**CLINICAL VIGNETTE**

# Why Am I Twitching?

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***Case Report***

A 79-year-old woman presented to urgent care for evaluation of "twitching of her body" for two days. Patient explained that the "twitching" was an uncontrollable movement of her left sided extremities. She explained that her left arm and leg, including her hands and feet, felt very restless and she could not stop them from unexpected "flinging". The symptoms were new and occurred throughout the day and night. She had no fall or head trauma but reported a fever last week which resolved, and a mild cough which improved. Patient denied any pain, numbness or tingling in her arms and legs.

The patient has a history of paroxysmal atrial fibrillation, depression, migraine headaches, lumbar degenerative joint disease, sciatica, hypertension and seasonal allergies. Her daily medications include aspirin, citalopram, and metoprolol. She typically lives in her own home and is independent in all of her basic and instrumental activities of daily living. The patient stayed with her daughter when the symptoms started as she was concerned that they would impact her ability to safely ambulate and perform her activities of daily living.

Her physical examination showed normal vital signs and general examination. Her neurological examination included normal strength, range of motion, and coordination. Romberg was negative and she had no tremor with intention or at rest. However, when sitting, she had a visible twitching – uncontrollable movement -- of her left upper and lower extremities. The urgent care physician diagnosed these symptoms to be "acute unilateral akathisia" of an unclear source. Given the physician's findings and diagnosis, the patient was referred for an urgent brain magnetic resonance imaging (MRI) and neurology consultation.

The patient underwent a brain MRI two days later, on a Friday, and returned home. Her uncontrollable left sided twitching & restlessness continued. Her brain MRI was read by the radiologist on Sunday showing a small, 4 mm right thalamic lesion, likely subacute hemorrhage. The urgent care physician reviewed the results of the brain MRI, informed the patient of the findings, and advised her to go to the emergency room (ER) for further evaluation and treatment and the Neurology consultation.

In the ER, the patient underwent brain computed tomography (CT) whiched showed no change and reported a stable subacute hemorrhage. Neurology was consulted and reported large amplitude, choreiform movements in the left arm and leg, and related wide based gait. Neurosurgery was consulted and recommended a brain magnetic resonance angiogram (MRA) for further assessment of the vascular source. The brain MRA showed findings similar to the prior brain MRI and CT and no intervention was required. The neurologist diagnosed the patient with acute hemiballismus due to the subacute hemorrhage, and noted that the left sided choreiform movements corresponded to right thalamic bleed. The neurologist advised the patient to stop aspirin, maintain normal blood pressure, start outpatient physical therapy, and to undergo follow-up brain CT angiogram and neurology visit in one month.

***Discussion***

What is hemiballismus? Ballismus is a condition characterized by acute or subacute development of large amplitude, involuntary movements of the proximal parts of the limbs. These movements are twitching or flinging. Hemiballismus is when the symptoms affect the limbs on one-half of the body and is the most common. Other types of ballismus are based on where the symptoms are located and include monoballism (one limb), biballismus (both sides) and paraballismus (both legs).

Ballismus is often classified with chorea as the symptoms appear to cross-over and both may exist at the same time. Both have jerking or flinching motions and general features include movements that are unpredictable and involuntary, non-patterned, and have variable speed, timing and direction. Chorea involves distal limbs, face, and trunk and is low amplitude. Ballism affects the proximal limbs, is large amplitude, appears flinging or kicking, and occurs at rest and more noticeably with action.

Hemiballismus is uncommon and typically caused by a structural lesion or metabolic dysfunction in the region of the subthalamic nucleus of the basal ganglia. While the subthalamic nucleus is most common, the source could be in the following areas with similar symptoms -- the caudate nucleus, putamen, internal capsule, thalamus, and rarely the cerebral cortex or subcortical white matter.[1] In older patients, the source is usually due to a vascular etiology such as an ischemic stroke or a subdural hemorrhage. In younger patients, infectious or inflammatory causes are more common.[1] Non-ketotic hyperglycemia hemichorea-hemiballismus cases are a rare and

uncommon form of hemiballismus. Patients typically have the same symptoms as hemiballismus due to elevated glucose.[2,3]

Patients with hemiballismus need treatment of the uncontrollable movements as well as the cause.[1] The ongoing, unexpected movements can lead to exhaustion, falls, and injury, and complicate recovery.[4,5] Treatment starts by addressing the underlying etiology of the hemiballismus. If the movements are persistent, disruptive, and place the patient at high risk of injury, then management of the ballistic movements is needed and anti-dopaminergic agents have been shown to be the most effective.[1] Commonly used dopamine antagonists are haloperidol and atypical antipsychotic agents, such as risperidone, and should be started at low dose.[1,5] Patients should be followed by a neurologist due to the complexity of source, symptoms, and management. Patients with chronic hemiballismas, refractory to medical treatment and with no improvement over time, may require an intervention, such as deep brain stimulation or surgery on the underlying source.[5] Patients with non-ketotic hyperglycemia hemichorea-hemiballismus typically resolve symptoms with glycemic control.[2,3] Most cases of hemiballismus have a favorable outcome with either spontaneous resolution or improvement of movements over time as the underlying source resolves.[1]

The patient had a follow-up brain CT angiogram one month later which showed complete resolution of the subacute hemorrhage. She had an outpatient appointment with the neurologist who advised her to resume aspirin and continue physical therapy. At her follow-up appointment with her primary medical doctor two months later, she reported mild left sided weakness, poor balance, and a rare twitch of her left leg. The patient continued outpatient physical therapy, and her symptoms completely resolved at her follow-up appointment six months later.

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