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SURGICAL TREATMENT OF ARACHNOID CYSTS IN A PATIENT WITH PSYCHOSIS – A CASE REPORT AND LITERATURE REVIEW

LECZENIE OPERACYJNE TORBIELI PAJĘCZYNÓWKI U CHOREGO Z ZESPOŁEM PSYCHOTYCZNYM - OPIS PRZYPADKU I PRZEGLĄD LITERATURY

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Summary

Arachnoid cysts are relatively rare intracranial disorders. They frequently give no symptoms and do not require neurosurgical treatment [7, 8]. For some particularly large cysts, neurological symptoms may occur, which may indicate the need for surgical intervention. This paper describes the case of a 32-year-old man with an extensive arachnoid cyst of the middle cranial fossa, suffering from paranoid schizophrenia with positive symptoms. The patient underwent surgical treatment. By way of peritoneal craniotomy, the walls of the cyst were removed along with its connection to the cisterns of the subarachnoid space and of the lateral chamber. A follow-up CT scan performed on the fourth day after the procedure showed a minimal reduction in the size of the cyst. The patient after the surgery presented no positive symptoms; however dyskinesia occurred in the form of a hypokinetic – hypertonic syndrome, a slight and transient paresis of the left upper limb, and a depressed mood and decreased drive presenting as an apathic–abulic syndrome. In the course of further psychiatric treatment and rehabilitation, these symptoms gradually subsided. During the publication of this work, the patient is undergoing continued psychiatric treatment. Until the publication of this work, no further psychotic symptoms have been observed.

Streszczenie

Torbiele pajęczynówki są względnie rzadkimi schorzeniami wewnątrzczaszkowymi. Najczęściej przebiegają one bezobjawowo i nie wymagają leczenia neurochirurgicznego [7, 8]. W przypadku niektórych, zwłaszcza rozległych torbieli występować mogą objawy neurologiczne, co oznaczać może konieczność interwencji operacyjnej. W niniejszej pracy opisano przypadek 32-letniego mężczyzny z rozległą torbielą pajęczynówki środkowego dołu czaszki cierpiącego na schizofrenię paranoidalną z objawami wytwórczymi. Chorego poddano leczeniu operacyjnemu. Drogą kraniotomii pterionalnej wykonano usunięcie ścian torbieli i jej połączenie ze zbiornikami przestrzeni podpajęczynówkowej oraz z komorą boczną. W wykonanym badaniu kontrolnym tomografii komputerowej w 4. dobie po operacji wykazano minimalne zmniejszenie się rozmiarów torbieli. U chorego po zabiegu nie wystąpiły jakiekolwiek objawy wytwórcze, wystąpiły natomiast dyskinezy w postaci zespołu hipokinetyczno-hipertonicznego, przejściowy niewielki niedowład w zakresie lewej kończyny górnej oraz obniżenie nastroju i napędu w postaci zespołu apatyczno-abulicznego. W wyniku dalszego leczenia psychiatrycznego i rehabilitacji objawy te stopniowo ustępowały. W trakcie publikacji niniejszej pracy chory poddawany jest w dalszym ciągu leczeniu psychiatrycznemu. Do chwili publikacji niniejszej pracy nie wystąpiły u chorego objawy wytwórcze.

Key words: arachnoid cyst, paranoid schizofrenia, psychosis
Słowa kluczowe: torbiel pajęczynówki, schizofrenia paranoidalna, zespół psychotyczny

INTRODUCTION

Arachnoid cysts are rare intracranial disorders, occurrence of which is determined at approximately five cases per 1000 people globally [7]. They represent about one percent of all intracranial lesions. They are four times more common in men and are usually congenital. They arise due to abnormalities in cell division in the arachnoid mater [7, 8, 12]. Arachnoid cysts are fluid reservoirs with biochemical composition identical to cerebrospinal fluid – surrounded by membranes derived from the arachnoid mater. They typically do not have any connection with the cisterns in the subarachnoid space and the chambers of the brain. Arachnoid cysts usually occur within the center of the cranial fossa, around the Sylvian fissure – this is the location of approximately 50 percent of all cysts. They appear more often on the left hand side [7]. Other possible locations of the cysts include the cerebello-pontine angle (10%), the area of the cerebellar vermis and the plates of the midbrain cover (20%), in the sellar and episellar area (10%) and the longitudinal fissure of the brain (5%), the vault of the brain (3%) and other locations (2%). Based on the neuroimaging studies of E. Galassi et al., three types of arachnoid cysts around the Sylvian fissure are distinguished [7]. Type I cysts occur around the pole of the temporal lobe without evident penetration into the fissure. Type II cysts enter partly into the lateral fissure reaching the insula. Type III cysts occupy the entire Sylvian fissure. Type III cysts are most often associated with lesions in the cranial bone, such as protrusion in pars squamosa of the temporal bone and elevation of the edges of the lesser wing in the sphenoid bone. Type III cysts are also associated with a shift of the midline of the brain. For very large type III cysts, sometimes the term *temporal lobe agenesis syndrome* has been used, although it is not correct, since the arachnoid cyst is not related to the actual atrophy of the temporal lobe, but rather causes its compression and displacement. According to the histopathological criterion, two types of arachnoid cysts are distinguished. The first type – most common – is the so-called simple cyst, whose walls are built of cells derived from the arachnoid mater; these cells are capable of producing the fluid filling the cyst. The second type is the complex cyst, containing also lining cells and nervous glial cells woven into the wall structure. Arachnoid cysts are usually asymptomatic and are normally detected incidentally, during neuroimaging scans administered for another reason. Symptomatic arachnoid cysts are rare and typically induce signs of increased intracranial pressure, chronic headaches, seizures, and focal neurologic signs. In patients with arachnoid cysts, troubling neurological symptoms may occur rapidly, which is most often associated with bleeding into the cyst, leading to the formation of a subdural hematoma [7, 8]. Among the possible symptoms resulting from the existence of arachnoid cysts, mental symptoms are also mentioned, such as depression, behavioral disorders and psychotic symptoms, mostly schizoid ones [9]. The aim of this study is to describe the case of a 32-year-old man diagnosed with paranoid schizophrenia, who underwent surgical treatment of an extensive arachnoid cyst in the vicinity of the right Sylvian fissure. The report also contains a review of the literature on the possibility of surgical treatment of arachnoid cysts and the relationship between arachnoid cysts and psychotic symptoms in patients.

