



Personality disorders improved after arachnoid cyst neurosurgery, then rediagnosed as ‘minor’ organic personality disorders

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ABSTRACT

The prevalence of arachnoid cysts (AC) is considerably increased in psychiatric patients, suggesting a possible causal relationship between AC and certain psychiatric disorders. Neurosurgery of AC in psychiatric disorders is, however, not recommended if no accompanying neurological symptoms or signs of increased intracranial pressure are present. In two cases of slow onset personality disorder in persons suffering from so-called asymptomatic AC, we performed AC neurosurgery beyond established rules. Both comparisons before and after neurosurgery of psychopathology and the following long-term course support in retrospect that both cases might be re-diagnosed as having suffered from ‘minor’ organic personality disorders before AC neurosurgery, which improved thereafter. The two cases did not initially appear to fulfill the established criteria for organic personality disorders either according to ICD-10 or DSM-IV, but in retrospect satisfied most criteria. In themselves, the personality disorders appeared not very severe, but had considerable relevance for the patients’ lives. The established rules for AC neurosurgery should be reconsidered at least when therapy-resistant psychiatric disorders are observed in AC sufferers.

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1. Introduction

Arachnoid cysts (AC) are a relatively frequent neuroradiological finding (~3/1000) and usually considered nonpathogenic, but AC prevalence was found to be doubled in psychiatric as compared with non-psychiatric patients (Becker et al., 1991a). Follow-up cranial computed tomography (cCT) data in psychiatric patients suffering from AC showed that in about 50% of cases the AC volumes changed over time, with AC becoming or larger (Becker et al., 1991b). Furthermore, it is known that AC sufferers may at some time point or another develop neurological symptoms matching the AC topology, and then being categorized as symptomatic AC. However, in AC with parallel exclusively psychiatric syndromes (= without neurological symptoms), the diagnostic evaluation of a possible causality of AC for the psychopathology is very difficult. Few single cases presenting with severe psychiatric syndromes, e.g. dementia or schizophrenia-like disorder, with neurological symptoms underwent AC neurosurgery (ACns) and might have improved or not after ACns, but usually ACns was not performed because no causal relationship to the respective

psychiatric disorder was assumed. (Kuhnley et al., 1981; Clavel et al., 1985; Cullum et al., 1994; Heidrich et al., 1996; Millichap, 1997; Licina et al., 2004). Summing up, psychiatric syndromes in AC sufferers when not paralleled by neurological abnormalities (e.g. paresis and disturbed consciousness) nor by focal electroencephalographic (EEG) abnormalities, are presently considered not to be pathogenic, and AC are therefore viewed as asymptomatic. It remained even questionable whether headaches or seizures, although considered causally related to AC, improve after ACns (Koch et al., 1995), because only in large symptomatic cysts is the degree of cyst volume reduction after ACns (the typical procedure is cyst fenestration or shunting) correlated significantly with clinical improvement (Kandenwein et al., 2004). However, recently it was shown that test performance in a group of persons suffering from AC was overall improved after ACns, supporting the alternative view that seemingly asymptomatic AC may represent a causal factor in some cases of psychiatric disorder, although at the single case level the improved test performance was not directly related to clinical improvement nor to improved radiological findings; overall, ‘it remained uncertain whether these laboratory test results reflected an improvement of true clinical problems’ (Raeder et al., 2005).

Our recent observations in two cases shed further light on these open questions. Both cases were suffering from subtle personality change in adulthood, respectively late adolescence, and both were, after being identified as AC sufferers, primarily not subjected to ACns according to established rules. Nevertheless, with therapy resistance

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we reevaluated aspects of disease course (very slow but new onset of personality disorder during adulthood or adolescence), and pathology (e.g. irritability and anxiety symptoms) regarding a possible causality of the temporo-frontal AC for the personality disorder. However, the fronto-temporal area represents the preferred site of AC generally. So, in both cases, on a rather arbitrary basis, ACns were performed, and indeed personality disorders improved as demonstrated by before-and-after ACns comparison of psychopathology, by overcoming the previous therapy resistance, and by the long-term catamnesis.

2. Patients and methods

Both *case observations* were made when detecting AC by routine diagnostics, without any primary suggestion of an AC or of an organic personality disorder. *Case 1 (C1)* was a friend of K.B. reporting just on a private basis about the results of a differential diagnostic approach to headache, where AC was detected without any indication for ACns. Based on the personal knowledge of the person over years before, K.B. considered a gradual slight personality change, though not fulfilling the criteria of organic personality disorders as established in the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10) or in the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV). *Case 2 (C2)* was a young adult inpatient in our psychosomatics department. He had been treated before as an outpatient in various settings and was now hospitalized for the first time. Two AC were detected by routine cCT and confirmed by magnetic resonance imaging (MRI).

Psychiatric diagnosis was made by clinical consensus (minimum of two experienced psychiatrists at the specialist level) according to ICD-10 (research criteria) and DSM-IV. Both cases were demonstrated and discussed in great detail in large clinical case conferences.

