NORMAL-PRESSURE HYDROCEPHALUS. CASE REPORT

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Keywords: pressure	normal	Abstract: Normal-pressure hydrocephalus is a curable neurological disease, described by Adams and Hakim in 1965, characterized by gait disturbance, urinary incontinence, dementia or cognitive disorders
hydrocephalu. and Adam' cranial ventriculoperi shunt	s, Hakim s triad, CT, toneal	that occur generally in the sixth and seventh decades of life. It has diverse etiology: post subarachnoid hemorrhage, traumatic after posterior fossa surgery, stenosis of aqueduct of Sylvius. In 60% of cases, no cause is identified. Imaging reveals enlargement of the lateral ventricles with compression or thinning of the corpus callosum. Hakim and Adams (1965) offered the hypothesis of "hydraulic press" to explain the enlargement of the ventricles. They said that the process begins with an initial period of increased intraventricular pressure, leading to ventricular dilatation. After the pressure returns to normal, the pulsation of the cerebrospinal fluid acts on a large area of the ventricular walls, as an increased downforce.
Cuvinte hidrocefalie presiune	cheie: cu normală,	Rezumat: Hidrocefalia cu presiune normală, este o boală neurologică tratabilă, descrisă de Hakim și Adams în 1965, caracterizată prin tulburări de mers, incontiență urinară, demență sau tulburări cognitive care apar, în general, în a șasea și a șaptea decadă a vieții. Are etiologie diversă: post

hic pre triada lui Hakim și Adams, CT cranian, shunt ventriculoperitoneal

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și ri st hemoragie subarahnoidiană, posttraumatică, după intervenții chirurgicale pe fosa posterioară, stenoza de apeduct Sylvius. În 60% din cazuri, cauza nu este identificată. Imagistica evidențiază lărgirea ventriculilor laterali cu compresia sau subțierea corpului calos. Hakim și Adams (1965) au oferit ipoteza " presei hidraulice", pentru a explica lărgirea ventriculilor. Ei au precizat că procesul începe cu o perioadă inițială de presiune intraventriculară crescută, ce duce la dilatarea ventriculară. După ce presiunea revine la normal, pulsația LCR-ului acționează asupra unei suprafețe mai mari de la nivelul pereților ventriculari, ca o forță de apăsare crescută.

INTRODUCTION

Hakim and Adams (1965) offered the hypothesis of "hydraulic press" to explain the enlargement of the ventricles.(4) They said that the process begins with an initial period of increased intraventricular pressure, leading to ventricular dilatation. After the pressure returns to normal, the pulsation of the cerebrospinal fluid acts on a large area of the ventricular walls, as an increased downforce. There are no reliable data, but it is estimated that approximately 30% of these patients have a significant history regarding head trauma. It must have had sufficient severity, including loss of consciousness, to be considered as a causative factor. Normal-pressure hydrocephalus (NPH) develops in chronic phase of the craniocerebral trauma in weeks, sometimes months after the original impact. Among cases of NPH, only 10-20% are symptomatic. Because the clinical picture is often associated with the aging process and because the majority of patients with normal pressure hydrocephalus were aged over 60 years old, they assume that they must adapt to these changes.(5) Thus, the symptoms may occur months or even years before the patient sees a doctor. The symptoms of normal-pressure hydrocephalus progress over time.(6) The pace of development is variable and it is often accompanied by a crisis of loss of consciousness that brings the patient to the doctor.

CASE REPORT

We present the case of a male patient, M.G., aged 60 years old, without significant personal pathological antecedents,

admitted to the Infectious Diseases Clinic of Alba County for a febrile episode and gait disturbance. Lumbar puncture is performed, the cerebrospinal fluid examination revealing 330 elements and increased proteinuria. Cranial CT scan reveals an internal normal-pressure hydrocephalus. Diagnosis of viral meningoencephalitis and internal normal-pressure hydrocephalus is set and the patient is referred to a specialised centre for the management of hydrocephalus therapeutic conduct.

