Unusual Presentation of Cysticercosis

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Introduction

Neurocysticercosis (NCC) is a significant public health concern in India, particularly in regions where sanitation and hygiene practices are suboptimal. It is a parasitic infection of the brain caused by the larvae of the pork tapeworm, *Taenia solium*[1]. Neurocysticercosis can have various neurological manifestations and clinical presentations in affected individuals. However, this case report highlights an exceptional scenario where neurocysticercosis triggers inflammatory responses extending beyond the confines of the central nervous system, leading to obstructive uropathy—an atypical presentation rarely documented in medical literature[2,3]. This unique manifestation underscores the diverse and potentially far-reaching complications of neurocysticercosis, necessitating a thorough understanding of its pathophysiology and clinical implications. This report aims to elucidate the unusual clinical course, diagnostic challenges, and management considerations associated with this rare presentation of neurocysticercosis-induced obstructive uropathy[4]. Both a brain MRI and a non-contrast CT scan is recommended for classifying patients with newly diagnosed NCC[5].

Pathophysiology[5]

Neurocysticercosis results from the invasion of the central nervous system by larvae of the pork tapeworm, *Taenia solium*. Ingested through contaminated food or water, these larvae develop into cysticerci in the brain. As cysticerci provoke an immune response, inflammation ensues, leading to the formation of granulomas and edema. The inflammatory process can disrupt neural tissue and interfere with normal brain function, manifesting seizures, headaches, and cognitive deficits. Cysticerci may also obstruct cerebrospinal fluid flow, potentially causing hydrocephalus. Neuroimaging and serological tests aid in diagnosis by revealing characteristic cystic lesions. Neurocysticercosis presents a complex pathophysiology, often resulting in significant neurological complications. Rarely, neurocysticercosis, caused by *Taenia solium* larvae, triggers inflammatory responses extending beyond the central nervous system, potentially leading to obstructive uropathy. This uncommon complication results from inflammation affecting the urinary system, causing blockages, and disrupting normal urine flow. Other differentials of ring enhancing lesions include abscess, glioma, multiple sclerosis, toxoplasmosis, sub acute infarct, and resolving hematoma.

Common clinical features encompass epileptic seizures, cephalalgia, cognitive impairment, and signs indicative of heightened intracranial pressure, such as nausea, emesis, and visual disturbances.

Preventive measures for neurocysticercosis primarily revolve around mitigating the risk of exposure to the parasite. This entails:

- Enhanced sanitation and hygiene protocols: Implementation of measures to ensure proper disposal of human excreta and promotion of rigorous hand hygiene practices to curtail fecal-oral transmission of Taenia solium eggs.
- Thorough cooking of meat products: Adequate cooking temperatures are sufficient to neutralize the larvae, thereby averting ingestion of viable cysts.
- Health education initiatives: Launching public health campaigns to disseminate information about the perils of neurocysticercosis and to advocate for hygienic practices and meticulous food handling techniques to diminish transmission risks.
- Treatment of tapeworm carriers: Administration of anthelminthic therapy to individuals harboring the adult tapeworm, thereby thwarting the dissemination of parasite eggs into the environment and reducing the likelihood of transmission to others.
- Enhanced animal husbandry practices: Implementation of stringent measures to prevent porcine exposure to human excrement and subsequent tapeworm infection, thereby interrupting the parasite's life cycle.

Case report

A 22-year-old male who was a daily wage worker at a construction site had a history of sudden onset tonic-clonic movement of bilateral upper and lower limbs associated with clenching of teeth and frothing from the mouth. He was presented to the Emergency Department with status epilepticus. The patient was intubated outside the hospital i/v/o airway protection, given his low Glasgow Coma Scale (GCS), but the patient was still undergoing active convulsions. He had already received intravenous

