Intracerebral neurocysticercosis mimicking glioblastoma multiforme: a rare differential diagnosis in Central Europe

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M. Sabel (✉) · F. Weber
Department of Neurosurgery,
Heinrich-Heine University Düsseldorf,
Moorenstrasse 5, 40225 Düsseldorf,
Germany
e-mail: Sabel@uni-duesseldorf.de
Tel.: + 49-211-8117937
Fax: + 49-211-8117919

E. Neuen-Jacob
Department of Neuropathology,
Heinrich-Heine University Düsseldorf,
Moorenstrasse 5, 40225 Düsseldorf,
Germany

C. Vogt
Department of Internal Medicine,
Heinrich-Heine University Düsseldorf,
Moorenstrasse 5, 40225 Düsseldorf,
Germany

Abstract A 47-year-old Greek man presented with a 4-week history of speech difficulties. CT and MRI revealed a low-density multilobulated cystic frontal mass with peripheral ring contrast enhancement adjacent to the sylvian fissure. Examination was normal. Blood tests revealed leucocytosis (16,000 cells/μl) and an elevated erythrocyte sedimentation rate (30/52). A malignant brain tumour was suspected and surgically removed. Histological examination disclosed intracerebral neurocysticercosis.

Key words Taenia solium · Glioma

Introduction Neurocysticercosis (NCC) is a parasitosis with common involvement of the central nervous system (CNS) [1, 2] and variable geographical distribution. The incidence is high in Mexico (3% of necropsies [2]), South America and India and somewhat lower in Portugal, Spain and Eastern European countries [1]. NCC is uncommon in Central Europe, mainly occurring in individuals who have who been to the tropics [3, 4, 5]. It may mimic a malignant brain or spinal tumour [6, 7, 8]. We draw attention to the possibility of encountering this very uncommon disease in Central Europe, since increased world travel and immigration have spread the disease widely.

Case report A 47-year-old, right handed Greek man presented with a 4 week history of speech difficulties, problems with calculation and alexia. He had been living in Germany for 20 years, traveling occasionally to Greece. He had not been to endemic areas of NCC. On admission the patient was awake, with diminished concentration and a mildly impaired ability to read. Cranial nerves were normal, no motor or sensory deficit was elicited. The ankle jerks were absent. Blood tests revealed leucocytosis (16,000 cells/μl), an elevated erythrocyte sedimentation rate (30/52) and normal C-reactive protein. Cranial CT demonstrated a low-density, multilobulated cystic mass with peripheral ring enhancement in the left frontal lobe adjacent to the sylvian fissure (Fig.1a–d). Small calcified lesions were detected close to the cyst and in the right occipital and frontal lobes (Fig.1a, b). On MRI the mass gave low signal on T1- (Fig.1c) and high sig-
nal on T2-weighted images. FLAIR images showed mild perifocal oedema (Fig. 11).

A malignant brain tumour was suspected. During surgery multiple cystic structures were identified within the brain, some tightly adherent to branches of the left middle cerebral artery. Microsurgical resection was performed. Frozen sections disclosed a parasitic cyst consisting of three distinct layers (Fig. 2): a thin outer cuticular, a middle cellular and an inner reticular layer containing small foci of calcification. The diagnosis of NCC was confirmed by paraffin sections. Marked inflammatory infiltrates, foreign-body giant cells, calcification, areas of necrosis and cholesterol clearly indicated tissue reaction following the death of the larvac. Parts of the parasite were completely necrotic (Fig. 2). Western blot studies confirmed the presence of cysticerus antibodies in the cerebrospinal fluid and serum. The patient was started on albendazole. An extensive search for systemic cysticerci was negative. The patient recovered well and was discharged without any neurological deficit.

Discussion

Human cysticercosis arises when man serves as an incidental intermediate host to *Taenia solium*, the pork tapeworm. Neurocysticercosis, the affection of the CNS by *Taenia solium* larvae (cysticerci) is the most frequent and widespread human neuroparasitosis.

Imaging is crucial in diagnosis [7]. Six forms of NCC have been recognised, depending on the location: parenchymal, arachnoidal, ventricular, intrasellar, spinal and mixed. Our patient had parenchymal and arachnoid disease. Parenchymal cysticerci undergo various stages of degeneration, corresponding to defined stages on MRT or CT. CT in this case demonstrated a large, lobulated cystic mass with strong peripheral contrast enhancement. Furthermore multiple, small calcified lesions were seen, corresponding with the calcified stage (Fig. 1). On T1-weighted images the mass gave low signal (Fig. 1c). FLAIR images revealed perilesional oedema (Fig. 11). These appearances are consistent with the colloidal stage, which may mimic intracerebral abscess or glioma [6, 7, 9].

CSF studies contribute to diagnosis. Pleocytosis is mainly lymphocytic, and in about half of cases eosinophils are found in the sediment. Immunodiagnosis has recently improved, but cross-reactions with other helminths present a serious problem. Using enzyme-linked immunosorbent assay (ELISA), sensitivity and specific-