Prospective study of pallidal deep brain stimulation for treatment of cervical dystonia: TWSTRS intermediate outcome analysis

Krauss J. K., Loher T., Weber S., Taub E., Burgunder J. M.

Neurochirurgische Universitätsklinik, Mannheim, Neurologische und Neurochirurgische Universitätskliniken, Inselspital, Bern, Schweiz

Objective: To study the intermediate outcome of posteroventral globus pallidus internus (GPi) deep brain stimulation (DBS) in patients with severe cervical dystonia (CD) at 1-3 years postoperatively.

Methods: The prospective study protocol included video assessments, the Mini Mental Score, Hamilton Depression Score and a modified Toronto Western Spasmodic Torticollis Rating Scale (TWSTRS) with subscores for total severity, pain and functional disability. Quadripolar electrodes were implanted in the GPi with stereotactic CT and microelectrode guidance.

Results: Five patients with complex CD had an intermediate follow-up ranging between 18-36 months. There were three men and two women. The predominant pattern of CD was: retrocollis/torticollis, lateral shift/tilt, sagittal shift/retrocollis, antecollis, and phasic bilateral torticollis. There were three men and two women. No patient experienced intra- or post-operative adverse events. The TWSTRS subscores were significantly improved at the last follow-up evaluations: total severity decreased from 20.5 to 7.5 (maximal possible score 32), pain from 6 to 3 (maximal possible score 8), and functional disability from 40.5 to 12.7 (maximal possible score 60). All subscores were better on intermediate follow-up than at 3 months postoperatively indicating further delayed improvement with continuous stimulation. One patient had electrode fractures over the long-term requiring reoperation. Stimulation-induced side effects included perioral tightness in all patients which was reversible, however, with modification of the DBS parameters. The IPG parameters were adjusted on several occasions (range 7 to 22 sessions at the last follow-up).

Conclusion: The results of this study confirm and extend our preliminary experience with short-term follow-up in single patients as published earlier (The Lancet). Intermediate outcome analysis shows that pallidal DBS is a safe and effective treatment for patients with severe complex and disabling cervical dystonia.