Deep brain stimulation for cervical dystonia

I read with interest the recent case report by Chang and colleagues on unilateral deep brain stimulation (DBS) of the globus pallidus internus (GPI) in a patient with delayed-onset posttraumatic cervical dystonia.1 I congratulate the authors reporting another patient treated with GPI DBS. The unique feature in their case is that unilateral stimulation only was used. They report on a 23-year-old man who developed cervical dystonia with head turning to the left three years after he sustained a severe closed head injury. Magnetic resonance (MR) studies five days after the injury demonstrated focal lesions of the left pallidum, but also of the right thalamus. Six years later only the left pallidal lesion could be appreciated by MR studies. The authors chose to implant a quadripolar DBS electrode in the left GPI for chronic stimulation. They further report that during chronic stimulation the patient’s cervical dystonia improved, and that he could turn his head to the midline easier than preoperatively. The improvement was not assessed by standard rating scales for cervical dystonia, but by the patient’s perception.

I was surprised to see that these authors concluded that cervical dystonia in this patient was caused by focal lesions of the left pallidum. Posttraumatic cervical dystonia may be associated with subthalamic and upper brainstem lesions.2

Interestingly, Chang and colleagues conclude on the side to be chosen for unilateral DBS are at odds with another recent case report. Escamilla-Sevilla and colleagues observed improvement of segmental cervical and trunci dystonia in a 24-year-old man with idiopathic dystonia during unilateral stimulation of the right GPI ipsilateral to the dystonic sternocleidomastoid muscle.3 In that case no notable change of cervical dystonia was observed with bilateral stimulation for six months. When it then was decided to switch to unilateral stimulation of the right GPI there was progressive improvement over the next three months. Unfortunately, chronic stimulation of the left GPI was not performed in that case. These authors concluded that stimulation should be started on the side ipsilateral to the dystonic sternocleidomastoid muscle.

The discrepancy between these two reports reveals the problems inherent in conclusions made from single case reports. It also reminds of the historic discussions decades ago, when Cooper thought that thalamotomies performed on the side contralateral to the dystonic sternocleidomastoid while Hassler stated that ipsilateral lesoning would be more beneficial.4 When we introduced the concept of GPI DBS for cervical dystonia in 1997 we discussed several alternatives regarding the choice of the target and also whether unilateral or bilateral DBS should be used.5 We then decided to go ahead with bilateral stimulation for several reasons, based on contemporary imaging studies and also accumulating knowledge on the innervation of neck muscles. Magyar-Lehmann and colleagues, for example, showed that patients with cervical dystonia had higher glucose metabolism bilaterally in the lentiform nucleus in a PET study without significant differences regarding the laterality, the specific pattern, or the severity of cervical dystonia in individual cases.6 Naumann and colleagues also demonstrated bilateral basal ganglia involvement in cervical dystonia patients by striatal D2-receptor binding studies.7 In that study, there was no significant difference by intraindividual comparison of contralateral versus ipsilateral striatal epi- pride binding with regard to the direction of head rotation. In a recent transcranial magnetic stimulation study in normal subjects, ipsilateral as well as contralateral sternocleido- mastoidic stimulation study in normal subjects, ipsilateral as well as contralateral sternocleidomastoid responses were evoked by stimulation of an area of cortex near the representation of the trunk.8 With that regard, however, it is also important to consider that head rotation in patients with cervical dystonia is not only due to contrac- tion of the sternocleidomastoid, but also of the posterior neck muscles. In our series of patients who underwent bilateral pallidal DBS for treatment of cervical dystonia we have repeatedly observed clinical deterioration due to misalignment of the right GPI and the right thalamus.

The study on Chang et al.8 is interesting, but we have repeatedly observed clinical deterioration with the battery only on one side.

