

FULMINANT FORM OF MULTIPLE SCLEROSIS SIMULATING BRAIN TUMOR

A CASE WITH PARKINSONIAN FEATURES AND PATHOLOGIC STUDY

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SUMMARY - We describe the case of a 48 year- old man in whom the clinical features, CT and MR scans were suggestive of a brain tumor but, posteriorly, another MRI study, CSF examination and brain biopsy supported the diagnosis of multiple sclerosis. Interestingly, this patient presented parkinsonian features, probably in connection with the underlying disease.

KEY WORDS: multiple sclerosis, tumoral form, parkinsonism.

Forma fulminante de esclerose múltipla simulando tumor cerebral: um caso com sinais parkinsonianos e estudo patológico

RESUMO - Os autores descrevem o caso de um paciente com 48 anos de idade cujos sinais e sintomas, TC e RM foram sugestivos de tumor cerebral mas, posteriormente, nova RM, estudo do LCR e biopsia cerebral sustentaram o diagnóstico de esclerose múltipla. Curiosamente, no transcurso da enfermidade este paciente apresentou parkinsonismo, provavelmente relacionado com a doença de base.

PALAVRAS-CHAVE: esclerose múltipla, forma tumoral, parkinsonismo.

The diagnosis of multiple sclerosis (MS) is based on clinical grounds as no laboratory finding is pathognomonic¹⁵. Malignant course may occur in 10% to 15%¹⁹, and a hyperacute form may affect 8% of the patients²⁴. Large plaque in the brain with surrounding edema and mass effect simulating a cerebral tumor is rare. When this occurs without other signs or symptoms, it often represents a diagnostic challenge. Even with the aid of cerebrospinal fluid (CSF) examination, CT scan and MRI diagnosis of MS is not possible, without pathologic studies in such cases. The primary central nervous system (CNS) lymphoma that usually presents as a periventricular mass lesion may simulate MS in some aspects⁵. Parkinsonian features secondary to MS are very uncommon. It has been estimated that MS and Parkinson disease may co-exist in 1 individual per 500000²².

The authors report the case of a patient with the tumoral form of MS and parkinsonian features. To the best of our knowledge, this association has hardly been reported in the current literature.

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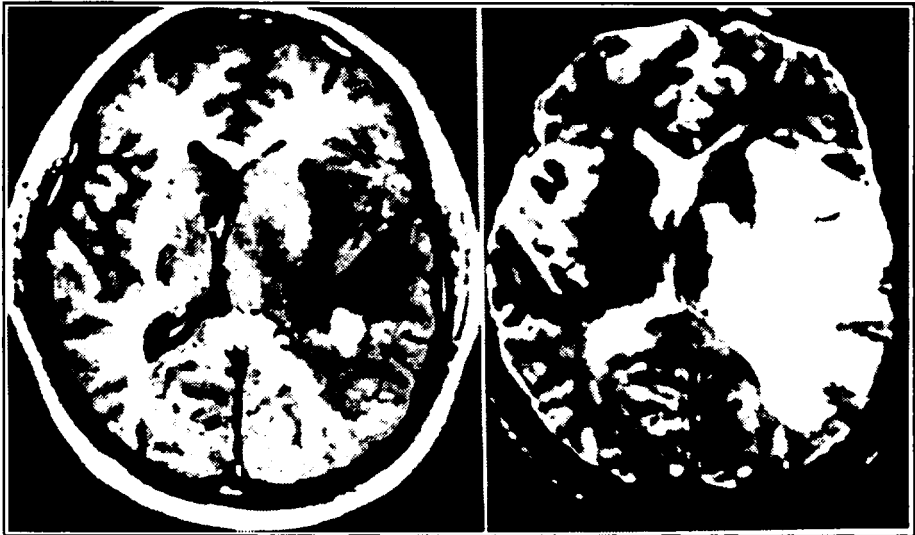


Fig 1 (a, left; b, right). Axial MRI scan sequence showing - (a) T1- weighted after the administration of gadolinium: hypointensity in the left temporo-parieto-occipital region with mass effect and enhancement in the centre of the lesion. (b) T2-weighted: extensive increased signal intensity and mass effect in the same region.

