

Nonspecific dizziness as an unusual presentation of neurocysticercosis

A case report

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Abstract

Rationale: Neurocysticercosis (NCC) can cause lesions across the central nervous system, leading to varying clinical manifestations. While the presentation of nonspecific symptom is rare, they are easy to ignore. The present report documents a case of NCC that manifested as persistent dizziness.

Patient concerns: A Chinese woman visited the hospital on account of dizziness, the severity of which had increased gradually over the month prior.

Diagnoses: Head computed tomography and magnetic resonance imaging (MRI) revealed hydrocephalus. Cervical MRI revealed an abnormal object in the spinal canal at the junction of the medulla oblongata and C1, which blocked the circulation cerebrospinal fluid circulation and caused the enlargement of the ventricles.

Intervention: The patient underwent surgical treatment. The abnormal object was removed, and a diagnosis of NCC was considered by pathological examination.

Outcome: The patient's dizziness resolved after surgical treatment, and no other symptoms appeared thereafter.

Lesson: Clinicians should not ignore nonspecific clinical symptoms, as they may indicate hydrocephalus.

Abbreviations: CNS = central nervous system, CSF = cerebrospinal fluid, CT = computed tomography, MRI = magnetic resonance imaging, NCC = neurocysticercosis.

Keywords: dizziness, hydrocephalus, neurocysticercosis

1. Introduction

Neurocysticercosis (NCC) is caused by the infection of the central nervous system (CNS) by the larvae of *Taenia solium*.^[1] In developing countries, NCC is the most common cause of epilepsy and hydrocephalus in adults. Healthy individuals may contract the disease by drinking water contaminated by feces containing tapeworms or by eating contaminated vegetables.

While NCC may affect the brain parenchyma, cistern, subarachnoid space, or intraventricular region, NCC-induced lesions are most commonly found in the cerebral hemispheres.^[2]

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Informed written consent was obtained from the patient for publication of this case report and accompanying images.

The authors have no conflict of interest to disclose.

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The present report documents the case of a woman with dizziness, which is a nonspecific clinical symptom of hydrocephalus. Clinicians should assess imaging findings to detect enlargement of the ventricles and continue to explore the underlying causes. While mastering the specific clinical manifestations of hydrocephalus, clinicians should not ignore nonspecific clinical symptoms. Our case highlights the fact that early hydrocephalus caused by subarachnoid NCC can lead to blockage in the circulation of cerebrospinal fluid (CSF). As such, the clinical manifestations of this condition are not specific, but the early period is critical for diagnosis and treatment. Clinicians, therefore, need to be more aware of cysticercosis. Patients living in remote areas should also be educated about this disease and the fact that eating uncooked vegetables as a dietary habit may cause this disease to spread.

2. Case report

A 52-year-old woman presented at the Department of Neurology after having experienced dizziness throughout the month before her visit. She lived in a remote nontropical area of China. The patient had type 2 diabetes and had received a hysterectomy 2 years prior. She kept dogs and chickens and maintained a diet of uncooked vegetables. She had never left her hometown before the onset of her symptoms. Neurological examination revealed no obvious abnormalities. A subsequent computed tomography (CT) scan of her head revealed enlargement of the ventricles (Fig. 1A). Findings from magnetic resonance imaging (MRI) of the head indicated hydrocephalus (Fig. 1B and C), while MRI of the cervical spine revealed the presence of an abnormal object in the spinal canal at the junction of the medulla oblongata and C1

