

CASE REPORT

Neurocysticercosis – non-specific clinical and neuroradiological presentation

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Abstract

Neurocysticercosis (cysticercosis cerebri) is a rare neurological diagnosis in Croatia. It is classically divided into four types: intraparenchymal, basilar cisternal, ventricular and diffuse. Computerized tomography (CT) and magnetic resonance imaging (MRI) established the diagnosis by demonstrating cysticercosis disseminated throughout the cerebral parenchyma. The authors emphasize the potential of the ELISA test to detect anticysticercosis antibodies in blood and cerebrospinal liquor (CSF). Diagnostics of neurocysticercosis is enabled jointly by clinical signs, neuroradiological, serum and liquor tests. We report the case of a 70-year old man with clinical and neuroradiological signs of cysticercosis cerebri. The neurological status is dominated by ataxia, corticospinal pathways damages and cognitive capacity impairments. CT of the brain shows calcificated and cystic lesions of various sizes. MRI of the brain enables the final diagnosis of the cysticercosis cerebri with multiple and multicentric lesions that indicate various stages of the cerebral cysticercosis (*Fig. 2, Ref. 20*). Full Text (Free, PDF) www.bmj.sk. Key words: neurocysticercosis, computed tomography (CT), magnetic resonance imaging (MRI), ELISA.

Neurocysticercosis, infection of the central nervous system (CNS) by larvae of the pork tapeworm *Taenia solium*, is the most common neuroparasitic infection in humans. Active neurocysticercosis (NCC) may be parenchymal and extraparenchymal NCC. Neurocysticercosis is classically divided into four general types: intraparenchymal, basilar cisternal, ventricular and diffuse cerebral (1–3). Clinical presentation neurocysticercosis (cerebral cysticercosis) included increased intracranial pressure, headache, focal neurological deficit and seizure, meningoencephalitis, chronic remittent serous meningitis (4, 5). Increased intracranial pressure (ICP) was caused by hydrocephalus, by intracranial mass lesion (tumoral form) and by pseudotumor cerebri (pseudotumoral form) (6–8). The authors emphasize the importance of ELISA test in the detection of anticysticercosis antibodies in blood and cerebrospinal liquor (CSF). Computerized tomography, magnetic resonance imaging, immunological test in the serum and cerebrospinal fluid are available options to diagnose the condition (9–15).

Case report

70-year old man shows signs of decreased cognitive capacity, delayed memorization and processing of the task sets. A left-side

sway occurs abruptly, when walking or standing. Myotatic reflexes are increased, with subclonus of the left patellar reflex and clonus of the left Achilles-tendon reflex, and subclonus of the right Achilles tendon, right Babinski's reflex, trunk ataxia. Mini mental tests (MMS) were administered (18 points) and showed the cognition capacity impairment. CT of the brain (by Siemens Somatom EMOTION 2000) shows multiple lesions with dimensions up to 2 cm. In the pons there is a suspected punctiform hyperdensity. In the left thalamus a solid lesion and a cystic lesion up to 1.5 cm in size are evident. In the right thalamus, there is a hyperdense lesion about 1.8 cm in size. Multiple hyperdense lesions are evident also bilaterally frontally, occipitally and left temporally. The occipital and the parietal lesions are partly cal-

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Fig. 1. CT of the brain with contrast applied – diffuse atrophic changes with dilatation of liquor spaces, bilateral occipital hyperdense lesions, marked right-sided hyperdensity in the thalamus, and periventricular punctiform lesions.

cified. Diffuse atrophic changes resulting in dilatation of all liquor spaces. The ventricular structures are pushed medially with no relocation of asymmetrical lateral brain ventricles (Fig. 1).

MRI of the brain (by Shimadzu EPIOS 0.5T) showed status after parasitary infection of the brain with multiple multicentric lesions. Near the right thalamus there is an annular hypertensive signal in T1 and T2-weighted images, without a postcontrast opacification (Fig. 2).

The serum and liquor tests, including the ELISA test for cysticercosis, are negative, as well as the toxoplasmosis, echinococcus and neurotropic viruses tests. The immunological tests are negative. The radiological examination of the lungs showed no pathomorphological changes.

Discussion

Everything indicates that this is a case of isolated cysticercosis of a very much non-specific clinical status. It is well known that the most often symptoms of this disease are epileptic seizures, headache, high intracranial pressure, which have not been registered with this patient (6–8). Other authors (16) describe impairments of cognition with a number of patients, measured on the MMS scale, and impaired cognition abilities have been found with our patient. The truncal ataxia and damages of the corticospinal way, dominating with our patient, but with no signs



Fig. 2. MRI of the brain in T2 weighted images; sagittal cross section – annular hypertensive formation in T2 images, multiple multicentric hypointensive lesions, widened liquor spaces with diffuse atrophic changes.

of high intracranial pressure, make an atypical image of neurocysticercosis. However, the neurological dysfunctions and the clinical status are explained by multiple multicentric lesions, whereas no appearance of headaches and high intracranial pressure may be explained with marked atrophic changes of the brain. The basic diagnostic leads (17, 18), however, are the neuroradiological tests, CT and MRI of the brain, showing calcified formations (19,20) as well as certain stages of the larvae development. The ELISA tests are false negative in almost a half of other authors' patients (15, 20), wherefore they cannot be deemed neither specific nor sensitive tests. In our research, with a non-specific clinical status and specific image of the calcified multiple changes of the brain established by CT, and characteristic multiple lesions of the brain that show cysticercs in various development stages, make basis of diagnostics of neurocysticercosis. The brain lesions present explain the neurological signs of the disease, totally non-specific for the disease.

