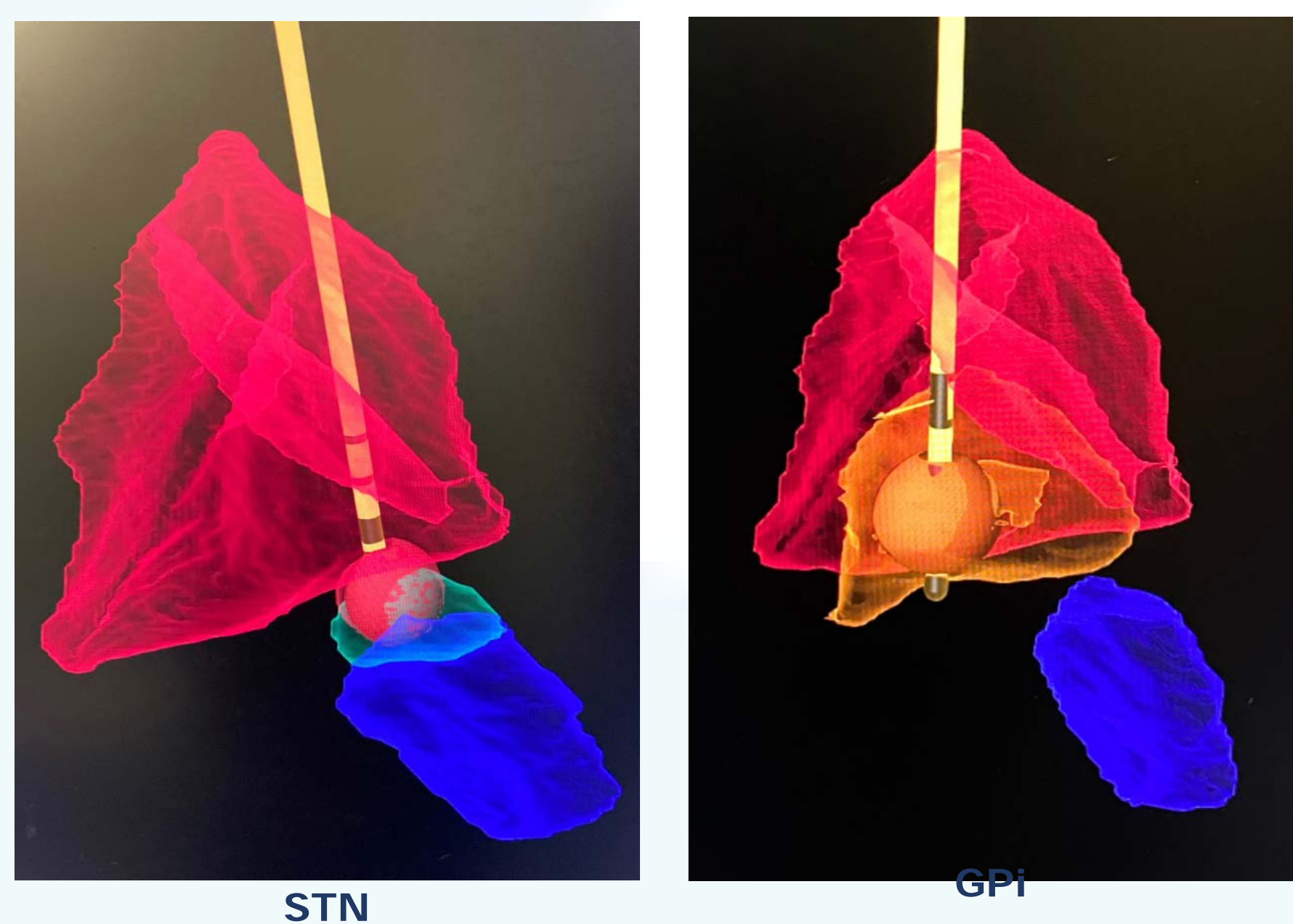
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Objective: To evaluate the effects of deep brain stimulation (DBS) on swallowing function in Parkinson's disease (PD) patients with dysphagia, comparing outcomes between those receiving stimulation targeting the subthalamic nucleus (STN) and those targeting the globus pallidus internus (GPI).