CASE REPORT

ICPR, a 48 year-old right-handed white man presented with a 3-week history of a left fronto-parietal, occasionally generalized, daily headache that had been initially attributed to emotional stress. The pain was moderate to intense, constrictive, and was usually worse after mild physical effort. It was eventually followed by vomiting. Forgetfulness, speech difficulty and progressive right hemiparesis were observed. His medical history was unremarkable. The neurologic examination revealed a slight right hemiparesis mostly in the face and arm, with hyperactive reflexes, and no sensory abnormalities. The plantar responses were flexor. There were dysarthria, nonfluent dysphasia and mild bilateral papilledema. A CT scan revealed a contrast-enhancing left temporo-parieto-occipital white-matter lesion with marked surrounding edema and mass effect. A MRI taken a week later showed the same lesion, which was considered as a possible tumor (Fig 1). The patient was put on dexamethasone 16mg/day and analgesics. The chest X-ray and the abdomen ultra-sound examination were normal. Surprisingly, three weeks later a CT scan performed with double contrast, immediately and one hour later, taken just prior to a needle biopsy showed only a slight hypodensity without contrast enhancing where the lesion was previously seen. Therefore the biopsy was not performed. A control MRI taken two weeks later showed an almost complete regression of the "tumoral lesion", but additional white-matter lesions became evident (Fig 2). A lumbar puncture disclosed an opening pressure of 190 mm H₂O, and CSF had 11 nucleated cells (63% lymphocytes), glucose 68 mg/dL, total protein 34 mg/dL, gamma globulin increase (26.8%; N 7.0-14) with oligoclonal bands, and IgG increase (9.5 mg/dL; N<3.6). An anti-HIV test was negative. The symptoms gradually resolved, except for a very mild right facial weakness, and he felt good for one- and-a- half month. At that time, a progressive and rapid deterioration occurred, with mental confusion, impaired memory and parkinsonian features. He required assistance to walk pulled by his arms with a very slow broad-based and short-stepped gait. He had generalized hypokinesia with bilateral cogwheel rigidity in the arms, resting tremor, masked face and whispering speech. The tremor and rigidity were more marked on the left arm. Within one week he became lethargic with bowel and bladder incontinence and soon he was unresponsive to any stimuli. The breathing was markedly distressful. A significant enlargement of the lesions in both cerebral hemispheres and a new one in the right cerebral peduncle were evident in a follow-up MRI (Fig 3). A needle biopsy of one right frontal lesion was performed and showed, in sections stained with hematoxylin-eosin, reactive astrocytes with hypertrophied cell bodies some of them with stellate appearance (Fig 4). The luxol fast blue staining for myelin was negative and the Bielschowsky staining for neurofilaments was positive. There was no inflammatory