CASE DESCRIPTION

This paper presents a case of a 32-year old man treated for about a year for psychotic syndrome, diagnosed with paranoid schizophrenia for 7 years. The symptomatic patient, with recognized psychotic symptoms in the form of delusions and auditory hallucinations was treated pharmacologically with anti-psychotic drugs. Throughout the course of the disease, there were periods of exacerbation and remission of psychotic symptoms, especially auditory hallucinations. In December 2010 a significant deterioration in the patient's mental condition occurred. The delusional symptoms exacerbated. They were related to religion and possession and also included auditory hallucinations in the form of hearing the voice of God. Due to the psychosis, the functioning of the patient deteriorated. At the time of admission to the Department of Psychiatry, the patient was diagnosed with psychotic symptoms, which were partially reduced with high doses of anti-psychotic drugs. The patient underwent computer tomography of the head, which revealed an extensive arachnoid cyst around the bottom of the middle cerebral fossa – type III according to Galassi. Given the very large size of the arachnoid cyst, associated with compression of the brain hemisphere and shifting of brain structures, the patient was qualified for surgical treatment. On admission, the patient was in fairly good general condition, conscious, answering questions logically,

with no signs of focal neurologic damage. Some psychomotor slowing was observed, not affecting the patient's consciousness, possibly due to the patient's use of antipsychotic drugs. The clinical condition of the patient was rated at 15 points of the Glasgow Coma Scale (GCS). On the first day of the hospitalization the operation on the patient's cyst was performed. A typical Yasargil craniotomy was carried out under general anesthesia, with the patient positioned on the back, through an arc-shaped incision of the head integument in the right fronto-temporal region. After the bone flap was dissected free, the thinner dura mater, stretched by the cyst, was exposed locally. A semicircular incision was made in it. The exposed cyst wall burst spontaneously, evacuating under fairly high pressure. After emptying the cyst of the fluid content, intraoperatively resembling cerebrospinal fluid, the cyst walls in the form of thickened arachnoid mater were removed. Then by dissecting and removing the arachnoid mater, the optic chiasm cistern was opened, the cistern of lamina terminalis, and the fossa of the brain, by connecting them with the cyst. In the next stage, on the level of the central part of the middle frontal gyrus a small corticotomy was performed, and the lumen of the right lateral ventricle was reached through the tissue of the right frontal lobe, by combining it with the cyst. After hemostasis, the dura mater was sewn tight, the bone was restored and the integument was sutured back. The patient woke up properly; tracheal intubation was removed 2 hours after the surgery. In a clinical test approx. 6 hours after the surgery the patient was fully conscious, with logical contact preserved, and without any signs of focal neurological deficit. On the second day after the surgery the patient's verticalization was commenced. On the fourth day after the surgery a weakening of muscular strength occurred in the patient's distal part of the left upper limb – mainly weakness concerning extension of the hand in the wrist and of fingers in the metacarpophalangeal, phalangeal and interphalangeal joints. A CT scan performed showed minimal reduction in the size of the cyst, and a concomitant swelling of the right brain hemisphere. Anti-edematous medication was introduced along with physical rehabilitation, which resulted in gradual withdrawal of the paresis. On successive days, deterioration contact with the patient deteriorated, his mood and drive became depressed and his muscle tone increased. These symptoms were accompanied by symmetric bradykinesia and tremor in the limbs. The clinical condition also included apathic-abulic syndrome, affecting the patient's drive, as well as hypokinetic-hypertonic syndrome presenting as a motor disorder. Since the surgical treatment of the cyst, the patient showed no positive symptoms. In the course of further hospitalization and treatment at the Department of Psychiatry, the patient's condition had improved further, there had been an increase in his mood and drive and the movement disorders have withdrawn. No recurring symptoms in the form of delusions or hallucinations were observed. In a follow-up MRI scan, within the central region of the cranial fossa on the right side, the area corresponding to the cyst was found to be connected with the subarachnoid and subdural space and the right chamber. The patient remains under control of the Neurosurgical Clinic and under psychiatric care on an outpatient basis.

