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JC Virus Induced Longitudinally Extensive Transverse Myelitis in Immunocompromised Patient

Ghada A. Mohamed
Henry Ford Health System

Gamal el Din Osman
Henry Ford Health System

Hassan Abd El Noor
Henry Ford Health System

Daniel Newman
Henry Ford Health System

Angelos Katramados
Henry Ford Health System

Case report: JC virus induced Longitudinally Extensive Transverse Myelitis in immunocompromised patient

Ghada A Mohamed MD, Gamal el Din Osman MD, Hassan Abd el Nour MD, Daniel Neuman MD, Angelos Katramados MD
Department of Neurology, Henry Ford Hospital, Detroit, Michigan

Introduction

- John Cunningham virus (JCV) is a human polyomavirus that causes a fatal demyelinating disease of the central nervous system (CNS) called progressive multifocal leukoencephalopathy (PML).
- Primary JCV infection occurs asymptomatically during childhood. The virus replication remains suppressed by cellular immunity, it remains dormant usually in the kidneys, lympho- reticular system, or brain tissue. Seventy to ninety percent of adults are seropositive for the JC virus and the viral DNA is detected in the urine of 20% to 30% of immunologically intact adults.
- Reactivation of dormant virus is seen most commonly in the setting of HIV infection, hematologic malignancy, or with iatrogenic immunosuppression due to failure of cellular immune surveillance to suppress viral replication.
- CSF is characterized by elevated protein levels but no pleocytosis. These findings indicate that signs of universal or meningeal inflammation are not suggestive of PML.
- PML lesions are typically multifocal at the grey white matter junction in the brain, cerebellum, and brain stem that are contrast non enhancing.
- Mefloquine, a drug approved for malaria therapy, has recently shown to influence the activity of JCV in a screening bioassay when it is applied on a human glial cell line infected with JCV. Mirtazapine, an inhibitor of 5HT2A-receptor, which may be used by JCV for cell entry has been shown to inhibit the infection of a human astroglia cell line.
- Primary PML disease should be differentiated from PML-immune reconstitution inflammatory syndrome (PML-IRIS), which may develop in patients with JCV CNS infection in the setting of recovery of the immune system.
- The lesions are contrast enhancement on neuroimaging due to severe inflammation and demyelination with marked infiltration by macrophages and CD8+ T lymphocytes.

Case Report

A 62 years old male presented with rapidly progressing bilateral lower extremity weakness and difficulty walking for less than a month.

His medical history is significant for chronic lymphocytic leukemia and chemotherapy induced hypogammaglobinemia that was managed with monthly intravenous immunoglobulin and remained free of relapses until 2018.

Case Report Cont.

His symptoms started with left lower extremity flaccid weakness and prominent fasciculations that rapidly extended to involve the right leg. Shortly thereafter, he developed urinary and fecal incontinence. His work up showed elevated CSF protein at 90 gm/dl, negative bacterial growth, HSV 1 and 2, VZV, CMV, and West Nile viral PCR, IgG index oligoclonal bands and malignant cells. Serum anti Aquaporin-4 and anti-MOG antibodies were undetectable.

EMG showed mildly prolonged distal sensory latencies, slight decrease in the motor amplitudes and frequent fasciculations with no evidence of denervation

Magnetic resonance imaging (MRI) of the brain and spine showed non-enhancing T2 FLAIR hyper intense lesions involving the ponto-medullary junction, and the spinal cord extending from T10 to the conus medullaris. The patient was started on IV pulse steroids for 5 days, followed by a course of oral prednisone of 60 mg daily. However, the weakness progressed to involve both his upper extremities

Repeat MRI of the brain and spine showed severe progression of the T2/FLAIR hyperintense lesions involving the posterior pons, medulla oblongata and entire spinal cord. All parenchymal lesions were non-contrast enhancing. The conus medullaris had a tumefactive appearance.

Repeated CSF analysis showed elevated protein of 93 positive JCV PCR.

Follow up EMG showed progression of the disease with evidence of wide spread radiculopathy and anterior horn cell involvement. Prednisone was gradually tapered off. Patient received a 5-day course of IVIG.

His condition continued to deteriorate with involvement of respiratory and bulbar muscles. Patient condition continued to deteriorate with involvement of respiratory and bulbar muscles and eventually family withdrew care.

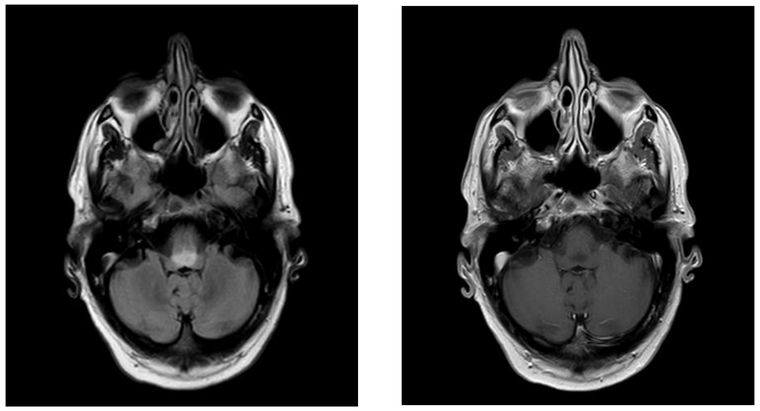
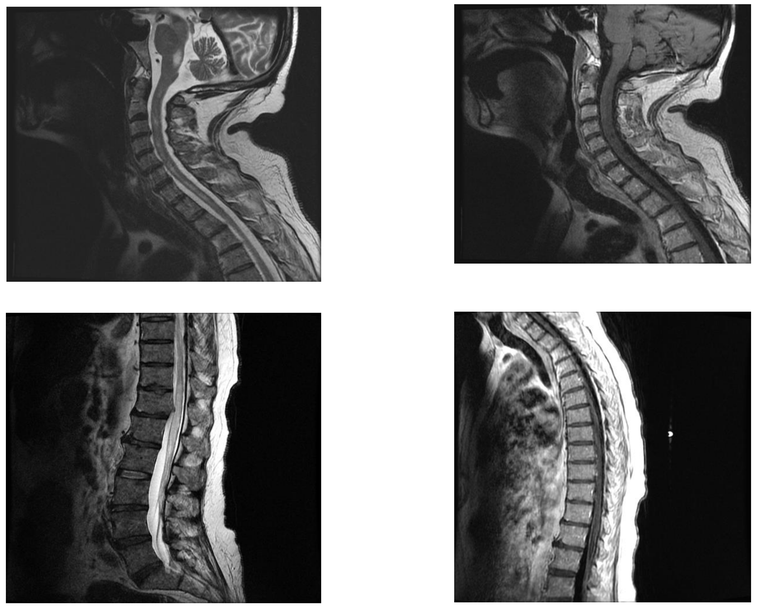


Image 1: T2 hyperintense lesion involving the posterior pons, medulla oblongata that is non- contrast enhancing

Case Report Cont.



Images 2: spinal cord T2 hyperintense lesions, all non-contrast enhancing

Conclusion

JC virus CNS infection is a rare but frequently fatal disease. It should be suspected in immunosuppressed patients with rapid neurological decline. Typically, it affects the brain and the cerebellum, however it should be included in the differential diagnosis for LETM, particularly if the lesions are non-contrast enhancing. JCV PCR is sensitive and specific as a useful tool for diagnosis. While no effective treatment has been identified reconstitution of the immune state might suppress the viral replication. PML-IRIS is an autoimmune condition that might result from hyper-immune reaction in the setting of immune reconstitution and usually respond to high dose IV steroids or IVIG.

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