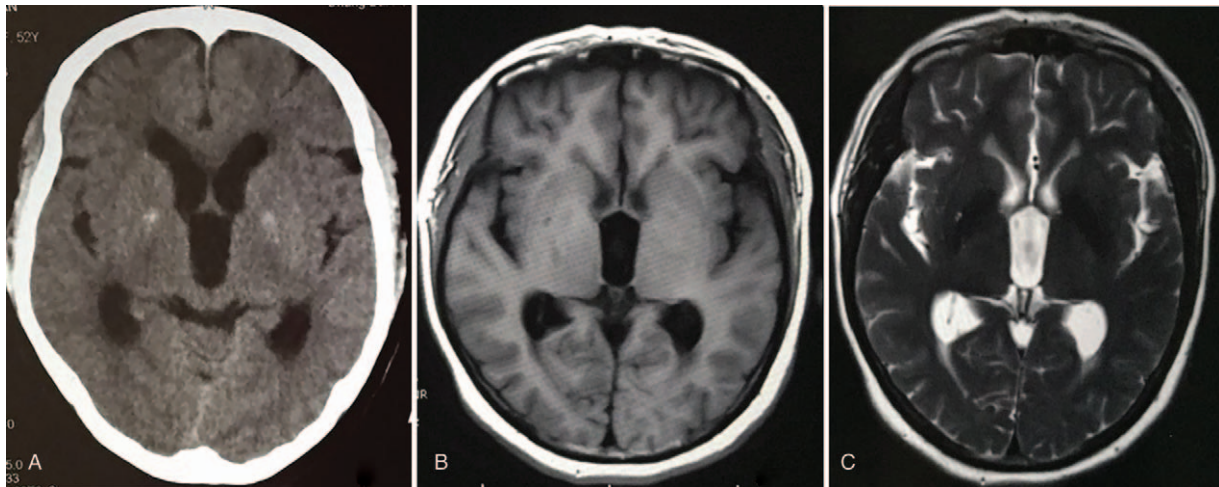


Figure 1. Head computed tomography (A) and magnetic resonance imaging (B and C) images show enlarged ventricles.

(Fig. 2A and B). Slight uneven enhancement of the abnormal object was evident (Fig. 2C). These features caused a blockage in the subarachnoid circulation, causing hydrocephalus. The patient subsequently underwent surgery, and the abnormal object was removed (Fig. 3A and B). Pathological examination indicated that the abnormal was a cysticercus (Fig. 3C and D). Serum IgG was positive for anti-cysticercosis antibodies, thus confirming the pathological diagnosis. The patient's dizziness resolved after surgical treatment, and no other symptoms appeared thereafter.

The patient has provided informed consent for publication of this case.

3. Discussion

T solium cysticercosis is recognized as a neglected tropical disease by the World Health Organization (WHO) and mainly occurs in developing countries of Latin America, sub-Saharan Africa, and Asia. The ingestion of raw and/or undercooked food containing

active *T solium* cysticerci may result in *T solium* taeniasis, a condition in which the adult tapeworm is found in the human intestine.^[3] The eggs of the adult tapeworm are subsequently shed in stool, completing the cycle.

Cysticercosis affects muscles, skin, eyes, and CNS. Among cysticercosis cases, NCC is quite common (60–90%).^[3] The most frequently site of CNS infection is the brain parenchyma, and consequent lesions most commonly present at the junction between the gray and the white matter. Spinal cysticercosis is relatively rare, accounting for only 0.7% to 5.8% of all NCC cases.^[4] Lesions have been reported at the cervicomedullary/cervical (20%), thoracic (30%), lumbar (19%), and even multiple levels (30%).^[4] Symptoms result from the direct compression of the spinal cord or roots by a mass effect caused by the cysticerci, arachnoiditis, obstruction of CSF flow, and hydrocephalus. The most common clinical signs are myelopathy, progressive weakness, and, in advanced cases, paraparesis and paraplegia. Other clinical manifestations of spinal involvement include bowel and bladder



Figure 2. (A and B) Magnetic resonance imaging of the cervical spine revealed the presence of an abnormal object in the spinal canal at the junction of the medulla oblongata and C1. (C) Image of enhanced magnetic resonance scanning of the cervical spine reveals slight uneven enhancement of the abnormal object.

