

Subacute combined degeneration of the spinal cord

亞急性脊髓混合退化症

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We report a case of a 79-year-old gentleman presenting with numbness of both hands. A magnetic resonance imaging of the cervical spine demonstrated features suggestive of subacute combined degeneration of the spinal cord which was further supported by a low serum vitamin B₁₂. This is a reversible condition if early diagnosis can be made and vitamin B₁₂ therapy promptly given. Delayed treatment can result in irreversible neurological impairment. (*Hong Kong j.emerg.med.* 2010;17:79-81)

本文報告一名79歲男士雙手麻木的個案。頸椎的磁力共振造影提示有亞急性脊髓混合退化的病徵，而進一步的證據為低血清維他命B₁₂。如果能及早診斷及迅速以維他命B₁₂治療，可以逆轉這疾病。延遲治理可能引致不可逆轉的神經受損。

Keywords: Aged, spinal cord diseases, subacute combined degeneration, vitamin B₁₂ deficiency

關鍵詞：老年、脊髓疾病、亞急性混合退化病、缺乏維他命B₁₂

Case report

The patient was a 79-year-old gentleman who presented with numbness of both hands in May 2009. Cervical myelopathy was suspected. Cervical spine MR imaging demonstrated a fairly symmetrical abnormally increased T2 signal hyperintensity at the posterior columns extending from the mid-C2 level down to the

mid-C6 level (Figures 1 & 2). In addition, there was mild cervical spondylosis associated with mild posterior disc prolapses (C3/C4, C4/C5, C5/C6 and C6/C7 discs) but without obliteration of the thecal sac space or compression of the cervical spinal cord. The serum vitamin B₁₂ level was <150 pg/ml (normal adult [fasting]: 193-982 pg/ml), serum folate level was 17.8 ng/ml (normal adult [fasting]: 3-17 ng/ml) and the VDRL (Venereal Disease Research Laboratory) test was non-reactive.

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Discussion

Vitamin B₁₂ (cyanocobalamin) is found essentially in all meat and dairy products. It is an essential vitamin for DNA and fatty acid synthesis, including myelin synthesis.¹ Vitamin B₁₂ deficiency can be caused by gastrointestinal malabsorption, poor nourishment of food or genetic deficiency of methylmalonyl-CoA mutase. Patients may present with haematological (megaloblastic anaemia), gastrointestinal and neuro-

