

## A Randomized Trial of Focused-Ultrasound Subthalamotomy for Parkinson Disease

*Treatment resulted in more motor improvement than sham procedures but caused an unexpected number of adverse effects.*

Focused ultrasound, an imaging-guided technique that can be used to create brain lesions, is FDA approved for use in thalamotomy to treat Parkinsonian tremors. To test the technique in *subthalamotomy*, investigators randomized 40 patients (mean age, 58) with markedly asymmetric Parkinson disease (PD) 2:1 to focused ultrasound subthalamotomy (on the contralateral side to their main motor signs) or to a sham procedure. The study was partially manufacturer-sponsored. The primary efficacy outcome was a between-group difference in change from baseline to 4 months in the Movement Disorder Society–Unified Parkinson’s Disease Rating Scale (MDS-UPDRS) motor score. The outcome was based only on the scores corresponding to the side of the body opposite the brain implant.

At 4 months, the mean MDS-UPDRS motor score decreased from 19.9 at baseline to 9.9 in the active-treatment group (least-squares mean difference, 9.8 points; 95% confidence interval, 8.6 to 11.1) and from 18.7 to 17.1 in the control group (least-squares mean difference, 1.7 points; 95% CI, 0.0 to 3.5). The between-group difference was a significant 8.1 points (95% CI, 6.0 to 10.3). Adverse events included dyskinesia in the off-medication state in 6 patients, weakness in 5, speech disturbance in 15, facial weakness in 3, and gait disturbance in 13. In 6 patients (22%), the adverse effects persisted at 12 months.

### COMMENT

In a relatively young cohort of patients with highly asymmetric PD, focused-ultrasound subthalamotomy resulted in significant and positive motor benefits. However, some patients had worrisome side effects. The higher-than-expected adverse event profile may have been related to the decreased targeting accuracy when directing the focused ultrasound lesions into such a small target. Focused ultrasound therapy remains unapproved for the subthalamic nucleus target explored in this study.

— **Michael S. Okun, MD**

Dr. Okun is Adelaide Lackner Professor and Chair of Neurology and Executive Director of the Fixel Institute for Neurological Diseases at the University of Florida McKnight Brain Institute, Gainesville.

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