Clinical notes

Magnetic resonance imaging of the spinal cord in a man with tabes dorsalis

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Background: Tabes dorsalis is a late manifestation of untreated syphilis that is characterized by ataxia, lancinating pains, and urinary incontinence. A form of tertiary syphilis or neurosyphilis, it is the result of slow, progressive degeneration of the nerve cells in the spinal cord.

Method: Case report.

Findings: A 39-year-old man presented with tingling paresthesia in the lower limbs, difficulty in walking, and loss of vision. Magnetic resonance imaging (MRI) of the dorsal spine showed intramedullary hyperintensity and cord atrophy, similar to changes seen in subacute combined degeneration. MRI features of tabes dorsalis have not been described previously to the best of our knowledge.

Conclusion: MRI findings in this patient with tabes dorsalis were similar to those seen in subacute combined degeneration, which is characterized predominantly by cord atrophy and intramedullary hyperintensities.

Keywords: Tabes dorsalis, Syphilis, Myelitis, Meningomyelitis, Neurosyphilis, Neuroimaging, Spinal cord atrophy, Optic atrophy, Ataxia

Introduction

Jean-Alfred Fournier in 1875 hypothesized that there may be a syphilitic origin for tabes dorsalis, which is characterized by general paresis, optic atrophy, myelitis, and Argyll–Robertson pupil.¹ The term is Latin, *tabes* meaning ‘decay’ and *dorsalis* means ‘of the back’. Of people infected with *Treponema pallidum*, 3–5% develop neurosyphilis; 5% of those individuals develop tabes dorsalis, a form of late tertiary syphilis, 10–20 years later.²

Another form of neurosyphilis reported in the literature is syphilitic myelitis, which is distinct from tabes dorsalis.^{3,4} Other forms of spinal cord involvement in syphilis have also been described.^{5,6}

We describe the magnetic resonance imaging (MRI) findings in a patient with tabes dorsalis. These neuroimaging abnormalities have not yet been described in the literature to our knowledge.

Case presentation

Case report

A 39-year-old man presented with numbness and paresthesia of both lower limbs for 5 years and difficulty

in walking for 2 years. While walking he had to watch his feet; he also encountered greater difficulty navigating in poor light, and narrow spaces. One year prior he noticed gradually progressive loss of vision in both eyes without any history of diplopia or ocular pain. He also had lancinating pain in both lower limbs for 2 years, and erectile dysfunction and depressed mood for 1 year.

He gave a past history of sexual contact with multiple sex partners including commercial sex workers. He had a history of genital chancre 20 years before and had been diagnosed with syphilis, which was treated with herbal medications.

Physical examination

On examination he had cervical and inguinal lymphadenopathy and an old healed chancre of the glans penis. Visual acuity in both eyes was limited to perception of hand movements only. Pupillary examination showed light near dissociation (constriction on accommodation but no reaction to light) suggestive of Argyll–Robertson pupil. Fundus examination was suggestive of bilateral primary optic atrophy. Both lower limbs were measured grade 5/5 on the MRC scale (Medical Research Council for Testing Muscle Strength) and deep tendon reflexes were absent. Bilateral extensor plantar reflexes

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Figure 1 Sagittal (A) and axial (B) section of T2WI on MRI showing intramedullary hyperintensity and cord atrophy in dorsal spinal cord

were present. In the upper limbs, motor power and deep tendon reflexes were normal. Posterior column sensation including joint position and vibration were impaired below the anterior superior iliac spine. Sensory examination was normal for pain and temperature. Romberg's test was positive. Gait was ataxic and of the stamping type. There were no cerebellar signs. In view of sensory ataxia, primary optic atrophy, Argyll–Robertson pupil, and previous history of syphilis, a clinical diagnosis of tabes dorsalis was made.

Diagnostic workup

VDRL (Venereal Disease Research Laboratory) test was significantly positive in serum (1:64 dilutions) and cerebrospinal fluid (CSF) (1:32 dilution). CSF *Treponema pallidum* hemagglutination assay was also positive. CSF examination was normal (no cells, protein 34 mg/dl, glucose 64 mg/dl), HIV enzyme-linked immunosorbent assay (ELISA) was negative and serum vitamin B₁₂ level was within normal limit (768 pg/ml). Tests for hepatitis B and C, antinuclear antibody, C-reactive protein, and rheumatoid factor were negative. MRI of the spine revealed cord atrophy and intramedullary hyperintensity on T2-weighted imaging without any enhancement on gadolinium, suggestive of focal myelitis (Figs 1A and B). MRI of the brain was within normal limits. He was treated with aqueous crystalline penicillin G, 3 million units intravenously every 4 hours for 14 days, which failed to relieve his symptoms.

Discussion

Neurosyphilis is divided into early and late forms. Early forms (primary and secondary) affect the mesodermal structures and late (tertiary), the parenchyma of the spinal cord and brain. There are three types of tertiary syphilis – late benign or gummatous, and cardiovascular, and neurosyphilis.⁷

Tabes dorsalis is the commonest presentation of late tertiary syphilis. Tabes dorsalis, a sequela of untreated syphilitic infection, is much less common since the availability of screening and antibiotics. It is a progressive degenerative process involving demyelination and inflammatory changes of the spinal cord. The dorsal root ganglion, nucleus fasciculus, posterior column tract, and lumbosacral roots are more susceptible to demyelination. In advanced cases, anterior horn cells may also be involved. Gait deteriorates in stages from pre-ataxia, to ataxia, and then paralysis. Bowel and bladder dysfunction occurs in 90% of cases.

Tabes dorsalis is usually characterized by a triad of neurological symptoms: unsteady gait, lightning-type pains, and urinary incontinence/sexual dysfunction, as in this case. Other symptoms that may occur include seizures, stroke, behavioral changes, headache, dizziness, and hearing impairment.⁷

Typical neurological findings include loss of vibratory, position and proprioceptive sense, and Argyll–Robertson pupil. Charcot joint, hyporeflexia, Romberg sign, are also relatively common findings, as seen in this patient. Syphilitic optic atrophy⁶ is considered a separate entity that is seen in less than 10% of cases.

Onset of symptoms occurs decades after the initial infection; the mechanism for the late development of progressive deterioration of tertiary syphilis remains unclear. Response to treatment is poor. Treatment with penicillin does not reverse the symptoms, as was the case for this patient.

Neuroradiological findings of patients with neurosyphilis have been previously described and labeled as syphilitic meningomyelitis.^{8,9} However, we are not aware of descriptions of MRI findings in tabes dorsalis. While this entity is uncommon, clinicians should be aware of its radiological presentation.

Conclusion

We report the neuroimaging findings in this man with tabes dorsalis. The MRI findings were similar to those seen in subacute combined degeneration, which is characterized predominantly by cord atrophy and intramedullary hyperintensities.¹⁰

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