anticonvulsants and an injection of Lorazepam 2mg intravenously before arriving at the hospital. Upon assessment, he was administered repeat dosages of anticonvulsants (injection Levetiracetam 2gm) and benzodiazepine (injection Lorazepam 2mg intravenously) after which the convulsion resolved. Arterial Blood Gas analysis (ABG) was performed, revealing severe High Anion Gap Metabolic Acidosis (HAGMA), elevated lactate levels, and increased creatinine. A Computed Tomography (CT) scan revealed the presence of multiple ring-enhancing lesions in the brain. Subsequently, a High-resolution CT (HRCT) scan of the thorax was conducted, and indicated signs consistent with aspiration. Additionally, the abdominal cut of the CT scan showed evidence of hydronephrosis, so a full abdominal CT was performed, which showed bilateral obstructive uropathy. Additionally, multiple cystic lesions were observed in the psoas muscle and the rectus abdominus muscle. The patient required four cycles of dialysis and bilateral DJ stent placement for the obstructive uropathy. On the fifth day of admission, the patient was successfully extubated. He was discharged with antiepileptic medication, Tab leviteracitam 500mg twice daily, and Tab albendazole 500mg twice daily, with a scheduled follow-up with the neurology department after 15 days after which the antihelmenthic was stopped, and Tab Leviteracitam 500mg was continued until next follow-up which was after six months.

On further inquiring, it was found that the patient was employed as a daily wage worker and lives in conditions lacking proper sanitation, increasing susceptibility to neurocysticercosis infection.

Management

The management of this patient involved a multispecialty approach due to the complexity of neurocysticercosis, metabolic acidosis and obstructive uropathy. Immediate interventions included intubation outside the hospital to ensure airway protection and administration of intravenous anticonvulsants (injection Levetiracetam 2gm) and benzodiazepines (injection Lorazepam 2mg) after which the seizures stopped) The patient's severe metabolic acidosis and elevated lactate levels required initial medical management (inj. Sodium Bicarbonate 200ml) followed by hemodialysis. Radiological evaluation with a CT scan revealed multiple ring-enhancing lesions in the brain and cystic lesions in the psoas muscle. Bilateral kidney involvement was also noted, requiring bilateral double-J stent placement. After five days of hospitalization, the patient's condition improved, and he was extubated. He was discharged on a regimen of antiepileptic and anti-helminthic medications with plans for neurology follow-up to manage his neurocysticercosis and epilepsy.

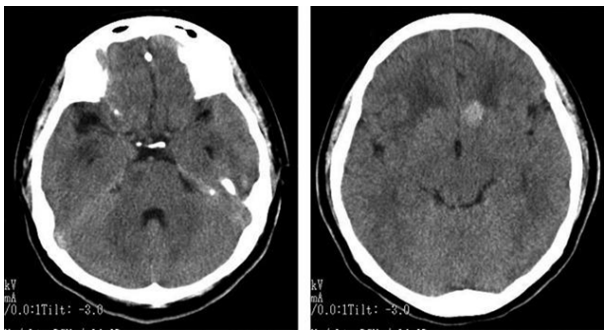
Discussion

Neurocysticercosis remains a significant public health concern, particularly in regions marked by poor sanitation practices, such as India[6,7]. This case report sheds light on an uncommon manifestation of neurocysticercosis leading to obstructive uropathy, a rarely documented complication[8]. The intricate nature of this case underscores the necessity for a comprehensive understanding of neurocysticercosis and its potential complexities.

The patient's presentation with status epilepticus underscored the acute and severe neurological manifestations associated with neurocysticercosis, necessitating urgent intervention[9]. The subsequent diagnosis of obstructive uropathy, though unusual, highlights the importance of considering atypical presentations of neurocysticercosis, especially in endemic regions[10].

A collaborative approach involving specialists from neurology, nephrology, and radiology was pivotal in addressing the multifaceted clinical challenges posed by this case[11]. This interdisciplinary approach facilitated thorough evaluation and tailored management strategies, leading to the successful resolution of the patient's neurological symptoms and urological obstruction[12].