The following are some key points from the literature:

1. Failure of regular external ventricular drain exchange to reduce CSF infection

Dr. Wong and colleagues undertook quite a careful prospective randomised trial aiming to determine whether routine changing of external ventricular drainage catheters reduces the risk of CSF infection.9 Patients were randomised into two groups: group 1 (n = 51) had routine changes of the external ventricular drainage catheter at five-day intervals; in group 2 (n = 52) the ventricular drain was not changed. There was no difference with respect to the basic demographic data and the incidence of CSF infection. The authors observed four CSF infections in group 1 (7.8%) and two in group 2 (3.8%). Despite the higher CSF infection rate in group 1, this difference was not statistically significant. Based on their results, the authors concluded that “altering the time of reducing external ventricular drainage catheters at five day intervals did not reduce the risk of CSF infection”.10

The topic of ventricular catheters and the risk of CSF infection has been dealt with in numerous reports. The continuing need for ventricular catheters is largely based on the fact that quite controversial recommendations

References
have been published regarding the use of external ventricular catheters. In general, our experience with CSF infections is similar to that of Wong. We investigated which factors increase the incidence of CSF infections in a prospective study including 133 patients who underwent 152 surgical procedures for external CSF drainage. Assessed variables included basic demographic data, with special reference to the duration of surgery, diameter of the catheter used (5 F or 10 F), distance of the subcutaneous tunnel between the burr hole and the cutaneous exit point, additional surgical procedures, and duration of CSF drainage.

In our study group we had a CSF infection rate of 4.5% per patient and 3.9% per surgical procedure. Whereas most of the variables assessed showed no statistically significant correlation with the incidence of CSF infection, interestingly we observed a close correlation between the length of the subcutaneous tunnel and the incidence of infection. In 83% of the patients with CSF infections the catheter was tunneled subcutaneously for less than 5 cm, whereas in only 17% was the catheter tunneled for more than 5 cm. This observation was associated with the fact that there was a higher incidence of CSF leakage through the cutaneous exit point with shorter tunnels despite correct operative management. Taking into consideration that in the study by Wong et al. all of the bacteria are common in the skin flora of patients in the intensive care unit and “all infections occurred after day 10” (mean 13 days), these findings strongly support our observation of increased CSF infections caused by secondary contamination rather than as by contamination during the catheter placement procedure.

In agreement with Dr. Wong, we do not recommend routine replacement of the ventricular catheter, but based on our data we strongly recommend a sufficient length of subcutaneous tunnelling (5 cm or more) to reduce the risk of CSF infection, because despite efficient antibiotic treatment a CSF infection is still a serious complication and must be avoided.

References


Author’s reply

We were pleased to see the above letter about the importance of tunnelling. Subgaleal or subcutaneous tunnelling of ventricular drains has been accepted since the late 1970s as a way of reducing ventriculostomy related CSF infections. In accordance with this concept, our protocol is to use a tunnel of 4 cm or more as necessary. It is gratifying to see recent confirmation of this in the correspondents’ own series. Our own low CSF infection rate in the “no change” group (3.8%) in such a high risk group of patients further supports this concept. There is still much debate on what constitutes the most favourable tunnel length. Some would advocate a short tunnel of 4.5 cm, whereas others prefer the tunnel to reach the lowest costal thoracic abdomen. All of these documented series, including our own, had a low CSF infection rate of 3–4%, giving a long average duration of catheter placement of 11 to 18 days. In Khanna’s series the change to a long tunnel appeared to contain the infection rate, giving an average of 18.3 days for an indwelling catheter. In cases where a long duration of catheter placement is likely, conversion to a long tunnel may be advisable, both to reduce the infection rate and for convenience in mobilisation.

The concept used in our paper of relating the number of ventricular catheter insertions to the CSF infection rate diverges with earlier series as well as that of the correspondent. It is important to investigate the possible pathogenesis and to consider viable means of achieving improved results. Results from our own data indicate that the source of infection is bacteria found in the patients’ own skin flora. Regular changing of the catheter (which in theory should reduce the opportunity for colonisation pending to infection) has not only failed to reduce infection but may even have increased it. Tunnelling may be helpful in preventing colonisation from progressing to infection. Most infections appear to be caused by resistant skin flora introduced at the time of the procedure, despite the use of standard aseptic technique and prophylactic antibiotic cover. Regular audits to ascertain the MRSA status of both the intensive care unit and operating environment are therefore of great importance.