Materials: The study included 14 patients with advanced PD who had previously undergone DBS implantation: 8 with bilateral STN stimulation and 6 with bilateral GPI stimulation. All patients presented clinically significant dysphagia and were recruited from a specialized neurology and rehabilitation center.

Methods: Patients underwent a comprehensive multidisciplinary evaluation involving neurological, speech-language, and otolaryngological assessments. Motor symptoms were assessed using the MDS-UPDRS Part III and Hoehn & Yahr staging. Swallowing function was evaluated clinically with the Dysphagia Outcome and Severity Scale (DYMS) and the Mann Assessment of Swallowing Ability (MASA), and instrumentally via Fiberoptic Endoscopic Evaluation of Swallowing (FEES). Assessments were performed in the medication "on" state during both DBS "on" and "off" stimulation phases. Additional measurements included tongue strength and pharyngeal residue severity rated by the YALE scale.

Results: Fourteen PD patients (8 with DBS-STN, 6 with DBS-GPI) participated in the study (Table 1). In the GPI-DBS group, swallowing function significantly improved during the "on" stimulation phase, demonstrated by a notable reduction in valleculae residue scores on the YALE scale ($p = 0.035$) and a significant increase in tongue strength ($p = 0.025$). Conversely, the STN-DBS group exhibited a significant worsening in pyriform sinus residue scores ($p = 0.039$) when comparing "on" versus "off" stimulation conditions, indicating impaired pharyngeal phase coordination. (Table 2).



All PD patients (10 M/4 F)	
Age at interview	63,4 ± 4,7
Age at onset	47,3 ± 8,5
Disease duration	16,3 ± 8,3
MDS-UPDRS III ON	37,1 ± 10,1

Table 1: demographic and clinical data (means ± SD) of the PD patients

	STN		Gpi		p-VALUE		
	ON	OFF	ON	OFF	STN vs Gpi	Targets vs state	ON vs OFF
MASA	193±8,90	194 ±9,04	194±6,83	194±7,41	0,926	0,927	0,649
ASHA	6,50±0,76	6,50±0,76	6,17±0,753	6,00±1,10	0,339	0,636	0,636
PAS	5,86±0,9	5,86±0,9	6,25±0,0	6,00±0,0	0,582	0,200	0,200
DOSS	1,00±0,00	1,00±0,00	1,00±0,00	1,75±1,50	0,200	0,200	0,200
YALE-va	2,29±1,38	1,71±1,25	1,25±1,89	2,00±1,63	0,648	0,035	0,744
YALE-se	1,14±1,07	1,29±0,95	0,250±0,50	1,50±1,00	0,528	0,087	0,039
Tongue strength	1,38±0,52	1,86±0,38	1,67±0,51	1,60±0,548	0,585	0,025	0,235

Table 2: Mean values and standard deviation of scales and otolaryngological assessments in Parkinson patients (n = 14).