In the Neurosurgery Department of Sibiu, upon the patient's examination, a febrile syndrome with gait disturbance has been found, clumsy gait initiation, sphincter disorders of incontinence type and mental disorders. Cerebrospinal fluid examination: 28 elements, smear with 100% mature lymphocytes, proteinuria 1.139 g/l, sterile culture media. Infectious disease consultation recommends the continuation of the therapy. In the context of the data obtained, the surgical intervention is delayed until the patient's clinical and biological parameters return to normal. After repeated evacuating punctures, there is a clear improvement of patient's symptoms.

After about a month of hospitalization, the patient returns to the Neurosurgery Department of Sibiu, neurological symptoms being aggravated, emphasizing motor deficits. CT scan, conducted on emergency, highlights communicating panventricular hydrocephalus with signs of activity (periventricular edema was visible and accentuated compared to the previous examination (figure no. 1).

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Figure no. 1. Hydrocephalus with periventricular edema



After repeated evacuating punctures, there is a clear improvement of the patient's symptoms. Cerebrospinal fluid examination: 4 elements, proteinuria 618 g> l. A drainage ventriculoperitoneal shunt with low pressure valve is installed. Postoperatively, the patient's status is favourable. The control CT scan highlights normal appearance after surgery, the correct positioning of the drainage system and its normal functioning (figure no. 2).

Figure no. 2. Normal postoperative appearance



The patient is discharged with an improvement of symptoms and normal gait (figure no. 3), as well as without mental and sphincter disorders.

Figure no. 3. Postoperative gait appearance



DISCUSSIONS

Normal-pressure hydrocephalus represents more than 5% of all dementias. Dementia in normal-pressure hydrocephalus is characterized by subcortical cognitive deficits involving psychomotor slowing and impaired executive functions.(1) These deficits are often misinterpreted as a consequence of the old age of the patient. Motor function disorders are primarily gait and balance abnormalities and extrapyramidal signs.(2) Balance disorders show varying degrees of severity, from minor imbalance to the impossibility to maintain orthostatism. For many patients, the gait is "hypodynamic" slowly, with frequent stops and small uncertain steps. The patient may have trouble lifting the legs, when climbing the stairs or changing direction, which cause repeated failures.(3) The most powerful gait abnormality is gait dyspraxia.

Bladder control damage ranges from an increase in urinary frequency above the usual number of 3-5 / 24h, common in the early stages, up to a complete loss of conscious and voluntary control of bladder continence (urinary incontinence) in severe cases. Frequency of urination can sometimes reach 12-24/24h, urinating having a compelling character. Rarely, fecal incontinence can be installed. Some patients do not exhibit such symptomatology. Extrapyramidal signs are common and include resting tremor, cogwheel rigidity, facies like a mask, hypotonia and generalized bradykinesia. Imaging reveals enlargement of the lateral ventricles with compression or thinning of the corpus callosum.(5) The differential diagnosis between normal pressure hydrocephalus and hydrocephalus caused by cerebral atrophy is difficult, if not impossible and it is set only on clinical grounds.(6)

Diagnosis is mainly based on the outcome of the complementary investigations, particularly on radiological and radioisotope studies.(6) Post-traumatic normal-pressure hydrocephalus is defined as an association of posttraumatic hydrocephalus with normal or slightly increased intracranial pressure, dementia, balance disorder and / or urinary incontinence.(4) The clinical effect of shunt in patients with this syndrome is sometimes great, but generally only 50-60% of patients benefit from this treatment.(6)

The patient presents the classical clinical symptomatology of normal pressure hydrocephalus, but the onset is atypical being triggered after a viral respiratory infection with secondary meningeal involvement, without a history of craniocerebral trauma. Cytological changes and increased protein content of the cerebrospinal fluid postponed the surgical intervention, assembling the drainage system after the normalization of the biological samples but with the worsening of the neurological signs. Postoperative evolution after the installation of the drainage system was favourable with the remission of the motor deficits the next day and the progressive improvement of the associated symptoms.

CONCLUSIONS

- 1. Latent hydrocephalus may become manifest after an infectious episode.
- 2. Preoperative cerebrospinal fluid examination is compulsory.
- 3. Preoperative lumbar puncture may be an indicator of postoperative clinical course.
- 4. Worsening of neurological symptoms require ventriculoperitoneal drainage.
- 5. Correct diagnosis, prompt treatment will result in the rapid and complete recovery of the patient with his full social reintegration.

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