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References


Author’s reply

The interest and comments of Audenino et al are greatly appreciated. In our paper, 48 patients who were suspected of being in NCSE were evaluated prospectively by neurology residents; the diagnosis was later confirmed or ruled out on the basis of the patient’s EEG. Remote risk factors for seizures (such as previous stroke, neurosurgery, significant head trauma), impaired mental status, and comorbidities were assessed. Patients with known epilepsy presenting with prolonged confusion after convulsions, an urgent EEG is warranted to distinguish between postictal encephalopathy and generalised NCSE. Kaplan reported that the diagnosis of NCSE was initially missed in the emergency room when the behavioural or cognitive changes from baseline were ascribed to other causes, including intoxication, postictal encephalopathy, pre-existing psychiatric conditions, or mental retardation. In our study, the delay in diagnosis of NCSE ranged from three hours to 28 days, with a mean of three days. In two patients the diagnosis was delayed despite an emergency EEG, because of the lack of clear epileptiform features in the EEG abnormalities. A suspicion of NCSE is the most important clinical indication for performing an emergency EEG. Because of the different EEG patterns and the peopomorphic clinical features, a diagnosis of NCSE is possible with an expert integration of EEG findings and clinical data, as emphasised by Niedermeyer and Ribeiro.

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References


Audenino et al present their series of 50 patients, all of whom met their criteria for NCSE. In their series, like ours, women outnumbered men. They note that there are “no peculiar clinical features of NCSE.” They also suggest that all alterations of behaviour for which there is no alternative explanation should be evaluated with an urgent EEG.

I agree that for all patients with an altered sensorium, NCSE should be considered as a possible diagnosis. Furthermore, there is general agreement that an EEG is required for the diagnosis of NCSE. In our study it was also noted that the presence of a metabolic or other type of encephalopathy did not necessarily imply exclusion of NCSE. Thus should urgent EEG be requested for all patients with altered mental status, regardless of comorbidities? No; this is impractical not only after working hours, but also during working hours in most hospitals. Therefore, we attempted to triage patients who should be getting an urgent EEG. This can be accomplished on the basis of the high sensitivity of the above findings. This high sensitivity should not be mistaken for high specificity; in fact the specificity was low. A valid criticism would be the low specificity, but our objective was not to find an alternative to EEG for the diagnosis of NCSE, but rather to triage those in need of one.

Another important difference between Audenino’s series and our own is that ours was obtained prospectively. A prospectively obtained neurological history and examination is likely to be more detailed than information obtained retrospectively from a review of the clinical records. A history of remote risk factors for seizures and the presence of an encephalopathy should not be missed during an urgent neurological evaluation unless specifically sought.

I would like to emphasise again that the objective of this study was not to find alternatives to EEG in the diagnosis of NCSE, but rather to help select those who should have an urgent EEG. Performing an urgent EEG on every patient with alterations in mental status is not practical or possible in most institutions.

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Hemicraniectomy for large middle cerebral artery territory infarction: do these patients benefit from this procedure?

Pranesh et al presented a series of 19 patients undergoing decompressive hemicraniectomy for large middle cerebral artery infarction with clinical and radiological signs of transient herniation. Among these, 10 patients (53%) suffered from a dominant hemisphere stroke. Neurological state was assessed according to the National Institutes of Health Stroke Scale (NIHSS) initially and one week after surgery, and functional outcome at three months’ follow up using the Barthel index (BI) and Rankin scale (RS). The mean NIHSS score improved from 20.5 before surgery to 10.5 postoperatively. At last follow up mean BI was significantly better in younger patients (60.7) than in older patients (41.3). The authors conclude that hemicraniectomy may be a useful procedure on patients with large middle cerebral artery infarction.

Recently we undertook a prospective non-randomised study in 26 patients with decompressive hemicraniectomy for right sided middle cerebral artery infarction, analysing functional outcome (NIHSS, BI, RS) at one year of follow up. In contrast to all previous reports, neuropsychological testing was also done, focusing on right hemisphere function (evaluation of visuospatial and visuocognitive abilities, attention, spatial span, and self rated mood). In 18 surviving patients at the one year follow up the functional outcome was good or fair in nine (BI >75, RS 2–3), moderate in six (BI 30–70, RS 4), and poor in three (BI 0–29, RS 5). Thus only nine of 26 patients (35%) were functionally independent and needed no or only minimal assistance for daily life activities. As was shown previously, age was identified as a significant and independent predictive factor on outcome, with better functional results in younger patients. Neuropsychological testing was possible in 14 patients, while four were too disabled to be evaluated. All patients showed profound attention deficits, and visuospatial and visuocognitive deficits was observed in those with less formal education. These disturbances led to a substantial handicap for professional activities.

