

Comparing GPi Lesioning and DBS in Parkinson's: Functional and QOL Impact

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Abstract

Introduction: Lesion-based procedures for Parkinson's disease (PD) have resurged as viable alternatives to deep brain stimulation (DBS), particularly where access to neuromodulation is limited¹. This study compares GPi-DBS and GPi-RF regarding functional outcomes and quality of life (QoL), also evaluating cognitive safety.

Method: A retrospective cohort of 102 patients with idiopathic Parkinson's disease, treated between 2018 and 2022 at a single center, compared outcomes of GPi-DBS (n=46) and GPi-RF lesioning (n=54) with 18-month follow-up. Evaluations included the PDQ-39 and MoCA. Two RF patients could not attend final follow-up but were contacted remotely. The study was approved by the institutional ethics committee.

Result: Both groups showed significant improvements in motor function (UPDRS-III) and overall quality of life (PDQ-39 total) at 18 months. GPi-DBS was associated with greater gains in the mobility domain, while GPi-RF yielded superior improvements in bodily discomfort and activities of daily living. Emotional well-being and cognitive QoL domains improved similarly in both groups, with no significant differences. Cognitive performance remained stable over time in both cohorts. Levodopa equivalent daily dose (LEDD) increased in the DBS group but remained unchanged in the RF group.

Discussion: Both GPi-DBS and GPi-RF effectively improve functional outcomes and quality of life in Parkinson's disease, with distinct profiles. DBS yielded greater gains in mobility, whereas RF lesioning resulted in superior outcomes in discomfort relief and independence in daily activities. The nature of RF lesioning may contribute to earlier clinical effects, particularly in axial symptoms, possibly due to immediate disruption of abnormal pallidal output. In this cohort, DBS did not demonstrate superiority over lesioning in cognition or quality of life domains. The absence of cognitive or emotional deterioration after lesioning, combined with its functional efficacy, highlights lesioning as a treatment strategy that merits consideration within a broader spectrum of care.

Conclusions: This study supports the role of both GPi-DBS and GPi-RF as effective interventions for Parkinson's disease, each with particular clinical strengths. Lesioning, in particular, may be considered a valid therapeutic option within a comprehensive care strategy. Further prospective studies are warranted to optimize patient selection, refine long-term expectations, and advance the technical precision of both procedures.

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