

# Title: Delayed Diagnosis of Voltage-Gated Potassium Channel Antibody-Associated Limbic Encephalitis in a Patient with Long-Standing Neurologic Decline

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## Case

A 72-year-old previously highly functional male, independent in all basic and instrumental activities of daily living (ADLs), presented with a 20-year history of progressively worsening gait impairment and functional decline, during which he was repeatedly misdiagnosed. He was initially evaluated by a neurologist at Tulane and diagnosed with Parkinson's disease for which treatment was initiated without symptomatic improvement. Over time, his symptoms progressed, including impaired ambulation and fine motor dysfunction. A subsequent neuropsychiatric evaluation was unremarkable. He was later evaluated by a neurologist in Baton Rouge and diagnosed with post-poliomyelitis syndrome despite no prior history of poliomyelitis, compatible poliovirus exposure, or suggestive symptoms. He was referred to a neurologist at Louisiana State University Health Sciences Center in New Orleans, where he underwent comprehensive testing including lumbar puncture, neuroimaging, and serologic studies. He was found to be seropositive for antibodies targeting the voltage-gated potassium channel (VGKC) complex. He began treatment with intravenous immunoglobulin (IVIG). Prednisone was later initiated, and mycophenolate mofetil was added to his regimen. Despite these interventions, his condition progressively worsened over time. Due to increasing medical complexity, limited insurance coverage for home health services, and caregiver burden, he was transitioned to a long-term care facility in 2022, where he currently resides.

## Discussion

Voltage-gated potassium channel (VGKC) complex antibody-associated limbic encephalitis is a rare autoimmune neurologic disorder involving antibodies directed against proteins associated with neuronal potassium channels, most commonly leucine-rich glioma-inactivated 1 (LGI1) and contactin-associated protein-like 2 (CASPR2). Clinical presentation is often heterogeneous and may include cognitive impairment, seizures, movement disorders, and behavioral changes. Due to its nonspecific presentation, this condition is frequently misdiagnosed, particularly in older adults where symptoms may overlap with more common neurodegenerative disorders.

This case highlights the diagnostic challenges associated with VGKC antibody-associated limbic encephalitis and emphasizes the importance of comprehensive evaluation, including antibody testing, in patients with atypical or progressive neurologic symptoms. Early recognition and timely initiation of immunotherapy, such as IVIG and corticosteroids, alone or in combination, have been associated with improved neurological and cognitive outcomes.

VGKC antibody-associated encephalitis should be considered in patients presenting with unexplained or atypical cognitive decline. Increased clinical awareness and early antibody testing may reduce diagnostic delays and improve patient outcomes.