On the basis of our functional and partly neuropsychological results in patients with isolated non-dominant middle cerebral artery infarction, we would strongly discourage hemicraniectomy in patients with left sided, dominant hemisphere or multiterritory infarction, as the mortality and morbidity is significantly higher. This increases the risk of dependency, hopelessness, and more severe neuropsychological deficits in such cases. In our opinion decompressive hemicraniectomy should be restricted to younger patients with non-dominant hemisphere infarction. The goal of the procedure is to operate on these patients in an early stage of the disease, before additional infarction had occurred as a result of local mass effect and herniation. Up to now we have operated on 39 patients with middle cerebral artery infarction in our institution, but our experiences do not encourage us to act with great enthusiasm.

Pranesh et al stated correctly that this surgical procedure can be undertaken safely, however, the main difficulty is in deciding not to operate on such patients, despite the simplicity of the surgical procedure.

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References


Authors’ reply

The points raised by Sandalcioglu et al are well taken. It was considered justified to undertake decompression even on the dominant side because, if such patients were left with a severe disability, the excellent family support system in India would be available. We do agree that the quality of life is poor after such a decompression. However, the recovery of speech function in our patients has been remarkable, apart from saving their lives which was the patients’ relatives’ wish.

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Psychiatric genetics and genomics


At all turns we can less and less speak of medicine without qualifying it with the term molecular. Our genetic underpinnings and their consequences have assumed their rightful place as extremely important factors in the pathophysiology of most disease—in fact it sometimes seems nearly all disease (arguably) the current bible of molecular medicine. Barton Childs argues, to my mind convincingly, that the future general textbook of medicine will move even further away from the analysis of disease processes towards Garrod. Disease becomes incongruent between variable homeostatic mechanisms and the internal and external environments. At the centre is biochemical individuality and its molecular counterpart mutation. Proteins (and the genes that drive their production) are ubiquitous parts of our homeostatic mechanisms at all levels, the molecular and subsequent biochemical variation determines how we interact with environmental experiences, including social, and how these feedback on the system.

That psychiatric illness is not exempt from such genetic considerations has been clear for some time. What this new volume edited by and Peter McGuffin and his colleagues shows, however, is how widely permeating this has become. There are chapters here that range from personality and cognition (an excellent one from Plomin, Happe, and Caspi) through to personality disorders, anxiety, and eating disorders, through to the more mainline genetics of schizophrenia and affective psychoses. In general they are well written and surprisingly up to date. As a source book of references alone this is worth having and those to very recent publications including 2002 are numerous. The traditional tripos of family, twin, and adoption studies is covered for most disorders before moving into linkage, association, and, where relevant, other molecular analyses such as cytogenetics. The chapter on dementia naturally moves further into the field of molecular pathology and biology, and covers the transmissible encephalopathies and CJD. Contentious areas are not omitted and the chapter on ethical issues is thoughtful and acute (or complete omission) that was the hallmark of some previous works.

BOOK REVIEWS

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Are there any drawbacks? There are always some to be found and as usual these may simply reflect bias on the part of the reviewer. Mental retardation is exceptionally short given its huge clinical importance (mental retardation and epilepsy together are the most common of all neurological conditions) and the recent explosion of interest in the genetic (and epigenetic) phenomena involved. However, this is a relatively small quibble; it is a well produced and worthwhile volume. On the reviewer’s copy the edges of many chapters are already very well thumbed and grubby, which is as good a recommendation as any.

W J Muir


Psychiatric and cognitive disorders in Parkinson’s disease


This comprehensive account of the common (but frequently overlooked and under treated) emotional and cognitive aspects of Parkinson’s disease is thoughtfully organised and well written. The two authors have presented their material in a consistent manner, free from the difficulties (for example, redundancy) often associated with multi-authored texts. Tables and illustrative clinical vignettes are helpful. References are up to date and thorough. In general, the book is well edited (although the two figures demonstrating the cortico-subcortical connections need revision). The text itself is less than 200 pages and is relatively easy to read in its entirety, but each chapter can stand alone. The first few pages briefly highlight the content of and rationale for each of the chapters. The next 50 pages provide a useful background for the non-movement disorder specialist. Chapter two reviews motor features and their treatment. Interestingly, the discussion on surgical approaches is as long as the discussion of pharmacotherapy. This probably reflects the fact that deep brain stimulation is becoming more widely available.

Chapter six includes a discussion of anxiety, apathy, and the debatable concept of a distinct premorbid personality type. Chapter seven mainly focuses on dopaminergic drug induced psychosis. Chapter eight deals with the treatment of depression and psychosis. The appendix consists of several Parkinson’s disease specific scales but does not include other scales commonly used to evaluate depression and anxiety in Parkinson’s disease.

