AUGUST 2007 CASE 2

A 40-YEAR-OLD WOMAN WITH A PROGRESSIVE PERIVENTRICULAR WHITE MATTER LESION

CLINICAL HISTORY

A 40-year-old woman presented with blurred vision and diplopia, followed by slowly progressive left-sided motor and sensory disturbances. She also suffered from memory loss and mild spatial and temporal disorientation. A T2-weighted MRI (Figure 1A) showed a large area of high signal intensity (indicated by arrows) in the periventricular white matter of the right more than the left occipital region and the corpus callosum, without enhancement on T1-weighted images (Figure 1B), There was no mass effect. A tumor was considered unlikely, and acute demyelinating encephalomyelopathy was suspected. Repeated cerebrospinal fluid (CSF) examinations showed a mononuclear pleocytosis (10 cells per cubic mm, normal value: <3 cells), without immunohistochemical evidence of tumor cells; tumor markers HCG, AFP and CEA were not elevated. Flow cytometry showed predominantly reactive T-lymphocytes, but again no evidence of tumor cells. CT scan of thorax and abdomen did not reveal any abnormalities. The CSF-serum IgG index was normal, and oligoclonal bands were absent. No evidence of a vasculitis or an inflammatory disease was found. Treatment with steroids proved ineffective.

MICROSCOPIC DESCRIPTION

A stereotactic biopsy of the intracerebral lesion showed blast-like neoplastic cells within a mononuclear infiltrate (Figure 2A). The rounded tumor cells contained large centrally located nuclei. A wide panel of markers including those for carcinoma, melanoma and primary central nervous system lymphoma was applied: CD3, CD4, CD5, ALK-1, CD19, CD20, CD79a, CD45, CD30, S-100, MELAN-A, HMB45, CD68, CD43, placental alkaline phosphatase (PLAP), hCG, AFP and CD56, all found to be negative; there was some punctuated NCL5D3 (low molecular weight keratins 8 and 18) positivity (Figure 2B). No final diagnosis could be made.

Subsequently, the marker OCT3/4 became available, which has proven to be specific for certain histological types of germ cell tumors (6), including seminomatous tumors and embryonal carcinoma. This has been confirmed in multiple independent studies (1) (for review). One hundred per cent of tumor cell nuclei present in the biopsy of the above-mentioned patient clearly stained positive for OCT3/4 (Figure 2C). Because only a small number of tumor cells were present in this slide and no biopsy material was left anymore, OCT3/4 was also applied to a slide previously found to be negative by immunohistochemistry for another unrelated marker. Again all tumor nuclei stained positive for OCT3/4 without any background. The stem cell factor receptor c-KIT was also applied to a previously negative slide and the cytoplasm of some tumor cells was stained positive (Figure 2D).

DIAGNOSIS and DISCUSSION for this case can be found on page 142.

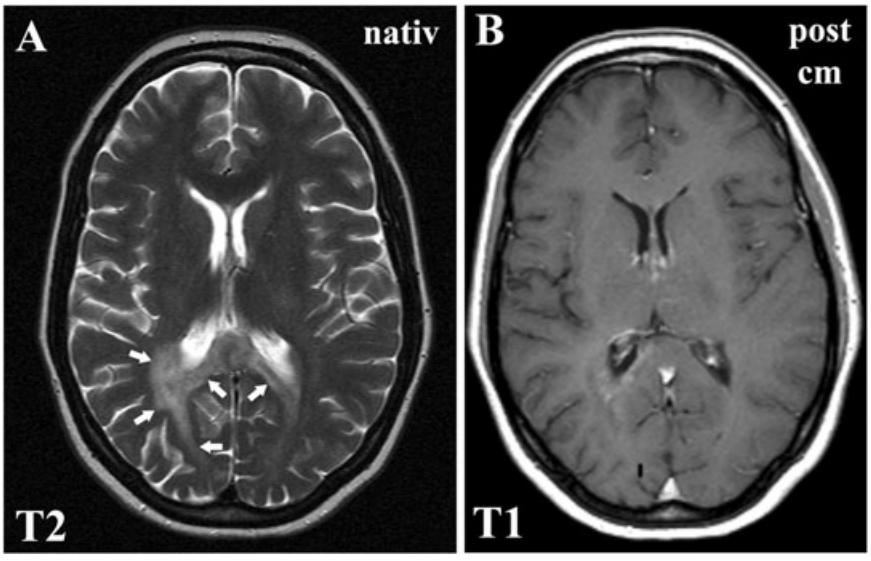

Figure 1.

