Exciting circuits

*Deep brain stimulation for depression*

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Chapter 3

Inaccurate psychiatric diagnosis leads to unnecessary functional neurosurgery

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Submitted

3.1 Introduction

Optimal diagnosis is pivotal for adequate treatment. The diagnostic process is complicated when similar symptom profiles arise from different causes needing different therapeutic strategies. For instance, depressive symptoms can arise from unipolar, bipolar depression or secondary to trauma, which are associated with different preferred treatments. The following case shows how an inaccurate diagnosis of major depression in a 46-year old woman resulted in decades of suboptimal treatment and eventually in unnecessary neurosurgery.

3.2 Case report

Mrs A had been diagnosed with recurrent depression since she was 15. Over 30 years, she had been treated according to the Dutch protocol for depression (consisting of psychotherapy, pharmacotherapy and electroconvulsive therapy) without lasting, adequate antidepressant response. Consequently, she was screened and indicated for deep brain stimulation (DBS) of the ventral anterior limb of the internal capsule (vALIC) in ETZ location Elisabeth, Tilburg, The Netherlands. DBS is a promising treatment for depression, which modulates activity of specific brain areas by electric pulses delivered through implanted electrodes. The extent of modulation can be adapted by changing stimulation parameters such as voltage, frequency and pulse width of the electric pulses.

During 13 months a psychiatrist tested stimulation parameters without any antidepressant effect, except for short-lived manic symptoms lasting a few hours after switching stimulation on for the first time. Some symptoms even worsened, most notably restlessness and anxiety, reflected in a Hamilton Depression Rating Scale (HAM-D) score increase from 22 before DBS surgery to
30 after 13 months (corresponding with severe depressive symptoms). Disappointment over DBS failing to relieve symptoms even led Mrs A to attempt suicide after nine months of treatment.

She was referred to the Academic Medical Center, Amsterdam, for a second opinion regarding possible unexplored stimulation parameters. We observed a desperate woman with frequent suicidal ideations. She expressed feelings of shame, guilt and worthlessness. She looked exhausted, because she had been sleeping no more than three hours a night for months on end. In her daily life, she was quickly agitated and had emotional outbursts. Despite her disappointment, Mrs A agreed to try new DBS parameters.

During four months stimulation parameters were tested without any improvement. After these four months, Mrs A told us she contemplated undergoing Eye Movement Desensitization and Reprocessing (EMDR). When we asked her for what indication, she disclosed to us previously unknown severe and complex trauma: during her childhood she was sexually abused for five consecutive years and was abused again during her adolescence. She had undergone unsuccessful sessions of EMDR previously, but this targeted the abuse in her adolescence only. Out of shame and the idea she somehow was to blame for the abuse in her childhood herself, she never told anyone about this, not even her closest family members. For years, she had suppressed intrusive memories about the traumas. The memories at the time had become more frequent, more vivid and harder to suppress, because newspapers and television had started reporting on sexual abuse in the catholic church. It was only then she felt confident enough to discuss this with her psychologist.

A psychiatrist confirmed a severe posttraumatic stress disorder (PTSD) with a Clinician-Administered PTSD Scale (CAPS) score of 99. We decided to change treatment to intensive psychotherapy after deactivation of DBS, although Mrs A was anxious about this idea. Ten days after deactivation of DBS and before the start of therapy, Mrs. A reported a drop in suicidal ideations, restlessness and anxiety. Subsequently, an experienced psychologist started an intensive 2-week inpatient trauma therapy consisting of daily sessions of exposure therapy combined with imagery re-scripting. Following treatment, PTSD symptoms went into remission (CAPS: 11), accompanied by a decrease of depressive symptoms (HAM-D: 12, mild symptoms). After challenging cognitive schemas with schema therapy, the depressive symptoms disappeared and the patient was discharged with a HAM-D score of 2. Mrs A retained this improved level of functioning and eventually was able to return to work.
3.3 Discussion

The case of Mrs A teaches us several lessons. First, vALIC DBS might lead to an increase of hyperarousal in PTSD patients, given anxiety and restlessness increased following initiation and decreased after deactivation of DBS. Although one case obviously cannot provide conclusive evidence, this suggests we should be cautionary when applying vALIC DBS in patients with (co-morbid) PTSD. Second, it confirms the pivotal role of accurate diagnosis in effective treatment selection. Decades of ineffective treatments and unnecessary neurosurgery could have been prevented. Third, clinicians should be aware even long-standing diagnoses in seemingly treatment-resistant patients can be wrong. For 30 years, several psychiatrists assigned the depressive symptoms of Mrs A to major depression, whereas they originated from defect cognitive schemas set about by a complex trauma. This stresses the continued need of broad clinical thinking and intensive screening for alternative causes underlying psychiatric symptoms, especially in chronic cases.