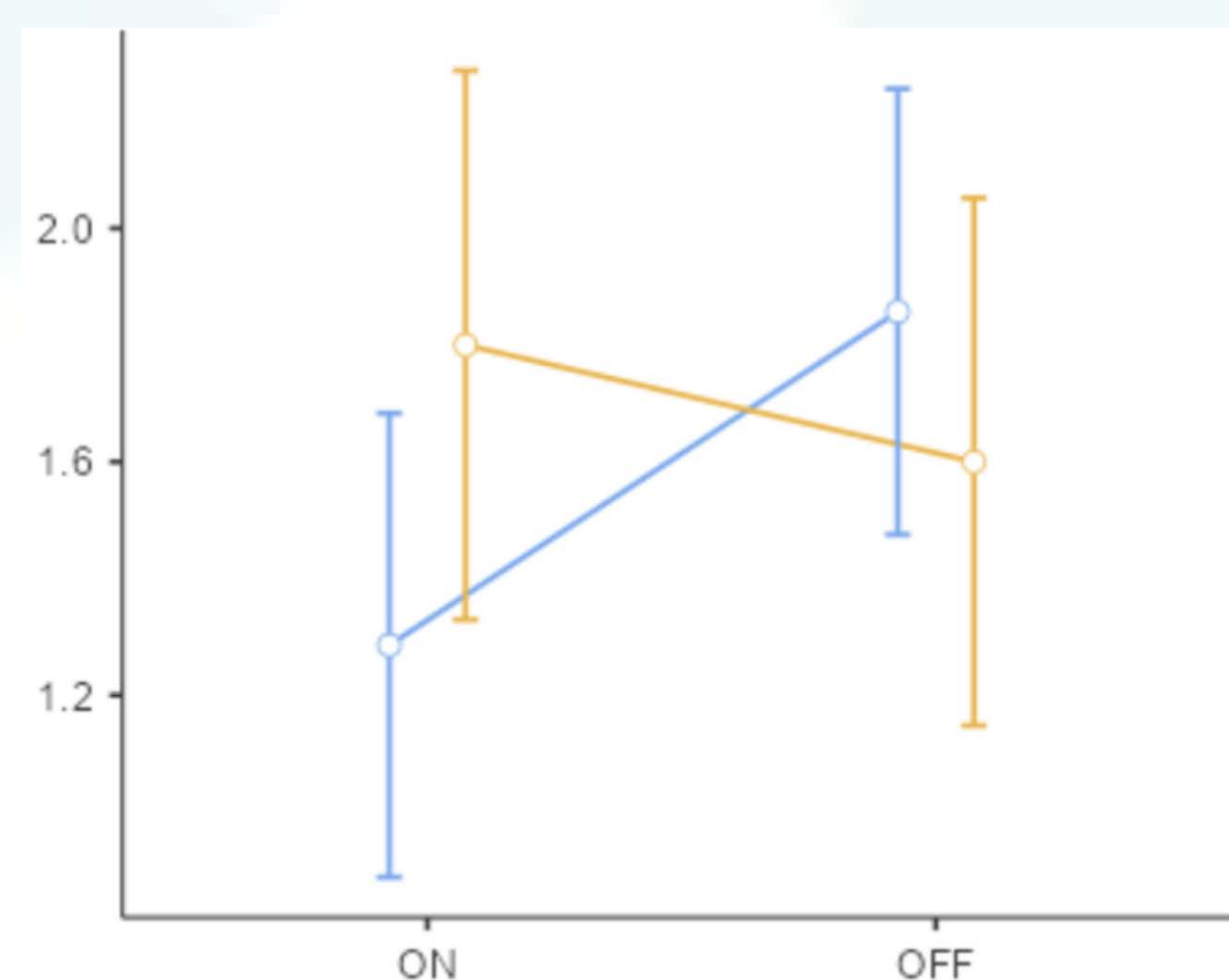


Figure 1: Morpho-functional assessment of tongue strength

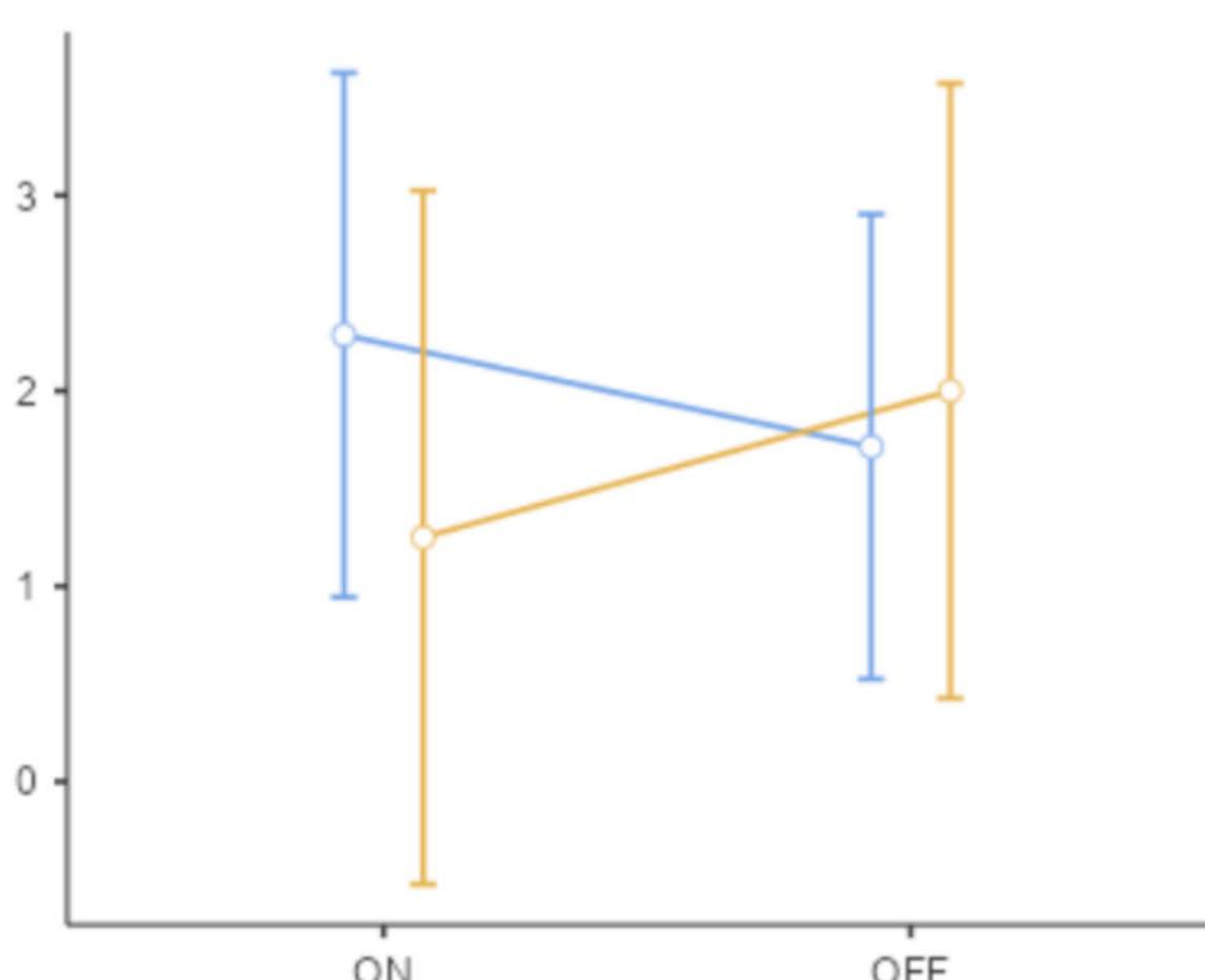


Figure 2: YALE-va scale

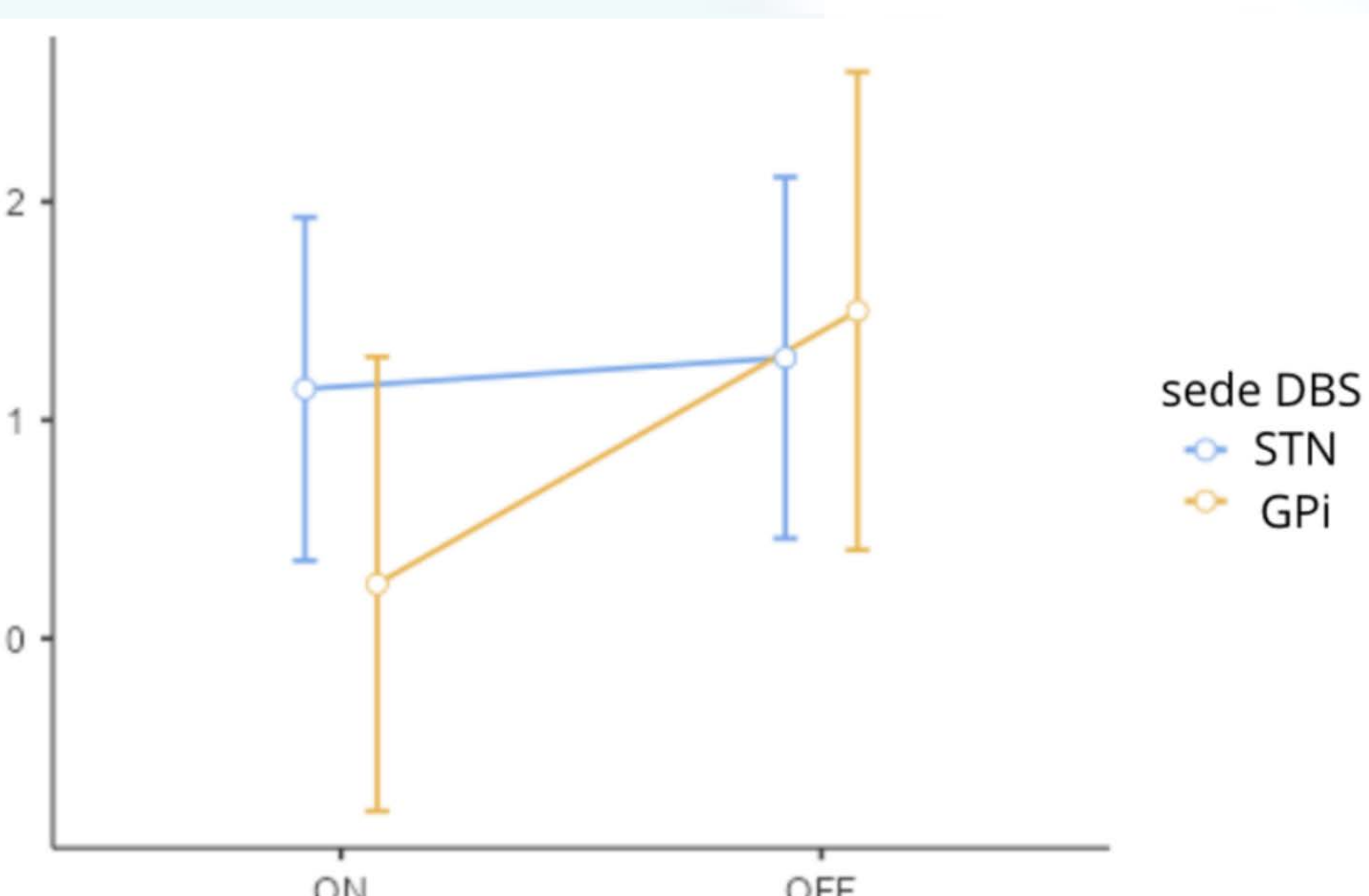


Figure 3: YALE-se scale

Discussion and conclusion: These findings suggest that GPI stimulation may enhance swallowing function, potentially by improving pharyngeal clearance and tongue propulsion. In contrast, STN stimulation may adversely affect specific aspects of swallowing, particularly pharyngeal residue clearance, possibly due to disrupted motor coordination. This highlights the importance of carefully considering DBS target selection in PD patients with dysphagia. DBS influences swallowing function in PD patients, with differential effects depending on the stimulation target. GPI-DBS appears to provide a more favorable safety and efficacy profile regarding swallowing compared to STN-DBS. Larger prospective studies are warranted to validate these preliminary observations and inform clinical decision-making.