Furthermore, this case underscores the significance of differential diagnosis in evaluating patients with suspected neurocysticercosis. Conditions such as brain tuberculoma, primary brain tumors, multiple sclerosis, toxoplasmosis, and echinococcosis present diagnostic challenges and require careful clinical and radiological assessment for accurate diagnosis and optimal management. Enhanced awareness among healthcare providers regarding the diverse clinical presentations of neurocysticercosis is essential for timely recognition and appropriate intervention. Additionally, public health initiatives aimed at improving sanitation practices and increasing disease awareness can contribute significantly to reducing the burden of neurocysticercosis in endemic regions[12,13].



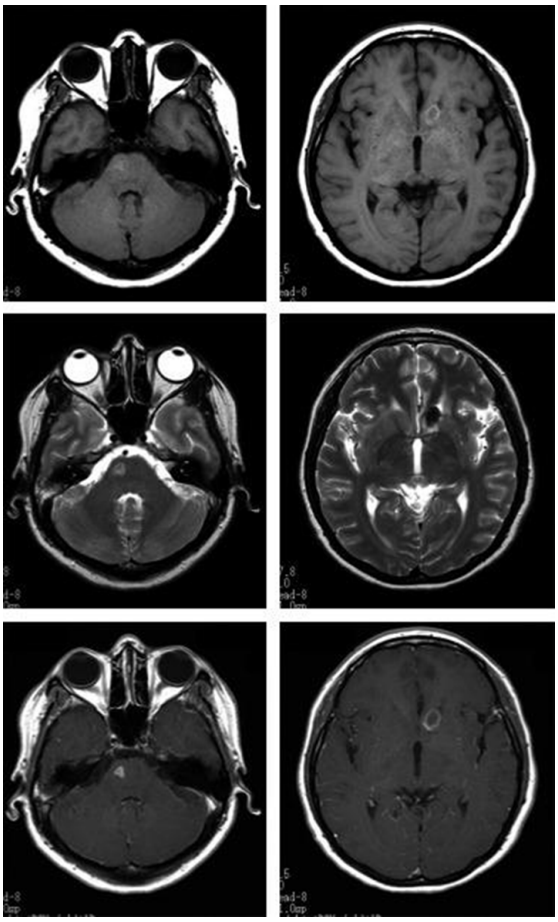


Figure 1: CT scan of the brain showing multiple ring-enhancing lesions, a hallmark of neurocysticercosis. *The MRI shows multiple cystic lesions with ring enhancement, consistent with neurocysticercosis, indicating active inflammation around cysticerci in the brain.*

Differential diagnosis

Brain Tuberculoma: Tuberculosis can present as brain tuberculomas, mimicking neurocysticercosis on imaging. Both conditions may manifest as ring-enhancing lesions in the brain, leading to diagnostic challenges.

Primary Brain Tumor (e.g., Glioblastoma Multiforme): Malignant brain tumors, particularly glioblastoma multiforme, can have radiological similarities with neurocysticercosis. Both may appear as enhancing lesions on imaging.

Multiple Sclerosis (MS): In some cases, multiple sclerosis can present with white matter lesions that may be mistaken for cysticercosis on imaging. Clinical and imaging findings help differentiate these conditions.

Toxoplasmosis: Toxoplasmosis, caused by the parasite *Toxoplasma gondii*, can result in brain lesions like those seen in neurocysticercosis. Serological tests and imaging characteristics aid in distinguishing between the two.

Echinococcosis (Hydatid Disease): Cystic echinococcosis, caused by the tapeworm *Echinococcus granuloses*, can form cystic lesions in various organs, including the brain. Radiological features and serological testing help differentiate it from neurocysticercosis.

Conclusion

In conclusion, this case highlights the potential complexities and diagnostic intricacies associated with neurocysticercosis, emphasizing the importance of a collaborative, multidisciplinary approach in management and the need for heightened vigilance in identifying atypical presentations.

Conflict of Interest: Nil

Source of Support: Nil

ORCiD

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Ethical Consideration

Informed consent was obtained from the patient. The identity of the patient has not been disclosed in the case study.

Data Availability Statement

Data will be available with the author on request.

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