References

1. Monteiro L, Coelho T, Stocker A. Neurocysticercosis — a review of 231 cases. *Infection* 1992; 20 (2): 61–65.
2. Monteiro L, Almeida-Pinto J, Stocker A, Sampaio-Silva M. Active neurocysticercosis, parenchymal and extraparenchymal: a study of 38 patients. *J Neurol* 1993; 241 (1): 15–21.
3. Siqueira EB, Richardson RR, Kranzler LI. Cysticercosis cerebri occluding the foramen Monro. *Surg Neurol* 1980; 13 (6): 429–431.
4. Couldwell WT, Zee CS, Apuzzo ML. Definition of the role of contemporary surgical management in cisternal and parenchymatous cysticercosis cerebri. *Neurosurgery* 1991; 28 (2): 231–237.

5. Belman EL, Kalkun VR. Clinical picture of cerebral cysticercosis. *Zh Nevropatol Psikhiatr Im S S Korsakova* 1978; 78 (6): 807–812.
6. Colli BO, Martelli N, Assirati Junior JA, Machado HR, Salvareni CP, Sassoli VP, Forjaz SV. Cysticercosis of the central nervous system. I. Surgical treatment of cerebral cysticercosis: a 23 years experience in the Hospital das Clinicas of Ribeirao Preto Medical School. *Arq Neuropsiquiat* 1994; 52 (2): 166–186.
7. Madrazo I, Sandoval M, Gonzalez D. Evaluation of the hypothalamic-hypophyseal Axis in patients with hypertensive hydrocephalus due to neurocysticercosis. *Arch Invest Med* 1991; 22 (2): 113–115.
8. Sandoval M, Madrazo I, Garcia-Renteria JA, Maldonado JA, Lopez-Camacho O. Valvular dysfunction due to the obstruction of the ventricular catheter caused by cysticercus cyst. *Arch Invest Med* 1991; 22 (2): 117–120.
9. Das A, Goyal R, Saxena S, Singh NP. Diagnosis of neurocysticercosis by enzyme-linked immunosorbent assay. *J Indian Med Assoc* 2005;103 (10): 528–529.
10. Velasco TR, Zanello PA, Dalmagro CL, Araujo D Jr, Santos AC, Bianchin MM, Alexandre V Jr, Walz R, Assirati JA, Carlotti CG Jr, Takayanagui OM, Sakamoto AC, Leite JP. Calcified cysticercotic lesions and intractable epilepsy: a cross sectional study of 512 patients. *J Neurol Neurosurg Psychiat* 2006; 77 (4): 485–488.
11. Poeschl P, Janzen A, Schuierer G, Winkler J, Bogdahn U, Steinbrecher A. Calcified neurocysticercosis lesions trigger symptomatic inflammation during antiparasitic therapy. *Amer J Neuroradiol* 2006; 27 (3): 653–655.
12. Prasad KN, Chawla S, Prasad A, Tripathi M, Husain N, Gupta RK. Clinical signs for identification of neurocysticercosis in swine naturally infected with *Taenia solium*. *Parasitol Int* 2006; 55 (2): 151–154.
13. Casanova CS, Ribeiro MJ, Goncalves RR, Faria LC, Peralta JM, Puccioni-Sohler M. Influence of the cerebrospinal fluid laboratory parameters in the ELISA test for neurocysticercosis using a total cysticerci antigen. *Arq Neuropsiquiat* 2006; 64 (1): 55–59.
14. Agudelo P, Botero D, Palacio LG. Evaluation of the ELISA method for diagnosis of human cysticercosis in an endemic region. *Biomedica* 2005; 25 (4): 488–495.
15. Kalra V, Sethi A. Childhood neurocysticercosis-epidemiology, diagnosis and course. *Acta Paediat Jpn* 1992; 34 (3): 365–370.
16. Diagana M, Cruz ME, Tabo A, Cruz I, Dumas M, Preux PM. Cognitive disorders in an Andean community located in a cysticercosis endemic zone of Ecuador. *Med Trop* 2005; 65 (4): 343–345.
17. Ignacio Madrazo N, Olhagaray B, Becerra M, Sandoval MA, raul Soto L. Acute cysticercosis encephalitis: description of a histologically confirmed case. *Neurosurgery* 1983; 13 (5): 593–595.
18. Finsterer J, Li M, Rasmkogeler K, Auer H. Chronic long-standing headache due to neurocysticercosis. *Headache* 2006; 46 (3): 523–524.
19. Sharma K, Gupta RK. Scan-negative neurocysticercosis. *Pediatr Neurosurg* 1993; 19 (4): 206–208.
20. Zhang Yo, Zhao GG, Li KC, Li JY, Yu T, Wang L, Li YJ. MRI-guided stereotactic biopsy for questionable diseases in brain. *Zhaonghua Wai Ke Za Zhi* 2003; 41 (9): 667–669.

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