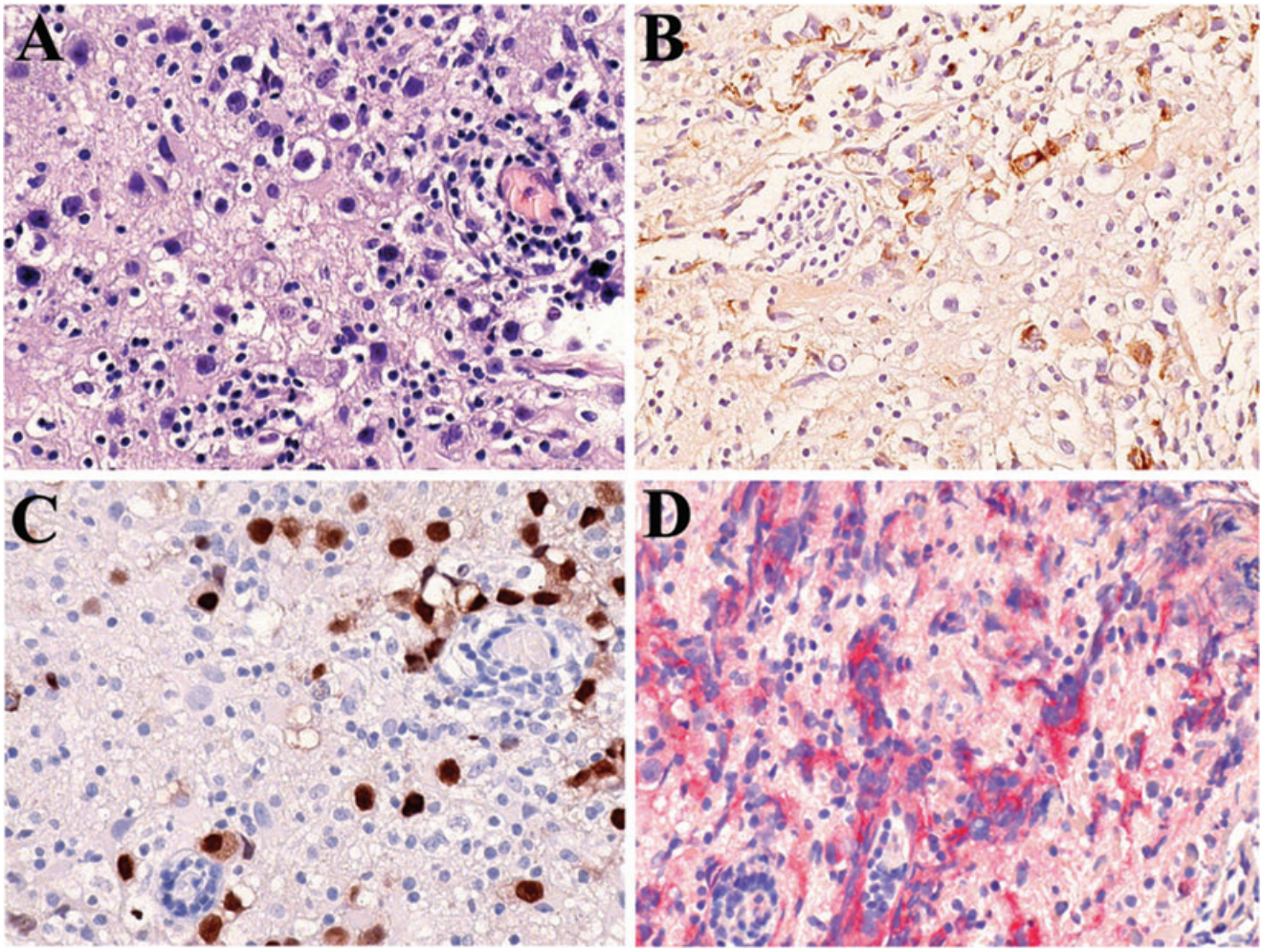

Figure 2.

Brain Pathology **18** (2008) 103–104