

MAIN THEME: COGNITIVE PSYCHIATRY, PERSONALITY CHANGES

ON A POSSIBLE CAUSAL RELATIONSHIP BETWEEN ARACHNOID CYSTS AND PERSONALITY DISORDERS

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Present view on the causal relationship between arachnoid cysts and neuropsychiatric syndromes

Prevalence of arachnoid cysts (AC) is high in psychiatric patients (about doubled compared to normal controls), suggesting a possible causal relationship between AC and certain psychiatric disorders. Neurosurgery of AC is recommended when focal neurological symptoms or signs of increased intracranial pressure are present.

The question whether arachnoid cysts, most prevalent in frontotemporal area and fossa posterior, should be treated by neurosurgery is often difficult to answer. For example, it remained questionable, whether symptoms of headaches or epileptic seizures really improve, though in some patients did. There is no question, that in so-called symptomatic arachnoid cysts (that is in cases showing focal neurological symptoms or signs of increased intracranial pressure) AC should be treated and are usually successfully treated [1]: 2/3 of such cases were symptomfree after neurosurgery, the overall improvement correlated with cyst volume reduction. In cases of childhood psychiatric disorders, all cases with attention deficit hyperactivity disorder (ADHD) associated with temporal ACs, no surgical treatment was recommended [2]. On the other hand [3], when treating a number of patients (n=55, age 16 – 70 years) presenting supratentorial cysts (temporal

43, frontal 11, parietal 1), a considerable number of patients reported relief from symptoms (29), or reduced complaints (20), few were unchanged (3), but few worsened (3). Again, more volume reduction correlated with better improvement. The symptoms before neurosurgery were headache (48), dizziness-nausea (9) and epilepsy (8). In parallel, cognition was tested before and after neurosurgery by various tests: overall, the group of persons treated by neurosurgery improved whereas not the control group (speed higher, less errors) and improvement correlated with more cyst volume reduction.

Regarding treatment of arachnoid cysts in patients with pure psychiatric syndromes the question is however unclear, and present treatment recommendations do not include neurosurgery of such psychiatric syndromes [1]. Nevertheless it was shown, that psychiatric patients with severe psychiatric disorders may indeed improve with AC neurosurgery: Clavell et al [4] reported 2 cases (67 years old male and 69 years old female) in whom dementia was associated with frontal or posterior fossa AC. After AC neurosurgery both cases improved. Heidrich et al [5] reported a 52 year old female, suffering from instable mood and pseudologia fantastica and having acted as a firesetter, however neurosurgery of posterior fossa AC showed a questionable result. Russo et al [6] reported a case of a 43 year old male with occipital headache and nausea associated with AC in the posterior fossa, which improved spontaneously, improvement correlating with

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volume reduction of the AC after 2 months - Kuhnley et al [7] reported a pure psychiatric presentation in a 23 year old male who developed over 18 months a progressive loss of mental functions ending up in a schizophreniform disorder, which completely remitted after neurosurgery of a left temporal AC. Licina et al [8] reported a chronic remitting-relapsing case of depression and stupor, at the timepoint of report suffering over nearly 20 years at age 45 years, the phases of stupor being associated with variant cyst sizes of a left frontotemporal AC. This case was not proposed to neurosurgery instead treated by psychopharmaca with limited success.

Pure psychiatric syndromes in AC sufferers

The question of a possible causal relationship between ACs in psychiatric syndromes appears to be more difficult to answer in cases with pure psychiatric syndromes not presenting focal neurological sign, epilepsy or severe headache. It has been found, that in a large sample (n=13 297) of patients investigated by brain imaging in a large university hospital (Würzburg) the prevalence of arachnoid cysts was 3,2 % (n=43) [10]: the share of psychiatric patients in the whole sample was 8%, but in the AC sufferers 19%. So the prevalence of arachnoid cysts in psychiatric patients was considerably increased. When looking at the cyst size and age it was shown that apparently the cyst size in a subgroup was increasing with age [11].