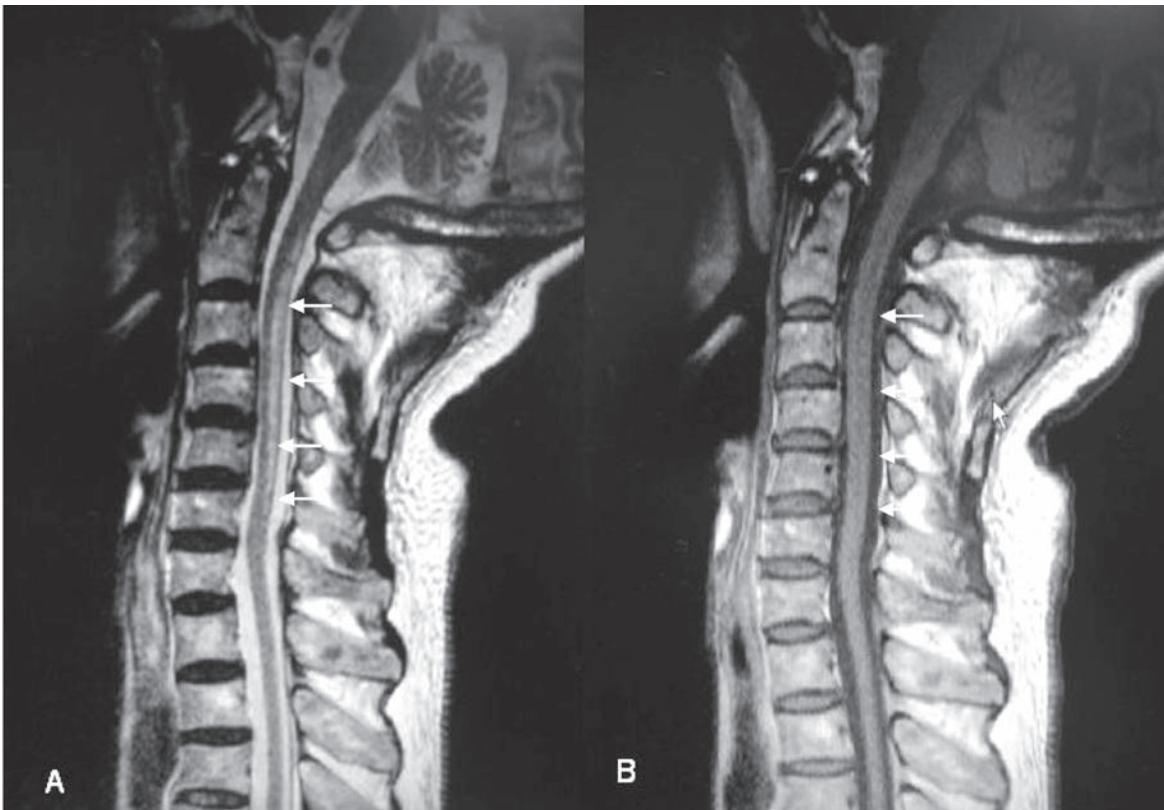


Figure 1. MRI sagittal view of the cervical spinal cord. (A) T2W demonstrating hyperintensity (brightness) in the posterior columns from mid-C2 level to mid-C6 level (white arrows). (B) T1W demonstrating iso-intensity of the posterior columns with the anterior columns (white arrows).

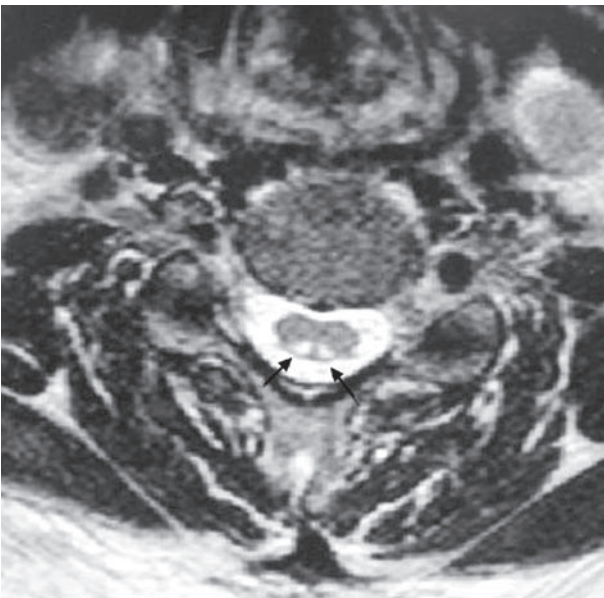


Figure 2. MRI T2W axial view of the cervical spinal cord demonstrating symmetrical hyperintensities in the posterior columns (black arrows).

psychiatric manifestations. The neuro-psychiatric manifestations involve the brain, spinal cord, optic nerve and peripheral nervous system. In the early stage of the disease, the spinal cord appears to be affected first.² The predominant involvement of the posterior columns of the spinal cord results in impairment of position and vibration sense and dysaesthesia.

The extent of involvement usually includes the posterior and lateral columns of the lower cervical and upper thoracic spinal cord. Extension to the conus medullaris,³⁻⁵ and involvement of the anterior column have been reported.²

The increased T2 weighted signal hyperintensity of the spinal cord may result from demyelination, Wallerian degeneration and gliosis. The affected spinal cord segment may demonstrate mild swelling and contrast enhancement but may appear atrophic especially in

longstanding cases. With early and adequate treatment, complete resolution or interval improvement in the MRI findings can be expected. However, persistent high signal intensity has been reported despite adequate treatment.^{3,6,7}

The initial clinical presentation of subacute combined degeneration of the spinal cord is often paraesthesia of the hands and feet which eventually may progress to include sensory loss, gait ataxia, distal limb weakness and ataxic paraplegia. Clinical findings include loss of vibratory sense, impairment of joint positional sense, weakness, spasticity, hyperreflexia and extensor plantar responses.

The radiological differential diagnoses of subacute combined degeneration of the spinal cord are broad and include demyelinating disorders (multiple sclerosis), infectious causes (HIV and herpes viruses), inflammatory processes (sarcoidosis), ischaemia, and neoplasms (astrocytomas and ependymomas). However, in the case of subacute combined degeneration, the abnormal signal intensity is particularly prominent in the dorsal columns and is usually contiguous in length over several vertebral bodies.⁸

The diagnosis of B₁₂ deficiency is confirmed by a low serum B₁₂ level or elevation of its metabolites (homocysteine and methylmalonic acid). Treatment of B₁₂ deficiency depends on the cause and often includes monthly B₁₂ intramuscular injections for life.^{9,10}

Conclusion

Early diagnosis of subacute combined degeneration of the spinal cord is important because the condition is curable with prompt replacement therapy. The degree of resolution of clinical symptoms is inversely proportional to the duration and severity of Vitamin B₁₂ deficiency.^{8,9} In the event of delayed treatment,

irreversible disabling neurological impairment may occur. Although the MRI findings of subacute combined degeneration are not specific but the features will arouse clinical suspicion of this treatable condition. As early diagnosis and treatment is often followed by reversal of the neurological deficits, emergency physicians should be vigilant for this uncommon condition.

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