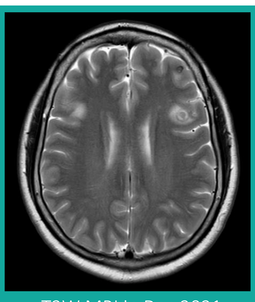
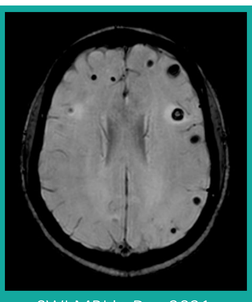
MISDIAGNOSIS AS NEUROCYSTICERCOSIS: A CASE REPORT

POON Sze Wang; HUI Ka Ho; CHAN Tat Ming
Division of Neurosurgery, Department of Surgery, Prince of Wales Hospital, The Chinese University of Hong Kong.



T2W MRI in Dec 2021



SWI MRI in Dec 2021

CASE PRESENTATION

- 55-year-old female
- presented with recurrent vomiting in Dec 2021

- CT brain: multiple hyperdense lesions in cerebral hemispheres, brainstem and cerebellum
  FDG PET-CT: not suggestive of malignancy
- MRI: concurrent haemorrhagic and calcified lesions with eccentric enhancing dots suspicious of scolex

- Provisional diagnosis: neurocysticercosis

INITIAL TREATMENT

The patient received a treatment regimen consisting of dexamethasone, albendazole, and praziquantel. Her symptoms improved.

Due to the lack of a significant radiological response, she received two additional courses of antiparasitic treatment over a year.

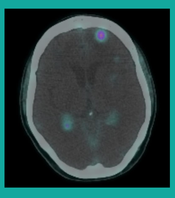
FURTHER WORKUP

- Exposure to *Taenia solium*: no significant history
- Ophthalmologist's examination: no ocular cysticercosis
- Skeletal survey: no identified cysticerci
- Repeated *Taenia solium* IgG: negative
- Repeated CT, PET-CT and MRI: similar findings

18 MONTHS FROM PRESENTATION

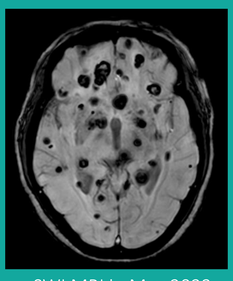
She was readmitted for vomiting. CT showed interval increase in the size of the left cerebellar lesion and mild hydrocephalus.

A suboccipital craniotomy was performed for excision of the cerebellar lesion , and histological examination confirmed the presence of a grade 3 neuroendocrine tumour

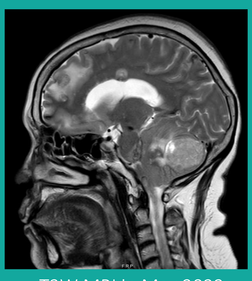


LATEST UPDATE

Subsequent DOTATATE PET-CT revealed multiple avid nodules throughout the brain, consistent with multifocal neuroendocrine tumours. However, the primary site of the tumour could not be identified. The patient was referred to oncology service and is currently undergoing systemic treatment.



SWI MRI in May 2023



T2W MRI in May 2023

DISCUSSION

Neurocysticercosis is a form of infection caused by the pork tapeworm, *Taenia solium*, which leads to the formation of cysts in the central nervous system. The disease presents with various manifestations, including seizures, intracranial hypertension, hydrocephalus, chronic meningitis, and focal neurological deficits, with greatly variable symptoms. In developed areas, the diagnosis is typically made using CT, MRI, and serology tests.

In the Revised Diagnostic Criteria for Neurocysticercosis proposed by Del Brutto et al. in 2017, our index case did not meet the required absolute or clinical/exposure criteria, although two major and one minor neuroimaging criteria were fulfilled (underlined in *Table 1*).[1] Based on the algorithm, this means that neither a definitive nor a probable diagnosis could be established, even if the confirmatory neuroimaging criteria were met subsequently. *(Table 2)*

The disease progression was monitored by serial MRI in accordance with guidelines by the IDSA and ASTMH.[2] They recommended repeated MRI assessment at least every 6 months until resolution of the cystic component.[2] However, despite these efforts, the confirmatory neuroimaging criteria remained unfulfilled.

In conclusion, the radiological finding of multiple cystic brain lesions can pose diagnostic challenges. When there is uncertainty surrounding the diagnosis of neurocysticercosis, it is essential to promptly review and reassess the diagnostic approach. Despite initial indications, the diagnosis may remain inconclusive. In such cases, considering a histological diagnosis becomes crucial. By incorporating histopathological evaluation, we can enhance patient care and improve outcomes in cases involving diagnostic doubt for multiple cystic brain lesions.

Table 1. Diagnostic criteria of neurocysticercosis

Absolute Criteria
- Histological demonstration of the parasite from biopsy of a brain or spinal cord lesion
- Direct visualization of subretinal cysticercus
- Conclusive demonstration of a scolex within a cystic lesion on neuroimaging studies

Major Neuroimaging Criteria
- Cystic lesions without a discernible scolex
- Enhancing lesions
- Multilobulated cystic lesions in the subarachnoid spaces
- Typical parenchymal brain calcifications

Confirmatory Neuroimaging Criteria
- Resolution of cystic lesions after cysticidal drug therapy
- Spontaneous resolution of single small enhanced lesions
- Migration of ventricular cysts documented on sequential neuroimaging studies

Minor Neuroimaging Criteria
- Obstructive hydrocephalus (symmetric or asymmetric) or abnormal enhancement of basal leptomeninges

Major Clinical/Exposure Criteria
- Detection of specific anti cysticercal antibodies or cysticercal antigens by well-standardized immunodiagnostic tests
- Cysticercosis outside the central nervous system
- Evidence of a household contact with *T. solium* infection

Minor Clinical/Exposure Criteria
- Clinical manifestations suggestive of neurocysticercosis
- Individuals coming from or living in an area where cysticercosis is endemic

Table 2. Diagnostic algorithm of neurocysticercosis

definitive diagnosis	one absolute criterion
or	two major neuroimaging criteria + any clinical/exposure criteria
or	one major and one confirmative neuroimaging criteria + any clinical/exposure criteria
or	one major neuroimaging criterion + two clinical/exposure criteria (at least one major) + exclusion of other pathologies producing similar neuroimaging findings
probable diagnosis	one major neuroimaging criterion + any two clinical/exposure criteria
or	one minor neuroimaging criterion + at least one major clinical/exposure criterion

References
1. Del Brutto OH, Nash TE, White AC, Rajshekhar V, Wilkins PP, Singh G, et al. Revised diagnostic criteria for neurocysticercosis. Journal of the Neurological Sciences. 2017;372:202–10. doi:10.1016/j.jns.2016.11.045
2. White AC, Coyle CM, Rajshekhar V, Singh G, Hauser WA, Mohanty A, et al. Diagnosis and treatment of neurocysticercosis: 2017 clinical practice guidelines by the Infectious Diseases Society of America (IDSA) and the American Society of Tropical Medicine and Hygiene (ASTMH). Clinical Infectious Diseases. 2018;66(8). doi:10.1093/cid/cix1084