CONCLUSIONS AND LITERATURE REVIEW

Cases of arachnoid cysts correlating with psychotic symptoms such as hallucinations and delusions are described by few authors. Wong et al. in their dissertation of 1999 described a case of a patient with psychotic symptoms with a large arachnoid cyst connecting with the lateral chamber, similar to the work presented here [14]. Comparable cases were described in 1982 by Colameco et al., and in 1989 by Lacznik et al [6]. In 2007, M. Janas-Kozik wrote a case study report in *Postępy Psychiatrii i Neurologii*, describing the case of paranoid syndrome in a 16-year-old boy with normal-pressure hydrocephalus and an arachnoid cyst [9]. The patient did not undergo operative neurosurgical treatment because of the mediocre expansion the chamber system and the small size of cysts. The patient was under observation in an outpatient setting and follow-up neuroimaging tests were performed. The small number of reports of arachnoid cysts coexisting with psychotic symptoms in the literature worldwide shows that these diseases are casuistic in character. Such cases always raise the question whether the coincidence of psychiatric symptoms with arachnoid cysts or hydrocephalus is random, or whether there is a link between them [1, 2, 3, 4, 13]. An unambiguous answer to this question cannot be found in the available literature. Also no cases were found of patients with positive symptoms who underwent surgical treatment of arachnoid cysts. The authors of the present study failed to find the answer as to whether the withdrawal of these

symptoms was affected by the operational procedure performed or the pharmacological antipsychotic treatment administered [5, 10, 11]. The case of the patient described in this paper certainly requires further observation both in terms of monitoring his mental status and by means of follow-up neuroimaging studies.

REFERENCES

1. Adler L, Rader K, Kolenda H. Endogeniforme affective Psychosen und Normaldruckhydrozephalus.. Psychiatr Prax 1992; 19 (5): 154.6.
2. Barnett GH, Hahn JF, Palmer J. Normal pressure hydrocephalus in children and young adults. Neurosurgery 1987; 20 (6): 904.7.
3. Bloom KK, Kraft WA. Paranoia an unusual presentation of hydrocephalus. Am J Phys Med Rehabil 1998; 77 (2): 157.9.
4. Bret P, Chazal J. Chronic (normal pressure) hydrocephalus in childhood and adolescence. A review of 16 cases and reappraisal of the syndrome. Childs Nerv Syst 1995; 11 (12): 687.91.
5. 8. Bret P, Guyotat J, Chazal J. Is normal pressure hydrocephalus a valid concept in 2002? A reappraisal in five questions and proposal for a new designation of the syndrome as chronic hydrocephalus.. J Neurol Neurosurg Psychiatry 2002; 73: 9.12.
6. Colameco S, DiTomasso RA. Arachnoid cyst associated with psychological disturbance. J Med Soc N J 1982; 79: 209–10.
7. Greenberg M. S.: Handbook of neurosurgery. Thieme Medical Publishers New York 2010: 222-225
8. Handa J, Okamoto K, Sato M. Arachnoid cyst of the middle cranial fossa: Report of bilateral cysts in siblings. Surg Neurol 1981;16: 127-30
9. Janas-Kozik M, Krupka-Matuszak I, Ratka P, Piekarska-Bugiel K, Bednarska-Półtorak K, Tatrocka-Burzawa B., Zespół paranoidalny u 16-letniego chłopca z wodogłowiem normotensyjnym oraz torbielami pajęczynówki, Postępy Psychiatrii i Neurologii 2007; 16, suplement 1 (21): 13-15
10. Kwantus JA, Hart RP. Normal pressure hydrocephalus presenting as mania. J Nerv Ment Dis 1987; 175 (8): 500.2.
11. Pinner G, Johnson H, Bouman WP, Isaacs J. Psychiatric manifestations of normal pressure hydrocephalus: a short review and unusual case. Int Psychogeriatr 1997; 9 (4): 465.70.
12. Pomeranz S, Constantini S, Lubettzki-Korn I, Amir N. Familial intracranial arachnoid cysts. Childs Nerv Syst 1991;7:100-2.
13. Prockop LD. Zaburzenia przepływu i składu płynu mózgowo- rdzeniowego. Wodogłowie. W: Kwieciński H, Kamińska AM, red. Neurologia Merritta. Wroc³aw: Urban & Partner; 2004: 283.5.
14. Won-Myong B, Chi-Un P, Jeong-Ho C, Tae-Youn J, Kwang-Soo K. A case of brief psychosis associated with an arachnoid cyst. Psychiatry Clin Neurosci 2002; 56: 203-5.

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