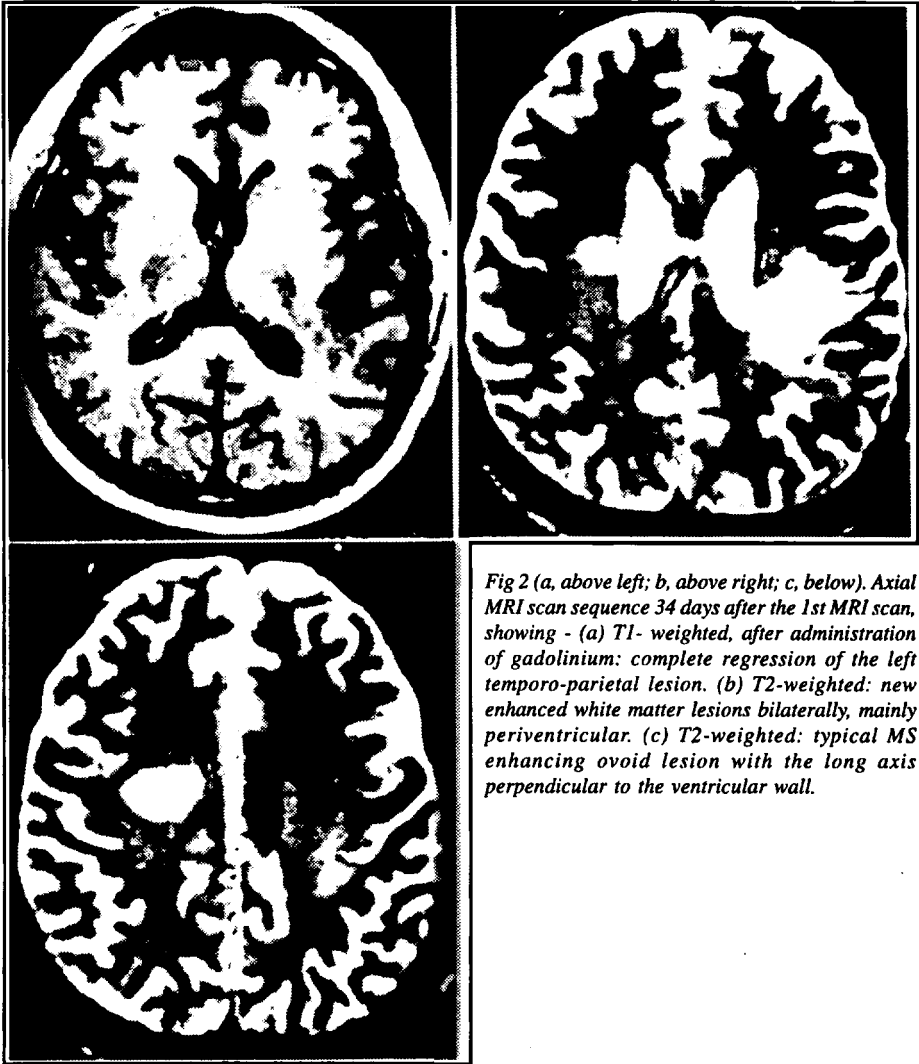


Fig 2 (a, above left; b, above right; c, below). Axial MRI scan sequence 34 days after the 1st MRI scan, showing - (a) T1- weighted, after administration of gadolinium: complete regression of the left temporo-parietal lesion. (b) T2-weighted: new enhanced white matter lesions bilaterally, mainly periventricular. (c) T2-weighted: typical MS enhancing ovoid lesion with the long axis perpendicular to the ventricular wall.

infiltration. In spite of the high-doses intravenously administered methylprednisolone and plasmapheresis, the patient's condition worsed to a vegetative state, and he died five months after the onset of his illness. An autopsy was unfortunately not obtained.

COMMENTS

The tumoral form of MS is rare³. Hunter et al.⁹, in approximately 1220 brain biopsies, observed only four cases of a demyelinating disease suggesting a primary brain tumor. Nesbit et al.¹² retrospectively reviewed the cases of 40 patients with biopsy or autopsy-proved inflammatory demyelination consistent with MS, and in only one there was moderate edema and severe mass effect. In cases with a single demonstrated lesion, the diagnosis may be impossible during the initial episode, even with the aid of CT scan and MRI. The accuracy diagnosis of supratentorial solitary brain lesion with CT scan is relatively low. The predicted diagnosis agreed with the definite diagnosis

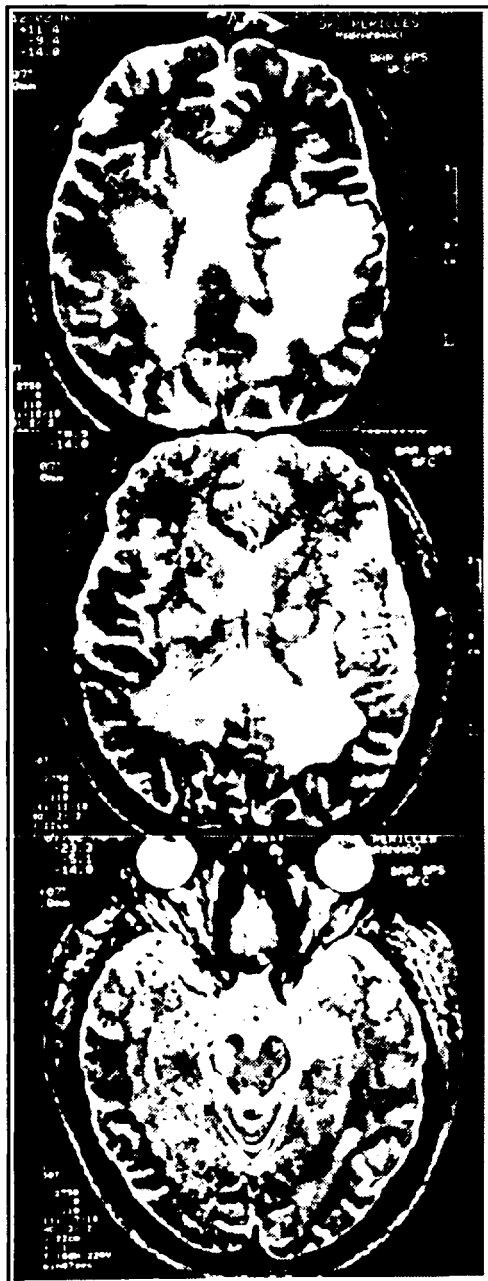


Fig 3 (a, above; b, middle; c, below). Axial T2-weighted MRI scan sequence one-and-a-half month after the 2nd MRI scan, showing - (a) Large areas of high signal intensity in the cerebral periventricular white matter bilaterally, without mass effect. (b) The hyperintense lesions involve the posterior limb of the internal capsule, thalamus and globus pallidus, more marked on the left. (c) Hyperintense signal intensity in the right cerebral peduncle.

