There are several causes of adult-onset chorea, with Huntington’s disease (HD) being the most common. We report a patient who developed a complex movement disorder consisting of chorea and dystonia associated with caudate atrophy on brain magnetic resonance imaging (MRI) because of a paraneoplastic etiology that can be easily confused with HD.

He was found to have elevated titers of Purkinje cell cytoplasmic antibody (PCA-2) in the serum and cerebrospinal fluid (CSF).

A 70-year-old Caucasian male with no pertinent past medical history was referred for complaints of unintentional weight loss, weakness, and involuntary movements. Over the past year, he had experienced progressive weakness in his legs such that he required a walker. As his weakness progressed, he developed bladder and bowel incontinence, further gait decline, and 60-pound (27-kg) weight loss.

During the course of his weight loss and gait decline, he developed involuntary movements in the upper extremities suggestive of dystonia. The following investigations were negative or normal: human immunodeficiency virus (HIV), anti-nuclear antibodies (ANA), serum creatine phosphokinase, and vitamin B12 levels. A movement neurophysiology study showed co-contraction of agonist and antagonist muscles in the upper extremities suggestive of dystonia. The following investigations were negative or normal: human immunodeficiency virus (HIV) serology, ANA, vitamin B12, and copper levels. Electromyography and nerve conduction studies did not show evidence of neuropathy or motor neuron disease. A movement neurophysiology study showed co-contraction of agonist and antagonist muscles in the upper extremities suggestive of dystonia. The following investigations were negative or normal: human immunodeficiency virus (HIV) serology, ANA, vitamin B12, and copper levels.

MRI of the brain showed bilateral caudate atrophy along with globular parenchymal loss (Figure 1). MRI studies of the cervical, thoracic, and lumbar spine with and without contrast were normal. Electromyography and nerve conduction studies did not show evidence of neuropathy or motor neuron disease. A movement neurophysiology study showed co-contraction of agonist and antagonist muscles in the upper extremities suggestive of dystonia. The following investigations were negative or normal: human immunodeficiency virus (HIV) serology, ANA, vitamin B12, and copper levels.
virus 1/2 antibody, Human T-cell lymphotropic virus (HTLV) I/II antibody, copper, vitamin B12, ceruloplasmin, ferritin, peripheral smear for acanthocytes, antinuclear antibody, thyroid stimulating hormone, thyroperoxidase antibody, celiac disease panel, creatine kinase, aspartate transaminase, alanine transaminase, vitamin E, antiphospholipid antibody, syphilis antibody immunoglobulin (IgG), and glutamic acid decarboxylase (GAD65) antibody. A polymerase chain reaction-based assay was utilized to detect cytosine–adenine–guanine (CAG) repeat expansions in exon 1 of the HTT gene (Huntingtin), which showed 19/20 CAG repeats. A paraneoplastic antibody panel performed in both the serum and CSF showed elevated titers of PCA-2 (1:15,360 in the serum and 1:512 in the CSF). Computed tomography scan of the chest, abdomen, and pelvis demonstrated left mediastinal adenopathy and a positron emission tomography scan showed hypermetabolism in the same area that was suspicious for malignancy. A biopsy of the lymph node was negative for malignancy and the patient chose to be transferred to a hospice after seven sessions of plasma exchange failed to show any benefit. Owing to recurrent infections, treatment with other immunosuppressive agents was not considered.

PCA-2 was identified by Vernino et al.1 in 10 patients with subacute neurological syndrome associated with small cell lung cancer (SCLC). This antibody has been reported to cause ataxia, encephalitis, motor neuropathy, dysautonomia, and Lambert–Eaton myasthenic syndrome.1,2 PCA-2 is specific for the presence of SCLC and it has not been reported to be associated with any other cancer. The biopsy for the presence of malignancy can initially be negative, as it was in our case.1,2 The following antibodies were found in a review of 14 cases of paraneoplastic chorea: CRMP-5 (collapsin response-mediator protein 5)-Ig, amphiphysin-IgG, GAD65, VGCC-P/Q type (voltage-gated calcium channel), striational, anti-Hu, and anti-Ri.3 Our case is the first in the literature to identify PCA-2 leading to a hyperkinetic movement disorder (chorea–dystonia in our case) associated with caudate atrophy on brain MRI. A case of chorea with caudate atrophy associated with SCLC was described in 1997. This patient was later

Video 1. Neurologic Examination Demonstrating a Complex Movement Disorder. The video shows dysarthria and jaw opening as well as tongue protrusion dystonia that improves while drinking and is suppressible. There is dystonic posturing of the hands while using the towel and blepharospasm on the left side. The chorea is evident in the neck, trunk, and upper limbs. The latter part of the video shows some improvement of the above-mentioned movements with clonazepam.

Figure 1. Neuroimaging Study. Magnetic resonance imaging of the brain axial T1 (A) and coronal T1 (B). Axial T1 and coronal T1: bilateral caudate atrophy with global parenchymal loss.
found to have anti-Hu antibody and showed transient improvement with intravenous corticosteroids. It is rare for a paraneoplastic etiology to cause a combination of hyperkinetic movement disorder and caudate atrophy. Paraneoplastic etiology of chorea tends to be more common in older male patients with coexisting peripheral neuropathy or weight loss. The two other disorders associated with chorea and caudate atrophy are chorea–acanthocytosis and McLeod syndrome. These two conditions are usually associated with areflexia and muscle atrophy. The presence of upper motor neuron signs, paucity of chorea in the lower extremities, lack of psychiatric features, and normal extraocular movements distinguish our patient’s clinical picture from classic HD. The treatment of paraneoplastic neurologic disorders involves treating the underlying cancer and immunotherapy. If the antibody is directed towards the cell surface antigen (e.g. anti-N-methyl-D-aspartate receptor encephalitis) then plasma exchange or intravenous immunoglobulin may result in some improvement by removing the antibody. However, neurologic dysfunction can also be mediated by the cytotoxic T-cells when the antigen is intracellular (e.g. PCA-1, PCA-2, GAD65, etc.) as in our case. The response to immunotherapy in such cases can be variable and cyclophosphamide should be considered because it is directed at the cytotoxic T-cell response.

References
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