



Neurosurgical Forum

LETTERS TO THE EDITOR

DBS in elderly patients: neurological challenges versus neurosurgical complications

TO THE EDITOR: We read with interest Wakim and colleagues' single-center retrospective review¹ of 861 adult patients who received deep brain stimulation (DBS) by a single surgeon over his first 6 years of independent practice (Wakim AA, Mattar JB, Lambert M, Ponce FA. Perioperative complications of deep brain stimulation among patients with advanced age: a single-institution retrospective analysis. *J Neurosurg*. Published online February 12, 2021. doi:10.3171/2020.8.JNS201283). Significantly increased risks of postoperative delirium and longer hospital stay were found in the elderly group compared with those younger than 75 years, with twice as many elderly patients requiring transfer to a rehabilitation facility. The elderly group also had increased risk of subdural hematoma (3.4% vs 1.0%) and a trend toward increased intracranial hemorrhage overall (bleeding rate doubled from 3.1% to 6.1%; $p = 0.06$). The authors concluded that advanced age should not be a contraindication to DBS, as evidenced by the majority of patients who underwent surgery without surgical complications.

Although we applaud these robust data derived from a large number of patients who were operated on by one of the busiest DBS neurosurgeons in the world at this time, we wish to emphasize that evidence of minimal additional surgical risk, and thus surgical safety, should not be conflated with evidence of efficacy when deciding to perform DBS in elderly patients. Because DBS is performed for symptomatic improvement rather than life prolongation,² long-term follow-up data on complications, symptom severity, disability, and quality of life, ideally 5 years or more after surgery, need to be carefully explored, in addition to data on immediate surgical complications.

Elderly patients may be at greater risk for delayed surgical complications, such as surgical site infection seeding from systemic infection. Nonmotor symptom burden, particularly neuropsychiatric symptoms, is more common in older patients with movement disorders. Although careful holistic preoperative assessment may mitigate such issues and is vital for patient selection,³ elderly patients are still more susceptible to negative surgical effects on cognition and behavior. Additionally, older patients have a much higher rate of comorbid diseases, including cerebro-

vascular or Alzheimer disease pathology in Parkinson's disease (PD),⁴ thereby potentially shortening the duration of any DBS benefits on functional ability and quality of life and exacerbating refractory axial symptoms such as impairment in speech, gait, and balance. Dysarthrophonia was not discussed by the authors but remains a significant adverse effect of DBS that may be worse in elderly patients. Seemingly paradoxical complications can also occur. Older patients are more likely to develop cognitive impairment, and as this progresses to dementia, enhanced movements due to DBS can paradoxically increase risks of falls and hospital admissions and increase caregiver burden. It is notable that 14.0% of elderly patients had an unplanned admission to a rehabilitation facility within 90 days of surgery versus 7.9% of younger patients.

Isolated tremor syndrome presents the best argument for DBS in elderly patients, because these patients lack the extensive nonmotor symptom burden and rapid decline of patients with PD. We also highlight the potential role for lesioning in these patients (whether with radiofrequency or ultrasound), because this treatment removes the burden of programming, the need for battery changes, and the risk of infection at the site of the neuroprosthesis.⁵

We hope our letter addresses the need for a discussion about the neurological complications of DBS in any study of DBS outcomes, and we encourage the authors to publish their follow-up data on patient-centered outcomes. Coming from such a high-volume surgical center, these outcomes data would be of great value to the DBS community. It would also be interesting to analyze if the surgical complications reduced with time over the 6-year period as the surgeon's experience increased.

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Disclosures

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