Brain imaging: cCT was performed by Siemens Somatom Plus 4 Power, magnetic resonance (MR) imaging by Siemens Harmony.

Psychological tests: case 2 was tested by the computerized Wiener points (see Fig. 2), a test program which was chosen because it is suitable to detect slight disturbances of performance and because the tests are known to be rather resistant to learning effects (Kramm, 2000; Brunner and Dvorak, 1985; Zimmermann and Leclercq, 2002).

3. Results (clinical case observations)

3.1. Case 1

C1 was never treated as a psychiatric patient. Based on knowing him as a friend over years, it seemed to K. B. that his personality might have changed over a period of some months or of about 1 year. He seemed to be a little bit more irritable, to come up with unstable moods, a bit lowered critical thinking (the latter aspect not subjectively recognized by himself), and with severe complaints such as reduced stress tolerance and reduced working performance. Nevertheless, he continued to work in his job most of the time. Just by small talk, C1 had reported about his history of repeated headaches and respective differential diagnostic approach. Neurologists had detected a frontal AC, but according to the established rules there was no indication for ACns. This conclusion was confirmed by experienced neurosurgeons from two different departments; eventually the AC was considered asymptomatic. After re-discussion of the case in the sense of a subtle or 'minor' organic personality disorder, mainly based on the intimate personal knowledge (K.B.), this evaluation (as asymptomatic AC) was challenged. Nevertheless, the initial conclusion remained to not perform ACns. Only 6 months later, the psychiatric symptoms reinforced a little bit, though never fulfilling diagnostic criteria of an organic personality disorder. MR imaging showed at this time point a large AC on the right temporal lobe (8×9×5 cm), but without any sign of volume gain over time. The subjective complaints of the patient were at this time point also

reinforced: he was feeling "bad", working speed was reduced, stress tolerance further lowered, and subjective power even more reduced. After another re-discussion of a diagnosis of possible 'minor' organic personality disorder, the neurosurgeons considered ACns as a serious option (and despite the fact that 'minor' organic personality disorder does not represent an established diagnostic entity, see below). With fully informed consent the patient chose the ACns option: after craniotomy an open cysto-ventriculostomy was performed without complications. As expected, at post-ACns neither the AC volume nor the shape of brain parenchyma was changed. Nevertheless, within the following weeks both the working performance and the subjective well-being of C1 improved. He fully recovered within several months. Since then, he has remained well. The catamnesis of over 10 years is perfect. More details are not reported here for circumstantial reasons.

3.2. Case 2

A 20-year-old man was admitted to a first psychiatric inpatient treatment after unsuccessful outpatient treatment over 2 years, which had failed to improve the serious behavioral problems including anxieties and depression. He was diagnosed to suffer from emotionally unstable personality disorder (impulsive type ICD-10, F60.30). His high-risk driving had drawn repeated sanctions, and driving license withdrawal was pending. The main subjective complaints were anxieties and feelings of being rejected by the members of his peer group, e. g. in school and in family. He demonstrated frequent aggressive and suicidal thoughts, which had been intensifying over the last 6 months. He presented no neurological symptoms in repeated examinations. During our inpatient treatment of 5 months he underwent a behavioral psychotherapy program combined with complex psychopharmacotherapy (tranquilizers, neuroleptics, and antidepressants), but with little success: neither his aggressive unpredictable behaviors nor his subjective complaints improved greatly; instead, severe panic attacks associated with suicidal thinking remained frequent. Our intended rehabilitation program failed. We had repeatedly discussed whether the therapy-resistant personality disorder might be causally related to two relatively small AC detected by routine cCT (1 AC frontal right, 1 AC temporo-polar left; Fig. 1), or whether these AC were incidental findings. There were several social risk factors (family and school), but these were not in themselves diagnostic regarding axis 4, DSM-IV. A diagnosis of organic personality disorder was not made (see Table 1), because important criteria were not fulfilled, e.g. neither neurological symptoms were present nor was there a short term onset of personality disorder, nor any radiological signs of volume gain nor of increased intracranial pressure. So the established diagnostic rules suggested no causal relationship between the two AC and the psychiatric syndrome. Furthermore, the two AC were just detected by chance during routine cCT. electroencephalographic (EEG) and neurological examinations showed normal status during the inpatient observation period. The performance in a psychological test battery (see Fig. 2) was within the normal range.

In conclusion in C2 the AC were considered asymptomatic and ACns therefore was not indicated according to established rules. However, after the failure of our 5-month inpatient treatment program, the causality question was reconsidered and a possible causal relationship between the AC and a 'minor' organic personality disorder was re-discussed. With respect to our experiences in C1, a relative indication of ACns was agreed and discussed with the patient including the balance between uncertain ACns indication and possible risks of ACns. The frontal AC was considered to have low neurosurgery risks in contrast to the temporal AC. After written informed consent was obtained, ACns was performed: The frontal AC (1.5×2.5×5) was fenestrated as usual, without any complications. Yet during ACns the previous AC space was refilled by the surrounding brain parenchyma (compare pre-post-surgery cCT, Fig. 1). This detail meant, but only in

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