Case Report

Subacute Combined Degeneration: A Case With Spinal MRI Findings Improving Before The Clinical Features

Nicer Korkut BIÇAK, Neşe ÇELEBİSOY
Ege Üniversitesi Tip Fakültesi, Nöroloji Anabilim Dalı, İzmir

Abstract

We report a 66-year-old lady with myelopathy due to vitamin B12 deficiency. Spinal MRI revealed coalescent hyperintensities of the dorsal cervical and thoracic spinal cord on T2-weighted images. After three months of vitamin B12 treatment MRI findings disappeared before complete remission of the clinical features.

Keywords: Subacute combined degeneration, spinal magnetic resonance imaging

INTRODUCTION

Vitamin B12 deficiency is a common problem in elderly subjects and can cause several neurological complications. The most frequent is peripheral neuropathy which is followed by subacute combined degeneration (SCD) of the spinal cord. Optic neuropathy and dementia are the other consequences(6). SCD is characterized by dysfunction of posterior and lateral tracts of the spinal cord and goes with numbness of the limbs and the body as early symptoms. Weakness, clumsiness, spasticity, abnormal reflexes, gait ataxia develop later. The diagnosis is based on the symptoms, the above mentioned signs and decreased serum vitamin B12 levels(5). However, approximately 30-40% of patients with neurological symptoms have borderline levels. Elevated serum methylmalonic acid and homocysteine levels, which are substrates for cobalamin dependent enzymes are helpful when there is diagnostic uncertainty(9). A few publications report that magnetic resonance imaging (MRI) of the spinal cord is a good diagnostic tool with characteristic findings(3,6). We herein report a patient with MRI findings supporting the diagnosis of SCD, in whom the spinal cord lesions improved very fast with treatment before clinical improvement.

CASE PRESENTATION

A 66-year-old woman was admitted with a 2 months history of paraesthesia of both lower limbs followed by ataxia of stance and gait. Her previous medical history was unremarkable. There was no evidence of motor weakness. The deep tendon reflexes were increased and plantar reflexes were bilaterally extensor. Severe impairment of position and vibration sense of both feet was detected. She had a wide based gait; Romberg’s sign was positive. The results of heel-to-knee testing were normal. Blood tests revealed 11.4 g/dl hemoglobin (12-
35% hematocrit (35-45), 92 fl mean corpuscular volume (80-96) and 30 picograms mean corpuscular hemoglobin (27-33). Vitamin B12 and folic acid levels in the serum were 33 picograms (197-866) and 15 micrograms (3-16) respectively. Serum homocysteine level was 28 mcm/l (5-15). The rest of the biochemical parameters were within normal limits. Nutritional status was normal with no restrictive dietary habits. Gastroscopy revealed chronic atrophic gastritis. Electromyography and nerve conduction study revealed normal results. MRI of the head was normal. However, MRI of the spine showed coalescent hyperintensities of the dorsal cervical and thoracic spinal cord on T2-weighted images (Fig 1a, b). T1-weighted images revealed no contrast enhancement of the lesions. With the clinical, laboratory and imaging findings the diagnosis of subacute combined degeneration was made and the patient was put on vitamin B12 injections 1mg I.M daily for two weeks and once weekly thereafter. When she was seen three months later, she was complaining about only a mild paraesthesia of her legs. However, there was marked improvement in ataxia of stance and gait. Control spinal MRI performed at that time showed that the cervicothoracic lesions had disappeared.

Figure 1: Axial T2-weighted magnetic resonance images of the thoracic spinal cord shows hyperintensity involving the posterior columns before treatment (A), hyperintensity disappears after three months of vitamin B12 treatment (B).

DISCUSSION
Subacute degeneration of the dorsal columns of the spinal cord associated with vitamin B12 deficiency is called funicular myelosis. Here, the cervical and thoracic medullary white matter especially the posterior and the lateral columns (funiculi) are primarily affected. The white matter tracts involved show demyelination with degeneration of myelin sheaths and axonal loss. Involvement of the posterior columns leads to paresthesia, impaired
proprioception and loss of vibration sense, whereas involvement of the lateral columns leads to paresis\(^{5}\). The described medullary changes can be visualized on MRI. Intramedullary hyperintensity seen on the T2-weighted images is thought to be due to demyelination. Axonal loss occurs later to a lesser degree. Multifocal contrast enhancement of the cervical cord after administration of gadolinium DTPA, indicating blood-barrier disruption has been reported\(^{2}\). Spinal MRI seems to be a good diagnostic tool in SCD and is also advantageous for the follow-up evaluation. Persistence of abnormal signals after appropriate therapy due to wallerian degeneration and gliosis has been reported\(^{1}\). One interesting point in our patient was the improvement of the spinal lesions in just three months time with treatment, preceding the clinical improvement.

**Correspondence to**

Nicer Korkut Bıçak
E-mail: nicer26@gmail.com

**Received by:** 04 July 2006

**Revised by:** 28 July 2006

**Accepted:** 21 September 2006

**The Online Journal of Neurological Sciences (Turkish) 1984-2007**

This e-journal is run by Ege University Faculty of Medicine, Dept. of Neurological Surgery, Bornova, Izmir-35100TR as part of the Ege Neurological Surgery World Wide Web service.

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**Journal of Neurological Sciences (Turkish)**
Abbr: J. Neurol. Sci.[Turk]
ISSNe 1302-1664

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