

What is the role of psychiatric neurosurgery in the 21st Century?

Neurosurgical treatments are not to be entered into lightly for any indication. It is especially understandable that concerns have been raised regarding the prudence of neurosurgical interventions for psychiatric indications, given the history surrounding the crude freehand procedures arising during the middle of the 20th century.¹⁻³ Early enthusiasm about frontal lobotomies led to widespread and relatively indiscriminate use during the era prior to the advent of contemporary psychopharmacologic therapies. However, the past five decades have witnessed an essential evolution in neurosurgical treatment for severe, treatment-refractory obsessive compulsive disorder (OCD) and major depression (MD).^{1,2} In particular, advances have been achieved with respect to: the standards and practices for patient selection, refinement of surgical methods, evidence of effectiveness, experience regarding adverse effects, and investigation of relevant neuroscience.

Anterior cingulotomy, anterior capsulotomy, subcaudate tractotomy, and limbic leucotomy are now regarded as accepted (non-experimental) treatments for severe and treatment refractory forms of OCD and/or MD.^{1,2} The critical principles of patient selection include informed consent and a process by which multi-disciplinary review of candidate cases ensures accurate diagnosis, sufficient severity of illness, assessment of potential contraindications, and that an exhaustive array of non-surgical therapies have already been tried and failed. Data have accrued to indicate modest response rates (35 - 70% depending on the patient sample and criteria for response), which can be life saving in these most severe and otherwise treatment unresponsive cases of OCD and MD. Clinical improvement is typically achieved over several weeks to months post-operatively, and for some of these procedures, repeat surgery is an option in the face of incomplete response. Anticipated temporary post-operative discomforts include headache, nausea and edema. The risks of more serious adverse events, including infection, urinary difficulties, weight gain, seizures, cerebral hemorrhage or infarct, and cognitive deficits, are real, but estimable, relatively infrequent, and usually transient.^{1,2,4} As with any therapeutic options, the available detailed information regarding potential risks and benefits comprise essential elements of the informed consent process. Under no circumstances should psychiatric neurosurgery be performed against a patient's will or in the context of coercion. Further, as neurosurgical inter-

vention should not be considered a substitute for psychiatric care, arrangements for ongoing post-operative treatment under the supervision of a psychiatrist is required.

It is important to keep in mind that different standards exist for establishing medical (e.g., pharmacological) vs. surgical treatments as effective. Whereas the gold standard in pharmacotherapy requires double-blind placebo-controlled trials, in contrast, for surgical therapies, these ideals are rarely pursued and not required nor even expected, owing to the practical challenges surrounding sham-control and blinded intervention in the surgical context. In the case of psychiatric neurosurgery, as with many widely accepted neurosurgical treatments for medical or neurologic conditions, the clinical data regarding effectiveness have been gleaned from extensive clinical experience gathered openly. Further, for the psychiatric neurosurgical experience accrued, the likelihood of substantial placebo response or coincident spontaneous remission rates seems remote given the lengthy duration of illness and prior heroic breadth of alternative unsuccessful treatments.

The advent of stereotactic procedures and guidance using magnetic resonance imaging have led to a much refined ability to accurately place lesions at desired target locations. These ablative procedures are typically performed using conventional neurosurgical methods for thermocoagulation via craniotomy. However, anterior capsulotomy can alternatively be performed using the Gamma Knife - an apparatus which enables neurosurgeons to produce targeted lesions within the brain via directed gamma radiation through the intact skull, hence obviating the need to perform a craniotomy.^{1,2}

These contemporary psychiatric neurosurgical treatments for OCD and MD are to be conceptualized as non-experimental; nonetheless research should continue in this area in an effort to further delineate or improve outcomes, investigate alternative methods or indications, and to advance scientific understanding of these diseases and the mechanisms by which neurosurgical treatments have their effects. In fact, neuroimaging research has already substantially influenced the working neurobiological models of MD and OCD.⁵ Perhaps most exciting is the prospect that functional neuroimaging tests might be developed to help guide optimal clinical care, by informing selection among patients or among neurosurgical options.^{5,6} Likewise, the development of deep brain stimulation techniques

offers the potential for replacing current ablative procedures with interventions that are flexible, adjustable, and reversible.^{2,7} For now, however, the gold standard established neurosurgical treatments for OCD and MD remain: anterior cingulotomy, anterior capsulotomy, subcaudate tractotomy and limbic leucotomy.

We maintain that, at this time in the 21st century, neurosurgical treatments for severe and treatment-refractory OCD and MD represent a viable set of options in appropriate clinical situations. These treatments should be considered rationally and made available, by skilled, experienced, multi-disciplinary teams of psychiatrists, neurosurgeons, and neurologists, to such patients who can render informed consent in this regard. Consequently, we support and applaud policies that encourage or ensure the responsible conduct of psychiatric neurosurgical treatment. Conversely, we are opposed to policies that, by design or in practice, deny appropriate patients access to these treatment options. Worldwide there is a long and tragic history of stigmatizing mental illness and denying fundamental rights to individuals suffering from psychiatric conditions. While sometimes couched in terms of "protecting" these unfortunate individuals, denying people with psychiatric diseases the right

to access and choice among available appropriate treatment options is just such a violation of rights. Most specifically, in cases where patients with psychiatric diseases have the capacity to render informed consent, they must be allowed access and informed choice, with a benchmark for parity being the analogous neurosurgical treatment of patients with neurologic or other medical conditions.

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