One would not necessarily want to use this book as a reference for specific treatment guidelines and/or dosing of medications. Dosages are not always discussed (for example, for quetiapine) and a few statements are subject to disagreement. In their discussion about unpredictable levodopa responses, the authors appropriately suggest switching from controlled release levodopa to more frequent doses of an immediate release formulation but state that one should keep the same total daily levodopa dosage. Because controlled release tends to have lower bioavailability, many neurologists would reduce the total dose of levodopa when switching to immediate release preparations. The figure demonstrating the treatment of psychosis in Parkinson’s disease suggests that one should check blood and urine for infection or metabolic problems, then check a CT scan before proceeding. Except in unusual circumstances, most Parkinson’s disease specialists would not embark on such an extensive diagnostic investigation. The suggestion that severe psychosis warrants mandatory admission and that one should consider stopping all anti-Parkinson’s disease medication does not reflect typical practice and could, in fact, be dangerous because of the risk of an NMS like syndrome.

In summary, this well written book will enable readers to handle any up to date and well rounded knowledge base regarding the cognitive and psychiatric aspects of Parkinson’s disease and would be quite helpful to all clinicians (including neuropsychologists and non-neurologists) who deal with Parkinson’s disease patients.

I Hegeman Richard

Surgical treatment of Parkinson’s disease and other movement disorders


Cognitive neurology is on the up. In Britain, at least, the numbers of trainee neurologists who aim to make this their focus of interest are increasing—mainly because of the attraction of the bright, kaleidoscopic lights of functional imaging! No, some neurologists in the making appreciate that perhaps there is a great deal still to be said for the careful assessment of patients with both focal and diffuse brain lesions. Not only does this offer an important insight into normal brain function, but it is critical for the development of therapies for cognitive impairments. So, is this handbook a helpful contribution to the renewed interest in cognitive function? It certainly does have several features to recommend it. It is compact, to the point, and gives references to important papers in the literature. It covers a vast amount of neurology and neuropsychiatry in a breathtaking short format. However, although brevity is often to be admired, there is a danger that some of the points made in this book may be appreciated only by those who already know what you are talking about. This surely should not be the aim of a handbook that is aimed at trainees. Moreover, attempts to make things concise can sometimes be important omissions. In this text, for example, there is a small section on simultanagi-
Neural stem cells for brain and spinal cord repair of what are currently incurable degenerative diseases and trauma to the brain and spinal cord. The 16 contributions contained in the book cover various topics including brain, neurospheres, neural crest, and already established human stem cell lines such as human embryonic stem cells and induced pluripotent stem cells. Several chapters summarise the current methods for obtaining neural stem cells, including brain, neurospheres, neural crest, bone marrow, and already established human stem cell lines such as human neuroteratocarcinoma cells. The stated aim of this book is to provide a practical and accessible guide to the diagnosis, assessment, and treatment of obsessive compulsive disorder (OCD). The 14 chapters include contributions from an international panel of expert clinicians and a final chapter, the patient’s perspective, from a psychologist who also has OCD. The second section covers basic research in affective disorders, with contributions on genetics, functional imaging, and autonomic control in psychiatric disorders. The first four chapters present an overview of the nosology, epidemiology, psychopathology, and assessment of OCD. The chapter on quality of life is followed by three chapters that summarise the neurobiology of OCD in terms of genetic factors, neuroanatomy, and neurochemistry. The final section of the book provides chapters on pharmacological and psychological treatments for OCD, including treatment resistant cases and children and adolescents. The strength of this book lies in the detail of the discussion of the subtleties of clinical assessment, pharmacotherapy, and psychotherapy. There are a number of clinical pearls contained in these chapters, which will help clinicians to ensure that their patients receive the most effective and appropriate treatments available. The chapter on integrated treatment highlights the gap in evidence whereby it is still uncertain whether combining drug treatment with exposure therapy is any more effective than drug treatment given alone. Although busy general adult psychiatrists are unlikely to ever use the Yale-Brown Obsessive Compulsive Scale, included as an appendix, its inclusion helps to highlight the need for systematic assessment of target symptoms over the prolonged timescale of response to treatment. As a stand alone text this has many merits and can be recommended to anyone who is involved in the assessment and treatment of OCD. For those more interested in the neurobiology it provides a stimulating introduction with good references to the more detailed literature.