Own recent studies

Chance observations of psychiatric cases suffering from AC detected by routine brain imaging (CCT or MRI) initiated by the clinical in-depth evaluation of the single cases: specific course characteristics or comorbid symptoms, suggested a possible causal relationship between AC and the psychiatric disorder in some individual cases. But to differentiate non-pathogenic vs. possible pathogenic ACs was difficult. Assessment of brain imaging and psychological testing was repeated before and after AC neurosurgery. In two cases of slow onset personality disorder, both persons suffering from so-called asymptomatic AC according to the present recommendations, we eventually performed AC neurosurgery beyond established rules [9]. Pre-post neurosurgery comparison and long-term course suggested that in both cases the ACs were

pathogenic regarding psychiatric symptoms. So, our cases were re-diagnosed as having suffered from 'minor' organic personality disorders before AC neurosurgery.

Outlook

In a preliminary evaluation of individual AC sufferers, it appears usually difficult to decide whether or not neurosurgery of an AC should be recommended in patients with pure psychiatric syndromes (without neurological symptoms). Nevertheless, some pure psychiatric syndromes apparently can be caused by arachnoid cysts. Criteria to recommend or not neurosurgery in the single case remain however open. On the other hand, when refusing neurosurgery as a treatment option, one may miss a chance for considerable and rapid improvement if not full remission of severe psychiatric syndromes. More studies including long term observations and careful psychological testing before and after neurosurgery are required. The established rules for AC neurosurgery should be reconsidered in therapy resistant psychiatric disorders observed in AC sufferers, though a non-causal association of ACs with personality disorder can hardly be excluded before neurosurgery. The risks of AC-neurosurgery in the individual case have to be balanced to expected benefits, a difficult undertaking.

References

1. KANDENWEIN, J.A., H.P. RICHTER, and W. BORM, Surgical therapy of symptomatic arachnoid cysts - an outcome analysis. *Acta Neurochir (Wien)*, 2004. 146(12): p. 1317-22; discussion 1322.
2. MILLICHAP, J.G., Temporal lobe arachnoid cyst-attention deficit disorder syndrome: role of the electroencephalogram in diagnosis. *Neurology*, 1997. 48(5): p. 1435-9.
3. RAEDER, M.B., C.A. HELLAND, K. HUGDAHL, and K. WESTER, Arachnoid cysts cause cognitive deficits that improve after surgery. *Neurology*, 2005. 64(1): p. 160-2.
4. CLAVEL, M., F.G. TABORGA, and I. ONZAIN, Arachnoid cysts as a cause of dementia in the elderly. *Acta Neurochir (Wien)*, 1985. 78(1-2): p. 28-32.
5. HEIDRICH, A., A. SCHMIDTKE, K.P. LESCH, E. HOFMANN, and T. BECKER, Cerebellar arachnoid cyst in a firesetter: the weight of organic lesions in arson. *J Psychiatry Neurosci*, 1996. 21(3): p. 202-6.
6. RUSSO, N., M. DOMENICUCCI, M.R. BECCAGLIA, and A. SANTORO, Spontaneous reduction of intracranial arachnoid cysts: a complete review. *Br J Neurosurg*, 2008. 22(5): p. 626-9.

7. KUHNEY, E.J., D.H. WHITE, and A.L. GRANOFF, Psychiatric presentation of an arachnoid cyst. *J Clin Psychiatry*, 1981. 42(4): p. 167-8.
8. LICINA, M., S. VITOROVIC, and I. VELIKONJA, Frontotemporal arachnoid cyst connected to relapsing stupor. *J Neuropsychiatry Clin Neurosci*, 2004. 16(1): p. 120.
9. BECHTER, K., R. WITTEK, K. SEITZ, and G. ANTONIADIS, Personality disorders improved after arachnoid cyst neurosurgery, then rediagnosed as 'minor' organic personality disorders. *Psychiatry Res*, 2010. 184(3): p. 196-200.
10. BECKER, T., M. LANCIK, E. HOFMANN, T. MÜLLER, M. WARMUTH-METZ, J. FRITZE, and B. SCHUKNECHT, Erhöhte Prävalenz von Arachnoidalzysten bei psychiatrischen Patienten: Eine retrospektive CT- und MR-Untersuchung. *Klin Neuroradiol*, 1991(1): p. 154-160.
11. BECKER, T., M. WAGNER, E. HOFMANN, M. WARMUTH-METZ, and M. NADJMI, Do arachnoid cysts grow? A retrospective CT volumetric study. *Neuroradiology*, 1991. 33(4): p. 341-5.