

## Preface

# Surgery for psychiatric disorders



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Surgery for psychiatric disorders has intrigued the psychiatric, neurological, and neurosurgical communities as well as the lay public for the past 70 years. Few other therapies have generated such controversy, enthusiasm, misconception, and, at times, indiscriminate use. Recent advances in image guidance, devices, and stereotactic procedures, as well as rapid expansion of our knowledge of the functional neuroanatomy of the major psychiatric disorders has led to renewed interest in neurosurgical approaches to these conditions. This issue of the *Neurosurgery Clinics of North America* was envisioned with the purpose of compiling the perspectives of experts on the cutting edge of research in the neurosurgical treatment of psychiatric disorders.

Currently, the two most common psychiatric disorders amenable to surgical intervention are obsessive-compulsive disorder (OCD) and major depression. OCD affects 4 to 7 million people in the United States at an annual cost of \$8 billion per year and was among the 10 leading medical or psychiatric causes of disability in developed countries (1998 World Health Organization study). Conservative estimates of the lifetime prevalence of major depression are from 2.6% to 5.5% in men and 6.0% to 11.8% in women. Approximately 50% to 85% of patients with major depression experience recurrent episodes of illness. In addition to subjective distress, the disorder can be a cause of profound disability, with pervasively

negative effects on marital, parental, social, vocational, and other life functions.

Advances in the efficacy, safety, and tolerability of treatments for OCD and depression have been made in the past 20 years. However, a significant number of patients with OCD and major depression refractory to nonsurgical treatments remain severely ill. These individuals, who are living lives of hopeless desperation, may ultimately face the tragic end of suicide. The hope that surgery can offer relief to these patients from agony and suffering is the fundamental imperative that demands ongoing research in this area.

It is clear that psychiatric neurosurgery will undergo a rapid evolution over the next decade. Today, dedicated multidisciplinary teams specializing in treating psychiatric patients have at their disposal the entire spectrum of modern functional neurosurgical techniques, including lesioning, radiosurgery, and neurostimulation. Advances in our understanding of the functional neuroanatomy and electrophysiology of the relevant circuitry underlying these conditions will increasingly guide placement of lesions or deep brain stimulation (DBS) electrodes. To promote further growth in this field, centers with psychiatric and surgical expertise must design studies that are prospective and randomized, using reliable and validated diagnostic and evaluation tools that measure changes in symptoms and quality of life.

To critically examine neurosurgery for psychiatric disorders, we must start by carefully examining the past. Kopell et al provide a historical perspective that reminds us of the complexities of psychosurgery and an enduring caution for the future. These historical endeavors were limited by a lack of scientific rationale and other limitations such as surgical techniques and devices, vague patient selection, indiscriminate use, and nonstandardized evaluations. In spite of the decline of surgery for psychiatric disorders since the 1950s, early studies of stereotactic lesioning demonstrated significant improvements in symptoms of patients with major depression and OCD with few cognitive or neurological side effects. Current stereotactic methods, using considerably smaller and more precisely located targets, have much lower morbidity. Neuroimaging research has focused attention on the relationship between activity in specific neuroanatomical networks and psychiatric symptoms and on changes after effective treatment. The articles by Rauch and Greenberg et al provide an overview of the scientific foundation and the emerging therapeutic strategies being explored today.

The articles by Greenberg, Cosgrove, and Chang et al consider the evidence for the safety and efficacy of lesioning procedures. The evidence has definite limitations but nevertheless sheds light on critical issues in assessing the long-term effectiveness and morbidity associated with anterior cingulotomy, anterior capsulotomy, subcaudate tractotomy, and limbic leucotomy. Jeanmonod et al describe a novel lesioning approach to neuropsychiatric disorders based on recent evidence related to thalamocortical dysrhythmias that their group have shown are present in these conditions. Nuttin et al present recent data on the use of DBS technology for the treatment of OCD.

Two additional novel somatic treatments for refractory depression have also been the subject of systematic study over the past decade. George et al review the neurobiologic rationale and summarize treatment outcome data for transcranial magnetic stimulation, while Carpenter et al review similar evidence for vagal nerve stimulation.

Given the past history of the field, it is particularly important that research in this area move forward on a solid scientific and ethical foundation. Collaborative efforts between centers with dedicated multidisciplinary teams of psychiatrists, neurosurgeons, and basic scientists are needed to develop treatments with proven efficacy and safety before the premature introduction of these procedures into routine clinical use. In this context, we have included an editorial reprinted from a recent publication of the OCD-DBS collaborative group in neurosurgery that focuses on recommendations for future research efforts in this area. Finally, any publication focusing on surgery for psychiatric disorders must include a thoughtful discussion of the ethical implications of these procedures. Fins et al offer a careful and considered review of the ethical issues in this field, including issues of informed consent.

Together, these articles provide a comprehensive overview of the current state of surgery for psychiatric disorders and the complex issues surrounding the re-emergence of this field. They represent a window into what promises to be an exciting future for the development of novel neurosurgical approaches to psychiatric disorders that are based on the neurobiologic basis of these conditions.

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