Acta Psychiatr Scand 2003: 107: 241–243
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ACTA PSYCHIATRICA
SCANDINAVICA
ISSN 0001-690X

Editorial

Psychosurgery for obsessive–compulsive disorder – concerns remain

Obsessive–compulsive disorder (OCD) sometimes progresses to states that belong to the most crippling in psychiatry. Unlike schizophrenia, OCD does not result in cognitive or intellectual loss, yet its outcome may become worse. Anyone who has witnessed a person tormented by violent obsessions dictating constant rituals in order to prevent disasters or someone in desperate search of the 'just right feeling' will agree that those persons are even more enslaved by their obsessions than heroin addicts are by their cravings. But, unlike heroin, rituals do not bring on pleasure; rather they allow a brief relief until the next obsession claims action.

The OCD is a neuropsychiatric disorder. Previous investigations have repeatedly demonstrated brain deviations involving the orbitofrontal cortex, cingulate gyrus, parietal lobe, caudate nucleus and thalamus. According to new findings by Kang et al. published in this journal, parieto-cerebellar involvement in cognitive disturbances should also be added to this list (1).

The crippling nature of the disorder may seem to justify any treatment, from lobotomy in its time, to subcaudate tractotomy, limbic leucotomy, cingulotomy, capsulotomy, and deep brain stimulation (DBS) in our time. It has been argued that these treatments are currently under-used considering the pool of potential patients. An early study of neurosurgery for OCD reports a response rate of 71% (2), but more recently this has dropped to 32–40% (3, 4). Various methods are used: subcaudate tractotomy interrupts the frontothalamic fibres at different sites, previously by means of radioactive Yttrium rods, but nowadays through thermocoagulation. Anterior cingulotomy targets the cingulum bundle on each side, using thermocoagulation, limbic leucotomy is a multitarget procedure adding lesions on the frontothalamic projections to those of anterior cingulotomy, and capsulotomy targets the anterior limb of the internal capsule by means of radiofrequency thermolesion or gamma lesion. DBS for the treatment of OCD targets the same regions as capsulotomy but does not aim at producing a lesion; instead, tiny buried electrodes stimulate regions of the brain. In the event of complications these are assumed to be reversible which offers a potential advantage over ablative therapy.

In this journal two interesting studies using different surgical methods for treatment of OCD are presented. Gabriëls et al. present the first detailed account on three consecutive cases of DBS treatment of OCD (5). Two of the patients experienced substantial improvement of OCD symptoms. One of the patients became overweight after DBS, but no harmful side-effects were detected at 1-year follow-up. Kim et al. report in detail on 14 patients treated with cingulotomy (6). Six (43%) met the response criteria at 12-month follow-up. No significant cognitive dysfunction was detected on extensive neuropsychological tests. These patients had little psychiatric comorbidity, which is unusual in severe OCD and may explain the favourable results.

Although several concerns regarding neurosurgery for OCD may seem dissolved, some still remain to be considered.

Who has an intractable OCD?

A person with severe functional impairment caused by an incapacitating OCD, despite appropriate behavioural treatments, at least 10 weeks at maximally tolerated dose of clomipramine, fluoxetine, fluvoxamine, sertraline, paroxetine and a monoamine oxidase inhibitor as well as augmentation strategies of at least one of the above drugs for 1 month with at least two of the following drugs: lithium, clonazepam and buspiron, and in the case of concomitant tics augmentation with a low-dose neuroleptic, was defined as suffering from 'malignant OCD' in 1998 (7) (nowadays neuroleptic augmentation is recommended for any treatment refractory case). Supposedly this implicates that all treatment options are exhausted and surgery is the last hope for relief. However, this might not be the case, as several other treatment strategies have

This issue of *Acta Psychiatrica Scandinavica* also indudes a short biography of S. Bejerot.

been successful, e.g. anti-androgen treatment, augmentation with antiepileptics, olanzapine, nicotine, tryptophan and pindolol, treatment with opioids, amphetamine, combinations of different tricyclics and serotonin reuptake inhibitors, high dosages of citalopram and intravenous treatment with clomipramine. Yesterday's intractable OCD patient may well be treatable today and intractability may depend on the ambition of the prescriber.

What are the effects? What are the side-effects?