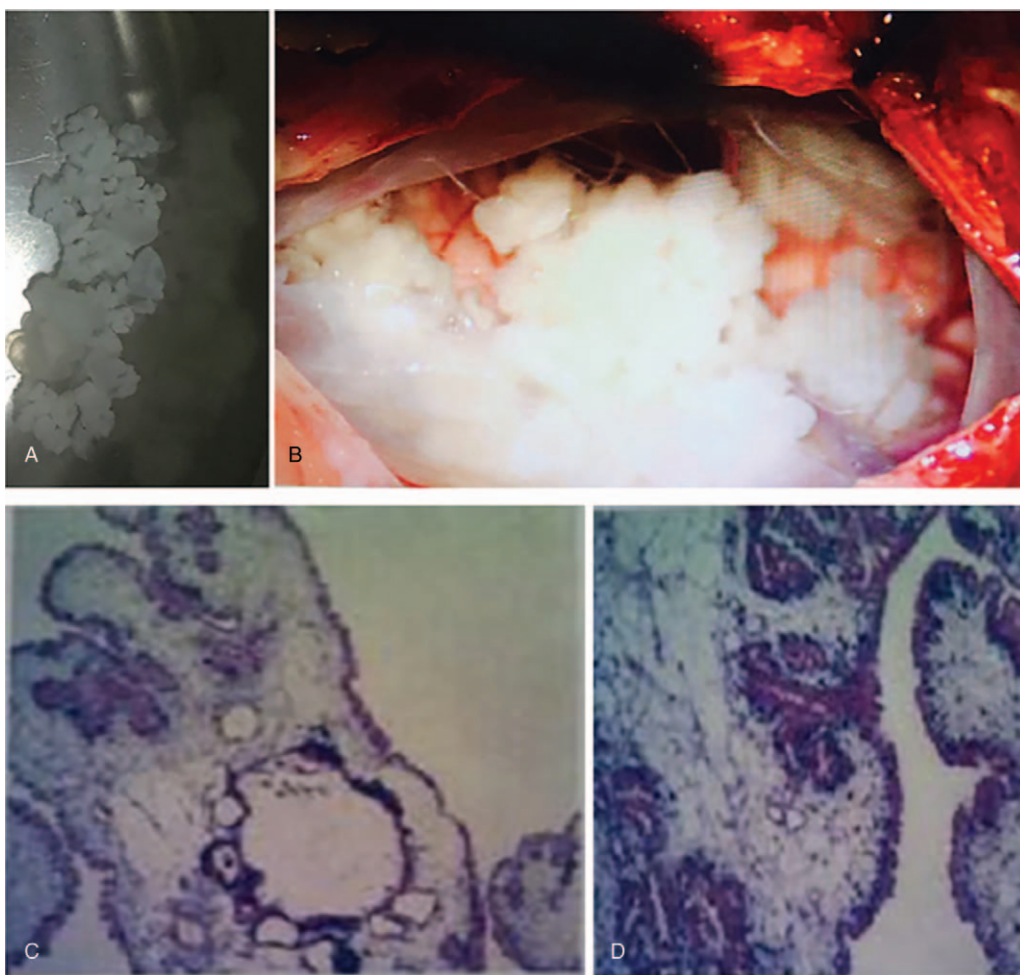


Figure 3. (A and B) The abnormal object was removed. (C and D) Images of the pathological examination.

incontinence and sexual dysfunction.^[4] In the present case, the patient's brain parenchyma and spinal cord were not involved, but her CSF circulation pathway was blocked from the end of the medulla oblongata to the cervical spinal cord. Despite the progression of the infection, the patient only exhibited dizziness; she did not have any symptoms of hydrocephalus-induced intracranial hypertension, such as jet vomiting or headache. Simple dizziness is a common symptom to neurologists but can easily be attributed to any one of several causes, such as cerebrovascular disease or peripheral vertigo. It is rare that hydrocephalus causes only dizziness; the specific reason for this finding is unclear. To the best of our knowledge, this is the first report of a patient with NCC whose only symptom was dizziness.

As clinicians continue to investigate the causes underlying a given patient's symptoms, imaging results should continually be evaluated for early indications of hydrocephalus. As our case highlights, early hydrocephalus caused by subarachnoid NCC can lead to the blockage of CSF circulation despite the minimal presentation of symptoms. Moreover, while the clinical manifestations of hydrocephalus are nonspecific, the early diagnosis of the condition is critical to its treatment.

The diagnosis of NCC depends on clinical history, ethnic background, the presence of cystic lesions with or without a scolex (i.e., the anterior end of a tapeworm) on imaging studies,

and histological evidence of a parasite.^[3] The presence of a cystic lesion on imaging with an eccentric "dot" representing the scolex can confirm the diagnosis of NCC. In CT images, the scolex is usually hyperdense, while it appears hypointense (dark) on T2-weighted magnetic resonance images.^[5] Myelography and postmyelography CTs can be useful in detecting small subarachnoid spinal NCC.^[4] While blood tests can confirm the diagnosis of cysticercosis; however, we did not perform any blood test for the patient, before the surgery.

The mainstay treatment of NCC involves symptomatic therapy. Cysticidal drugs were first introduced to address NCC in the late 1970s (praziquantel) and 1980s (albendazole). As most patients with NCC present with seizures, antiepileptic drugs should also be administered. Steroid therapy may be required in some cases to control edema associated with the lesions.^[5] Surgery is indicated in most cases of spinal NCC. Indications for surgical intervention include the presence of severe and progressive symptoms or acute neurological deterioration.^[4] In this case, the patient was treated surgically to relieve the obstruction of CSF circulation caused by NCC; the patient's hydrocephalus and, dizziness were thereby resolved.

The present case report serves as a reminder that clinicians need to consider cysticercosis when patients present with nonspecific symptoms. Patients living in remote areas should also be educated

concerning cysticercosis and that eating uncooked vegetables as a dietary habit may cause the disease to spread.

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Author contributions

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