

Case Report

A CASE OF REVERSIBLE CERVICAL MYELOPATHY

*Vismay Naik¹ and Jay Shah²

¹Department of Medicine, Baps Yogiji Maharaj Hospital, Ahmedabad, Gujarat, India

²Department of Radiology, Medimax Imaging Centre, Ahmedabad, Gujarat, India

*Author for Correspondence

ABSTRACT

Sub acute combined degeneration of spinal cord (SCD), a treatable non-compressive myelopathy, is a rare cause of demyelization of the dorsal and lateral columns of the spinal cord. It is a complication of vitamin B12 deficiency, which is reversible if diagnosed and treated early. MRI reveals hyper intensities involving dorsal columns of spinal cord in cervical and upper dorsal region. We present a case of a 40-year-old male patient with symptoms of tingling and numbness in all four limbs and MRI showing diffuse hyper intensity on T2WI involving the posterior columns. A diagnosis of sub acute combined degeneration of the spinal cord was considered and confirmed by laboratory findings. The patient showed complete recovery on B12 therapy.

Keywords: Sub Acute Combined Degeneration, Myelopathy, Vitamin B12 Deficiency

INTRODUCTION

Sub acute combined degeneration of spinal cord is a potentially reversible cause of myelopathy, if diagnosed and treated early. This specific type of neuronal degeneration results from Vitamin B₁₂ deficiency. It usually involves the dorsal columns, lateral corticospinal and lateral spinothalamic tracts of spinal cord. Patients usually complain of insidious onset of sensory symptoms followed by motor involvement which may progress to paraplegia in neglected cases. Magnetic Resonance Imaging (MRI) shows hyper intense signal intensity in the posterior and lateral part of spinal cord. Cervical spinal cord is usually involved; however thoracic spinal cord may be involved in some cases.

CASES

A 40-year-old male patient presented with complaints of tingling and numbness in both upper and lower limbs for the past 1 month. The symptoms started initially with tingling sensation in both the hands which later involved the feet and gradually progressed to involve both the arms and legs. There was no associated weakness or any symptoms of visual disturbance or sphincter incontinence. Patient was a strict vegetarian with no history of malabsorption or gastro-intestinal surgery. He did not smoke or drink alcohol and was not taking any medications.

On neurological examination of his sensory system, there was significant impairment in the joint position and vibration sense in the upper limbs and mild impairment in the lower limbs. His fine touch and pin-prick sensations were preserved. Romberg's test was positive. Examination of his motor system and cranial nerves were normal. Deep tendon reflexes were hyperactive in both upper and lower limbs with bilateral flexor plantars.

His blood investigations revealed Haemoglobin level of 11.4 gm/dl with a MCV of 102 fl. Peripheral blood smear showed macrocytic RBCs. Serum Vitamin B12 level was 115 pg/ml (180-800 pg/ml). Blood sugar levels and thyroid function was normal. MRI of the spine revealed hyper intensity in cervical cord from C1 to C6 levels involving the posterior column (Figure 1 and 2). Patient was diagnosed with sub-acute combined degeneration of spinal cord due to Vitamin B12 deficiency and was treated with Injection Cyanocobalamine 1000mcg I/M daily for 7 days followed by weekly injection for 1 month. After 1 week his symptoms started improving and he was completely relieved of his symptoms by the end of 1 month.

DISCUSSION

Vitamin B12 deficiency causes a wide range of hematological, gastrointestinal, and neuropsychiatric disorders (Reynolds, 2006). Myelopathy, neuropathy, dementia, behavioral changes, and optic nerve

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involvement are common neurologic manifestations of vitamin B12 deficiency. Subacute combined degeneration of the spinal cord is the most common neurological manifestation of Vitamin B₁₂ deficiency. In western countries, pernicious anemia is the most common cause of its deficiency, however, alcoholism, malnutrition and ileocecal tuberculosis are the common causes in India. The diagnosis of B12 deficiency is made by a low serum B₁₂ level, or if the B₁₂ level is borderline, elevated levels of the metabolites homocysteine and methylmalonic acid. The hematologic changes, mostly megaloblastic anemia, may be absent in one quarter of patients with neurologic syndromes (Dharmarajan and Norkus, 2001).



Figure 1: Sagittal T2W MRI showing Hyperintensity in cervical cord from C1 to C6 levels involving posterior column



Figure 2: Transverse T2W MRI showing Bilateral symmetrical hyperintensity in the posterior columns of cervical cord

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B12 deficiency impairs function of Methionine Synthetase and Methylmalonyl CoA mutase. This leads to production of abnormal fatty acids and elevated levels of Methylmalonic acid, which are toxic to myelin (Srikanth *et al.*, 2002).

The main symptoms of SCD are paresthesia, stiffness, numbness or tingling of the limbs; sensory ataxia; and impaired vibration and joint position sensation. Spastic paraparesis may develop if SCD is left untreated. Babinski's sign may be present, and the deep tendon reflexes are variable. If these symptoms are associated with macrocytic anemia, the possibility of SCD should be strongly considered (Rabhi *et al.*, 2011).

MRI findings reveal increased signal involving the posterior columns of cervical and thoracic cord. Lateral column involvement on MR imaging is usually not apparent. MR imaging is useful in distinguishing the different causes of intramedullary myelopathy. Differential diagnosis includes multiple sclerosis (MS), inflammatory disorders (sarcoidosis), infections(HIV & herpes simplex), ischemia and neoplasms (astrocytomas and ependymomas) (Chand and Maller, 2008). Presence of long segments of hyper intensities involving posterior columns along with characteristic history and laboratory findings confirms the diagnosis. MRI signs are reversible with early treatment with vitamin B12. SCD can also result from common variable immunodeficiency syndrome, paraneoplastic malabsorption, folate deficiency, acute monoblastic leukemia and nitrous oxide anesthesia (Bou-Haidar *et al.*, 2009).

Conclusion

Vitamin B12 deficiency is the most common cause of sub-acute combined degeneration of spinal cord and usually involves the posterior and lateral columns of the cervical and upper dorsal parts of spinal cord. MRI of the spine show increased T2-weighted signal in the posterior columns of the cervical and/or thoracic spinal cord. Early diagnosis is important as the condition is curable with prompt replacement of vitamin B12. Irreversible neurological impairment may occur if the treatment is delayed.

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