Bilateral Todd's paralysis after status epilepticus

Razan Hussein BS, Cameron Miller BS, Edwin J. Paul MPH, Ben Thiravetyan MD, J Drew Payne, DO

Abstract

Todd's paralysis is a transient postictal neurologic deficit most often presenting as unilateral weakness that resolves within 48 hours. Bilateral involvement is exceedingly rare and can closely mimic acute spinal cord or neuromuscular pathology. This Clinician's Corner case describes a young woman who developed acute bilateral lower-extremity weakness following status epilepticus, with complete spontaneous recovery within 32 hours. The case highlights key diagnostic features of bilateral Todd's paralysis and emphasizes a practical, clinically oriented approach to evaluation and management.

Keywords: Todd's paralysis, Status Epilepticus, Postictal paralysis, Epilepsy, Neurologic deficits

Case Summary

A 27-year-old woman with a remote history of a single unprovoked seizure nine years earlier presented after multiple generalized tonic–clonic seizures occurring in rapid succession while attending a basketball game. Witnesses described sudden loss of consciousness, tonic extension, and rhythmic jerking of all extremities lasting approximately two minutes, with incomplete recovery before subsequent events. Emergency medical services documented three seizure episodes prior to hospital arrival.

On presentation, the patient was alert, oriented, afebrile, and hemodynamically stable. Neurologic examination revealed symmetric bilateral lower-extremity weakness (Medical Research Council grade 3/5 proximally and distally), decreased light touch, temperature, and vibration sensation below the inguinal folds, and hyporeflexia. Cranial nerves, upper extremity strength, and coordination were normal, and plantar responses were flexor bilaterally. The patient reported urinary hesitancy without incontinence.

Given the acute onset of bilateral weakness, urgent evaluation for central nervous system and spinal pathology was pursued. Computed tomography of the head without contrast, magnetic resonance imaging of the brain and thoracic–lumbar spine without contrast, and electroencephalography demonstrated no acute abnormalities. Neurology consultation recommended initiation of levetiracetam for presumed epilepsy.

Over the subsequent 32 hours, the patient experienced complete resolution of motor, sensory, and reflex deficits without additional intervention. No further seizures occurred during hospitalization. She was discharged on levetiracetam with outpatient neurology follow-up. The overall clinical course was most consistent with bilateral Todd's paralysis following status epilepticus.

Discussion

Background

Todd's paralysis is a transient postictal neurologic deficit that classically presents as unilateral weakness following a seizure and resolves within minutes

Corresponding author: **Razan Hussein**
Contact Information: Razan.Hussein@ttuhsc.edu
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to 48 hours. It is most commonly observed after focal-onset seizures but may also follow generalized tonic–clonic seizures, particularly when seizures are prolonged or occur in clusters. Although reported in up to 13% of patients with focal epilepsy, bilateral involvement is exceptionally rare and sparsely described in the literature.[1–3] This case report presents a rare instance of bilateral Todd's paralysis following status epilepticus in a patient with a remote, previously untreated seizure history.

Presentation and diagnosis

The diagnosis of Todd's paralysis is clinical and relies on recognition of a characteristic temporal relationship between seizure activity and subsequent neurologic deficit. In typical cases, focal weakness or sensory loss develops immediately after the ictal event and improves spontaneously. Bilateral presentations, such as in this case, pose a greater diagnostic challenge because they may closely resemble acute spinal cord compression, inflammatory myelopathy, or peripheral neuropathy. Key diagnostic features include a clear seizure antecedent, absence of structural abnormalities on neuroimaging, and rapid, complete resolution of symptoms.[1,3,8,9]

Neuroimaging is often warranted initially, particularly when deficits are bilateral or accompanied by sensory or autonomic symptoms, to exclude emergent central nervous system pathology. Electroencephalography may be normal in the postictal period and does not exclude the diagnosis.[3] While functional neurologic disorder is an important consideration in cases of acute bilateral weakness, the temporal relationship to witnessed seizures, objective examination findings, and predictable spontaneous recovery are more consistent with bilateral Todd's paralysis. In this case, normal postictal cognition and EEG do not preclude Todd's paralysis.

Pathophysiology

The underlying mechanisms of Todd's paralysis are incompletely understood. Proposed mechanisms include transient neuronal exhaustion, postictal cortical inhibition, and regional hypoperfusion following ictal hypermetabolism. Perfusion imaging studies have demonstrated reversible reductions in cerebral blood flow in the affected cortex during the postictal period, supporting a functional rather than structural etiology.[4,5] Bilateral Todd's paralysis is hypothesized to occur when seizures originate in or rapidly propagate to regions with bilateral motor representation, particularly the supplementary motor area, which has extensive interhemispheric connections.[6,7] She was found to have motor power grade III, in accordance with the Medical Research Council scale, in both proximal and distal muscles of her bilateral lower extremities.

Management and evaluation

Management of Todd's paralysis is supportive and centers on treatment of the underlying seizure disorder. Acute interventions directed at the neurologic deficit itself are generally unnecessary, as symptoms resolve spontaneously. However, recognition of Todd's paralysis is critical to avoid unnecessary invasive testing, prolonged immobilization, or empiric therapies such as corticosteroids or immunomodulatory agents. In patients with new-onset or recurrent seizures, initiation or optimization of antiseizure therapy and appropriate outpatient neurology follow-up are essential components of care. Although bilateral or generalized Todd's paralysis has traditionally been considered rare, emerging case reports, including those describing global paresis, suggest that such presentations may be underrecognized and underreported in the peer-reviewed literature.

Key Points

- Todd's paralysis is a common postictal phenomenon but is usually unilateral
- Bilateral postictal weakness is rare and may mimic spinal cord or peripheral nerve disease
- A clear seizure antecedent, normal imaging, and rapid recovery are central to diagnosis
- Early recognition can prevent unnecessary testing and interventions

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From: Texas Tech University Health Sciences Center School of Medicine, Lubbock, TX (RH, CM, EJP, BT, JDP)
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