Toxoplasmosis Myopathy as a Possible Manifestation of Immune Reconstitution Inflammatory Syndrome

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Introduction

Toxoplasma gondii (*T. gondii*) is the most common focal central nervous system (CNS) opportunistic infection in the Acquired Immune Deficiency Syndrome (AIDS) population (1). Concurrent toxoplasmosis infection of the spinal cord, brain, and muscle has never been reported together in a patient *ante mortem*. We report the first case of toxoplasmosis presenting initially with myelitis in the absence of encephalitis that subsequently progressed to myositis and encephalitis despite anti-parasitic treatment.

Case Report

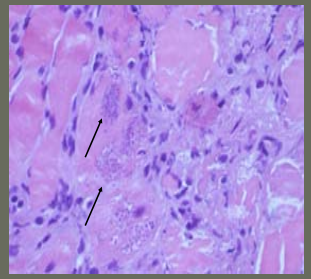
A 34 year-old man with a history of HIV/AIDS noncompliant with highly active anti-retroviral therapy (HAART) presented to the hospital with a six month history of bilateral lower extremity weakness and a sensory level at L4. His CD4+ T-lymphocyte count was 67 cells/mm3 and human immunodeficiency virus (HIV) RNA level was 41,000 copies/ml. Cerebrospinal fluid (CSF) studies were unrevealing.

An enhanced MRI of the spine, demonstrated an expansive intramedullary enhancing lesion at T11 through T12. The patient underwent laminectomy and spinal cord decompression, and pathological studies of the excised lesion revealed *T. gondii* cysts. His *Toxoplasma* IgG levels was 1.4 IU/ml (normal range <6.4). He was treated with sulfadiazine and pyrimethamine and continued on HAART. He gradually improved and was transferred to an inpatient rehabilitation facility.

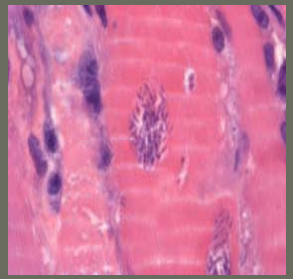
Twenty-seven days later, the patient became hypotensive and was transferred back to the acute care hospital. He was now dysarthric and diffusely weak in all of his extremities. His serum creatinine kinase level (CK) was 788 IU/L. Repeat CSF studies were all within normal limits. His CD4+ count had **increased to 277 cells/mm3 and the HIV RNA level was 531 copies/ml**. Both serum and CSF *T. gondii* IgG and IgM were negative. There were no new lesions on an MRI of the spine but an enhanced MRI of the brain showed two enhancing lesions that were compatible with *T. gondii* infection.

An EMG/NCS showed a sensorimotor neuropathy superimposed upon a predominantly proximal myopathic process. A muscle biopsy revealed areas of necrotic muscle demonstrating lymphocytic and plasma cell infiltrates with abundant *T. gondii* cysts.

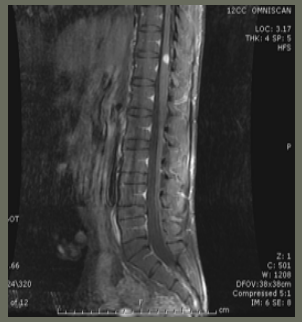
Figures



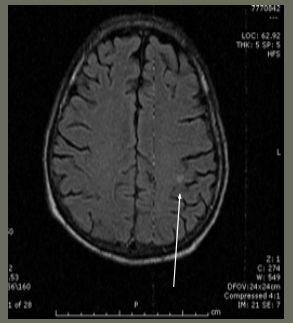
Mixed predominantly lymphocytic and plasma cell infiltrate with abundant *Toxoplasma* bradyzoites in necrotic muscle



Toxoplasma cysts were also found in non-necrotic muscles.



Enhancing lesion between T11-T12 found on first presentation causing bilateral lower extremity weakness and a sensory level at T4



Enhancing parietal lesion in CNS seen on his second admission. This lesion was not present on his first admission.

Contact Info/Disclosure Statement

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Discussion

There have been several different descriptions of skeletal muscle toxoplasmosis in the literature and the exact relationship between *T. gondii* and inflammatory myopathy remains unclear. *T. gondii* alone in muscle may not induce myositis (2). On the other hand, myositis in the presence of high titers of anti-Toxoplasma IgG does not guarantee finding *T. gondii* organisms in muscle (3, 4). It is possible that an immune disturbance may reactivate latent Toxoplasmosis and induce an inflammatory myopathy (5). The most recent hypothesis suggests that Toxoplasma myopathy occurs in two phases. In the acute phase, the organisms can be found in muscle and treatment with standard antiprotozoal therapy is beneficial. In the chronic phase patients have increased anti-Toxoplasma antibodies without *T. gondii* organisms despite myositis and treatment with antiprotozoal therapy is ineffective (4). Ultimately, the factors necessary for *T. gondii* to initiate the myopathic process remains unknown.

It is difficult to determine the precise reason for our patient's deterioration. His rapid decline despite antiprotozoal treatment after the start of HAART therapy suggests possible Immune Reconstitution Inflammatory Syndrome (IRIS). In IRIS, patients clinically deteriorate or have an unexpected illness associated with laboratory or objective confirmation of immune restoration (6). Most cases of IRIS in AIDS patients are attributed to bacterial, viral or fungal cases. There are many fewer cases describing parasitic infection (7). The initial presentation of toxoplasmosis myelopathy progressing to another rare finding of *Toxoplasma* cysts in muscle makes this case a unique and interesting topic of discussion.

References

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