Without any modern treatment patients with severe OCD have nevertheless recovered according to a study by Tan et al. (8): 24 patients treated with bimedial leucotomy, were matched with a non-treated group of 13 patients with an illness of similar severity. Twenty-three per cent of these were rated as much improved when followed for 5 years, according to a blinded assessor, compared with 50% of those who had undergone leucotomy. The authors also report on frontal lobe dysfunction secondary to surgery: 'The social consequences of disinhibition were greater in the leucotomy group. Two patients frequently embarrassed their husbands by being slovenly, overdemonstrative or swearing in public. Two other became irresponsible over money… The wife of another complained of excessive sexual demands from her husband 1 year after operation. Three years later he was cautioned by the police for making improper advances to young girls'. On the other hand, the results from more recent long-term follow-up studies suggest a development into a more normalized personality after capsulotomy (9). However, the accuracy of these results can be questioned as the results are entirely based on self-rating questionnaires on personality traits. If a person has dysfunctional frontal lobes, can he/she reliably assess his/her own personality deficits considering that the very capacity to do so resides in the frontal lobes?

Can neurosurgery for OCD be a ticking bomb?

Follow-up studies on patients that have undergone neurosurgery for OCD decades ago are of special interest. They can tell us what happens in the long run. In a study by Irle and co-workers (10) 16 of 37 subjects who had undergone ventromedial frontal lesions in the 1970s agreed to a comprehensive follow-up in 1992. In a subset of 11 subjects with additional lesions of the ventral striatum, eight developed substance dependence 3–9 years post-operatively. All 16 patients had subnormal performance on Wisconsin Card Sorting test, a commonly used measure of the frontal lobe function. In another long-term follow up of patients who had been capsulotomized for anxiety disorder other than OCD, nearly one-third (five of 17) presented clear hypo-frontal personality traits approximately a decade after surgery (11). There is a deterioration of frontal executive functioning with age in healthy adults, therefore it seems reasonable that advancing age can make individuals more vulnerable to cognitive decline postoperatively (12), however, this decline may become obvious only many years after surgery.

Would the patients choose surgery if they fully understood the risk of side-effects?

Although the target symptoms as compulsions and anxiety are successfully reduced after neurosurgery for OCD, other unwanted symptoms may appear instead: weight gain is frequently reported, and in some cases, severe alcoholism (10), memory problems (10), attentional slowing (10), lower performance IQ (10), loss of initiative/psychasthenia (10, 13, 14), diminution of inhibition (13–15), elevated mood occasionally with an overshoot towards carelessness (13, 14), emotional shallowness (13), aggressive tendencies (13, 14), poor impulse control (13) and sexual assaults (8). Additionally, suicide, which is conspicuously rare in OCD (16), has been reported after surgery (4, 17, 18). However, most side-effects are typically reported as either uncommon or mild (17). On the other hand the reported side-effects may only represent the tip of an iceberg because of: (i) a decline in executive functions after surgery which hinders the patients to turn up for follow-up sessions, (ii) late-onset side-effects that become prominent only when follow-up programmes are terminated, (iii) the interpretation of, e.g. weight gain as a result of the patient's greater ability to relax and enjoy life when relived of anxiety and compulsive restlessness (2), (iv) inability to express side-effects caused by frontal dysfunction, or (v) the general bias against publishing negative results.

Examples of hypo-frontal side-effects after capsulotomy known to me are one man who raped his wife in front of the children but was defined as responder as his OCD symptoms had abated, and another 'successful case' who stole a bus many years after surgery.

Are the effects of DBS fully reversible?

The physiological mechanisms underlying the beneficial effect of DBS are not well understood and may be extremely complex. Our knowledge of DBS comes from experience with Parkinson's

disease. With electrodes implanted in the subthalamic nucleus (STN) the Parkinsonian tremor and the doses of levodopa can be readily reduced, however declines have been noted in working memory, speed of mental processing, coordination, phonemic fluency, long time consolidation of verbal material and encoding of visuospatial material (12). Also 'frontal' behavioural dyscontrol without the benefit of insight was frequently identified in the subgroup of elderly patients. It cannot be ruled out that individual younger patients may also be at risk for cognitive and behavioural changes (12). The authors conclude that changes in neuropsychological functioning could be attributed to following factors: 'surgical trauma caused by microelectrode passes, macroelectrode implantation, chronic stimulation of the STN and/or current spread to adjacent structures, microlesion effects, significant decline in L-dopa equivalent dosages, and advanced age'. Whether the neuropsychological decline after DBS in Parkinson's disease is reversible or not, is not known.

There is no doubt that neurosurgery can dramatically reduce obsessions and compulsions; the question is, to what prize. Experts on ethics encourage neurosurgery for OCD but lack sufficient information to fully interpret the results. The implicit claim that improvement comes at nearly no costs requires considerably more evidence in order to be reliable. Only thoroughly performed studies that include comprehensive interviews with close relatives, independent assessors and mandatory yearly follow-ups of all patients for at least a decade after surgery and again at old age, will provide sufficient assurance. Neurosurgery for mental disorders should only be allowed in research settings in order to determine whether the clinical benefits outweigh the adverse effects.

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Invited Guest Editor

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