is only 57%⁸. Aphasia and headache did not correlate with any clinical feature of MS except when a large MS plaque causes inflammation and cerebral edema, simulating a diagnosis of brain tumor^{6,18,20}. The presence of edema peripheral to the enhancement and marked mass effect are unusual in patients with MS^{12,14}. The lack of mass effect has been considered to differentiate the MS plaque from space occupying lesions, but this and other reports show that it may be incorrect^{1,2,6,7,17,20,23}.

Enhancement CT lesions appear to be particularly associated with acute disease^{12,20,23}, and is considered to represent a local breakdown of the blood-brain barrier accompanying active demyelination¹³. It is well-known that MRI detects demyelinating lesions, even when CT scans fail to demonstrate them^{7,25}. MRI, is the most sensitive imaging method for detection of demyelinating plaques within the cerebral white matter^{12,14,23,25}. The radiological differential diagnosis of this MS form include abscesses, vascular lesions and tumors^{6,10,17,23}. Primary CNS lymphoma, the so-called "ghost tumor"²¹, may be mistaken as MS. The lesion(s) usually present as a periventricular mass that densely and diffusely enhances, after the administration of intravenous contrast for CT scan or MR images in more than 90% of the patients. The lesion has an unique sensitivity to corticosteroids: at least in 40% of the patients the lesion shrinks or temporarily disappears after steroid administration^{5,21}.

In the present case, the history, the CT-scan and the MRI were suggestive of tumor but another MRI, showing concomitant lesions in other areas, and the CSF oligoclonal bands allowed the diagnosis of laboratory-supported definite MS¹⁶. However, even with other MS lesions, a concomitant tumor cannot always be excluded^{4,11}.

The nonneoplastic demyelinating process with relatively spared axons associated with multifocal lesions in radiologic studies and CSF oligoclonal IgG banding are highly suggestive of MS. Although disclosing some predilection for white matter and periventricular regions, the plaques of MS may be found in any area of the CNS⁹. The lesions are usually multifocal, but

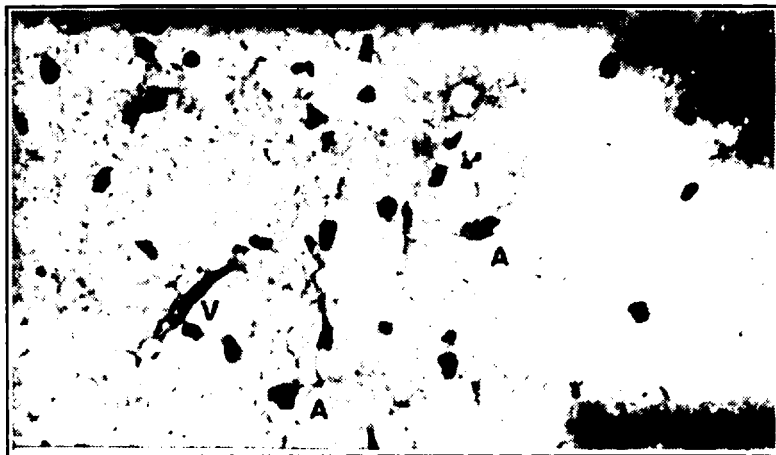


Fig 4. Reactive astrocyte (A) in a demyelination area. Vessel without inflammatory reaction (V). Hematoxylin-eosin; x10; optic microscopy.

may be single or diffuse. Selective destruction of myelin sheaths is not a feature of either a primary brain tumor or cerebral infarction. Although gliomas often infiltrate nerve fibers, myelin stains in this situation readily demonstrate intact myelin sheaths. Despite of these findings, we have found no specific diagnostic criteria for the less common mass-like presentation of MS⁶.

Another interesting aspect in the present case was the parkinsonian picture. This patient had no other causes of parkinsonism than MS. There was involvement of the thalamus and basal ganglia bilaterally and the right cerebral peduncle. Structural lesions such as demyelinating plaques affecting the basal ganglia or thalamus in the basal ganglia - thalamo - cortical pathways level may lead to a parkinsonian state²². Although this is a rare association, we consider that there might have been a pathophysiological relationship between the two conditions, more than a simple coincidence.

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