The “pulvinar sign” in a case of paraneoplastic limbic encephalitis associated with non-Hodgkin’s lymphoma

M Mihara, S Sugase, K Konaka, F Sugai, T Sato, Y Yamamoto, S Hirotu, K Sakai, S Sakoda


SHORT REPORT

This paper reports a 59 year old woman with paraneoplastic limbic encephalitis associated with diffuse large B cell lymphoma. Her brain magnetic resonance imaging scan showed bilateral posterior thalamic hyperintensities, similar to the “pulvinar sign”. Her symptoms included progressive psychiatric disturbance and resembled the initial symptoms of variant Creutzfeldt–Jakob disease (vCJD). Clinicians should consider this treatable disorder in the differential diagnosis of vCJD.

Paraneoplastic neurological syndromes (PNS) are disturbances of the nervous system that are associated with cancer but are not caused by the tumor growth itself or by non-metastatic complications such as secondary infections and metabolic, ischaemic or nutritional disorders. Paraneoplastic limbic encephalitis (PLE) is a subtype of PNS, characterised by personality changes, irritability, depression, seizures, memory loss and dementia. The most frequent magnetic resonance imaging (MRI) abnormalities in PLE are hyperintensity signals on T2-weighted or fluid attenuation inversion recovery (FLAIR) images involving one or both medial temporal lobes. Thalamic involvement has rarely been described. In this paper, we report the first case of PLE associated with non-Hodgkin’s lymphoma showing bilateral hyperintensity signals in the posterior thalamus—known as the “pulvinar sign”.

CASE REPORT

The patient was a 59 year old woman, who worked as a medical clerk. Her medical history was unremarkable except for a hysteromyoma. In October 2003, she noticed that she had lost 10 kg over a period of two months. She consulted a medical clerk. Her medical history was unremarkable except for a hysteromyoma. In October 2003, she noticed that she had lost 10 kg over a period of two months. She consulted a medical clerk.

Repeated brain MRI revealed high intensity signals in the left hippocampi in addition to bilateral posterior thalamius (fig 1B, C). A computed tomography (CT) scan of the chest revealed an enlarged left axillary lymph node. In addition, gallium citrate uptake was evident in the left axillary lymph node (fig 1D), which was dissected. Pathological examination revealed diffuse large B cell lymphoma (fig 1E–G).

Table 1 Neuropsychological examination results of the patient

<table>
<thead>
<tr>
<th>Test battery (normal)</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini Mental State Examination (&gt;23)</td>
<td>24/30</td>
</tr>
<tr>
<td>Digit span (F &gt; 5 B &gt; 3)</td>
<td>Forward: F 6; backward: B 4</td>
</tr>
<tr>
<td>Frontal Assessment Battery (&gt;16)</td>
<td>13/1</td>
</tr>
<tr>
<td>Wechsler Adult Intelligence Scale-Revised (&gt;80)</td>
<td>VIQ 83; PIQ 89; IQ 86</td>
</tr>
<tr>
<td>Wisconsin Card Sorting Test (CA &gt; 4.2 FE &lt; 4.0)</td>
<td>Achieved categories: CA 1</td>
</tr>
<tr>
<td>Verbal fluency (letter &gt; 7.6 category &gt; 13.6)</td>
<td>Category 5.3/minute</td>
</tr>
</tbody>
</table>

Abbreviations: CSF, cerebrospinal fluid; MRI, magnetic resonance imaging; PLE, paraneoplastic limbic encephalitis; vCJD, variant Creutzfeldt–Jakob disease.

ataxia were not evident. Routine blood and chemistry tests including C reactive protein, vitamin B12, and vitamin B12 were normal. Serum virus screening test was negative for human immunodeficiency virus, human T lymphotrophic virus I, herpes simplex and varicella zoster viruses, cytomegalovirus, Epstein–Barr virus, measles, hepatitis B and hepatitis C virus. Serum screening for syphilis was also negative. Thyroid functions were within the normal range. Antinuclear antibody was weakly positive (×40), but other autoantibodies were negative. Immune electrophoresis was also normal. Neurone specific enolase was slightly elevated in the serum (13.7 ng/ml), but other tumour markers including carcinoembryonic antigen, CA 19-9, CA 15-3, pro-gastrin releasing peptide and soluble interleukin-2 receptors were within the normal range. Cerebrospinal fluid (CSF) examination showed normal cell counts (4 lymphocytes/μl) without abnormal cells and elevated total protein (56 mg/dl) and IgG index (1.39). CSF oligoclonal bands were positive and 14-3-3 protein was negative. Serum and CSF screening for antineuronal antibodies were negative including anti-Hu, anti-Yo, anti-Ri, anti-Ta, anti-Ma, anti-amphiphysin and CRMP-5. Electroencephalography revealed normal background activity with bilateral sporadic frontal spikes. Moreover, spike and wave activities, induced by photic stimulation, were also observed. Analysis of the prion protein gene revealed methionine homozygosity at codon 129 without any mutations.

The patient was admitted for further investigation.

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The pulvinar sign in a case of PLE

PULVINAR SIGN IN PLE

The pulvinar sign in PLE occurs when there is a high signal intensity in the pulvinar nucleus on T2-weighted images. This finding is considered a sensitive indicator of PLE. In a series of 50 cases studied by Scheid et al., 2 only one patient exhibited thalamic involvement, which was rare in PLE. Furthermore, thalamic hyperintensities are regarded as the “pulvinar sign,” which is a characteristic finding in PLE.

Neoplasms commonly associated with PLE include carcinoma of the lungs, testis, and breasts. Association of non-Hodgkin's lymphoma with PLE is rare, and only two cases have been reported previously. Association of non-Hodgkin's lymphoma with PLE is rare, and only two cases have been reported previously. In a series of 50 cases studied by Scheid et al., 2 only one patient exhibited thalamic involvement.

In summary, we report the first case of PLE with non-Hodgkin's lymphoma exhibiting the pulvinar sign on MRI. The pulvinar sign is a sensitive indicator of PLE, and its presence should be considered in the differential diagnosis of cases with suspected PLE. Further research is needed to confirm the sensitivity and specificity of the pulvinar sign in the diagnosis of PLE.
T2-weighted MRI. The exclusion of other possible disorders, especially treatable disorders such as PLE, is important in the differential diagnosis of vCJD. It is noteworthy that PLE may exhibit clinical and neuroradiological manifestations similar to those of vCJD.

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Competing interests: none declared

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