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Clinical Pearls

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Intraventricular neurocysticercosis in a migrant from Honduras

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A 22-year-old female patient from Choluteca (Honduras) arrived at Madrid (Spain) in January 2022. She had been living in a rural area with her parents and five siblings. Their household included chickens and cows, and they regularly consumed boiled cow's milk. Eight months later, the patient came to the emergency department (ED) with a headache of occipital and biparietal predominance of 1 year of evolution, diplopia and retroocular pain. The patient reported having self-limited migraine episodes since childhood. In the ED, the patient experienced a decreased level of consciousness, exotropia of the right eye but no speech impairment. Cranial computed tomography (CT) scan showed a non-communicating hydrocephalus, lateral ventricles and third ventricle that was dilated with the preservation of the fourth ventricle. The CT scan showed an isodense rounded structure among the cerebrospinal fluid (CSF) with an inner hyperdense focus, in keeping with calcification at the level of the third ventricle corresponding with the scolex and hooks of *Taenia* spp. (Figure 1A). The sagittal reconstruction of the CT also showed an oval structure with a hyperdense focus (Figure 1B). This is characteristic of the vesicular stage of neurocysticercosis (NCC) disease. Ventricular cysticerci account for only 33% of NCC cases.[1] The lesion blocked the drainage of CSF into the fourth ventricle. The patient required an urgent placement of an external ventricular shunt with CSF drainage.

Three days later, a contrast-enhanced magnetic resonance imaging (MRI) was performed. The sagittal T1 with contrast demonstrated a round almost isointense with the CSF structure at the level of the fourth ventricle with a faint peripheral enhancement, suggestive of cystic lesion (Figure 1C).

The diagnosis of screening was performed by detection of IgG for *Taenia sollium* in serum and CSF by ELISA technique Novalisa™ (NovaTec Immundiagnostica GmbH®, Dietzenbach, Germany). The technique was positive for serum with a value of 2.63 and for CSF (1.38) (reference values: 1.00–1.10). However, these techniques have a sensitivity of around 40% and a specificity of 75% for the diagnosis of NCC due to cross-reactions with other parasitic infections such us hydatic disease or hymenolepiasis.[2] The Chagas, HTLV-1/2 and *Strongyloides* spp. serologies were negative.

The diagnosis of NCC was confirmed at the National Center of Microbiology (Majadahonda, Madrid, Spain) by lentil lectin-bound glycoproteins enzyme-linked immunoelectrotransfer blot (LLGP-EITB).[3,4] This technique is one of the best documented serological tests for the diagnosis of NCC, with a sensitivity and

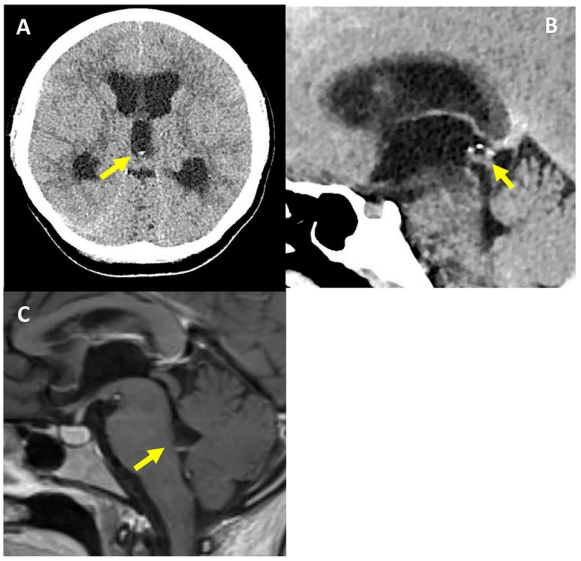

Figure 1. (A) CT scan (axial section) shows a cyst at the level of the third ventricle with central scolex; (B) CT scan (sagittal section) showing also the scolex at the level of the third ventricle; (C) MRI T1 post-gad (sagittal section) showing isodense cyst with CSF at the level of the fourth ventricle after placement of ventricular shunt.

specificity of around 99–100% for patients with more than one viable cyst.[1] This test allows the detection of specific antibodies against seven specific glycoproteins of *T. sollium*. The presence of one or more bands implies a confirmatory result of NCC disease. The specific detection of some antibodies makes it possible to suggest the time of infection.[4] The patient's serum showed positive for glycoproteins 21, 24–21, 42 and 50 kb, indicating the possible presence of an active cyst[4] in accordance with the imagen presented by the cyst located at the third ventricle. The patient underwent surgery for the placement of a ventriculoperitoneal shunt. Subsequently, she received treatment with albendazole, preceded by dexamethasone, following the conventional dosage regimen of 15 mg/kg/day which was divided into two doses for a duration of 15 days. In our specific case, the surgical team decided to adopt a follow-up approach for our patient with radiological monitoring. The neurosurgeons encountered technical difficulties in performing endoscopic removal despite considering as it the optimal option for most patients with NCC as per international guidelines.[5,6] Additionally, the patient showed a positive response to pharmacological treatment, which further supported the decision not to proceed with surgical removal at this time. At present, the patient continues to undergo regular medical check-ups that will assess the possible future surgical approach. The NCC is caused by the consumption of water or food contaminated with gravid proglottids or *T. sollium* eggs, or cohabitation with an adult carrier of *T. solium*. Indeed, most cases are thought to be due to intra-familial contamination.[1] These *T. solium* infection's risk factors are prevalent in rural or low-income areas and have been reported in Honduras.[7]

We conducted screening tests on the patient's family members who lived with her, including her mother and one little sister, both of whom tested negative. No other family members exhibited associated neurological symptoms.

In summary, we report a case of non-endemic NCC in an immigrant in Europe.[8] The patient presented with active intraventricular NCC confirmed by epidemiological (originating from Honduras which is a country endemic for NCC), radiological (presence of intraventricular cyst at the level of the third/fourth ventricle in vesicular stage) and microbiological (IgG ELISA and LLGP-EITB positive) criteria.

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Authors' contributions

Writing—original draft: A.M.-B., C.U.; writing—review and editing: C.U., I.F.-R., B.D.-P., A.H.-G., M.J.P., J.G.-R., M.D.-M.; conceptualization: CDG, Y.U.-T.; clinical diagnoses: B.D.-P., Y.U.-T., M.D.-M.; specific microbiological diagnostics: D.M.-V., A.G.-A., I.F.-R., A.H.-G., M.J.P.

CRediT author statement

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