describe a 52-year-old woman with a navicular stress fracture that presented with a stiff limb syndrome (SLS). There has been one case report of acute torticollis associated with rib stress fractures[1] but there have been no reports of fractures presenting with stiff limbs or any other movement disorder.

A 52-year-old woman with a past medical history significant for breast cancer status post double mastectomy, radiation, and chemotherapy 5 years prior was referred to the movement disorders clinic by her orthopedist for right foot pain and cramping of her entire right leg. One month prior to admission, the patient noticed that her big toe on the right side was "stuck up." She then noted that her whole foot would hyperextend. This was followed by severe spasms in the foot and leg forcing her to crawl on her hands and knees instead of walking. Shewas prescribed diazepam, up to 40 mg per day, which significantly relieved her symptoms.

Her physical examination was significant for spontaneous and continuous extension of the right big toe and an exaggerated arch of the right foot at rest and with action. The right ankle was plantar flexed and stiff as was the right gastrocnemius. No other abnormal movements were noted. There was no point tenderness to palpation. She could not place the heel of her foot on the ground with ambulation due to continued plantar flexion of the foot. Her deep tendon reflexes were 2+ and symmetric. The left toe was flexor and the right toe was spontaneously upgoing. No paraspinal or axial contractions were palpated.

A comprehensive metabolic panel, complete blood count, and creatine kinase were normal. An MRI of the brain with and without gadolinium and electromyography and nerve conduction studies were normal, although exteroceptor reflexes were not tested. Paraneoplastic panel, including antiamphiphysin, antiglutamic acid decarboxylase, and antivoltage gated sodium channel antibodies were negative. An MRI of the right lower extremity was obtained and showed a nondisplaced intraarticular fracture of the medial aspect of the navicular bone with diffuse edema. The patient was placed in a walking cast and discharged with analgesics and orthopedic follow-up.

Our patient's history, clinical examination findings, and response to benzodiazepines were all very suggestive of SLS. "SLS" is a variant of "stiff person syndrome" (SPS), a disorder characterized by progressive muscular rigidity and spasm. It is typically symmetric and most prominent in axial and proximal limb muscles. When the symptoms are restricted to a limb (usually the leg) it is referred to as SLS, although often this progresses to involve the axial musculature as well.[2] The absence of continuous motor unit activity when relaxed and abnormal cutaneomuscular reflexes argues against the diagnosis of SLS and should prompt the search for another cause.[2] In our patient, imaging of her foot demonstrated the navicular fracture. Recent studies have shown that navicular fractures make up 14–35% of all stress fractures.[3,4] Vague symptomatology and elusive radiographic localization typically lead to a delay in diagnosis averaging 4 months from initial symptom onset.[5] To date, there has only been one case report of stress fractures of the first rib in a child presenting as torticollis.[1] There have been no prior reports of stress fractures presenting as limb dystonia, SLS, or any other movement disorder. This patient demonstrates an extremely unusual presentation of a stress fracture—as a movement disorder. The diagnosis was initially missed by an orthopedic foot specialist and shows an unusual cross between orthopedic medicine and neurology.

Jordan S. Dubow, MD
Cindy Zadikoff, MD*
Department of Neurology
Northwestern University Feinberg
School of Medicine
Chicago, Illinois, USA
**E-mail: czadikof@nmff.org*

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Zonisamide in Patients with Essential Tremor and Parkinson's Disease

Essential tremor (ET) and Parkinson's disease (PD) are two of the most frequent pathologies in movement disorders. Although they are considered distinct disorders, there is overlap in some features. The postural tremor preceding the onset of parkinsonian features, the presence of Lewy bodies in ET patients demonstrated in autopsy studies, and overlap abnormalities on functional neuroimaging and midbrain sonography are some of the most important data supporting the association between these two pathologies. Recently, Shahed and Jankovic[1] have reviewed the evidence for and against this association and the name "ET-PD syndrome" has been proposed for this entity.

Except for individual studies of β-blockers in PD tremor and the beneficial effects of stimulation of the cerebellar receiving zone in the ventralis intermedius nucleus of the thalamus in controlling both ET and PD tremors,[2] drugs used to treat either ET or PD are not effective in controlling symptoms of the other disorder. On the other hand, zonisamide has recently demonstrated effectiveness both in ET and motor symptoms of PD.[3,4] We evaluate the safety and efficacy of this drug in patients with "ET-PD syndrome".

Six patients were enrolled in this study. All of them include a history of postural or acting tremor (at least five years) before the onset of parkinsonian features. Two of them had limb and voice tremor, two had head and limb tremor, one had trunk and limb tremor, and the last one only limb tremor. Four patients had acting tremor and two had both acting and postural tremor.

Published online 12 September 2007 in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/mds.21717

With regard to parkinsonian features, bradykinesia, rigidity, and gait impairment were present in all of them. Resting tremor was present in five of them and re-emergent tremor[5] (rest tremor that re-emerges after a variable delay while maintaining posture) was also present in five of them. Since these patients presented characteristics of both ET and PD, they were diagnosed with "ET-PD syndrome". They initiated zonisamide at 50 mg/day as an add-on therapy to other drugs and was titrated until 200 mg/day. The duration of the treatment was at least 60 days and they were at least 45 days on the maximum dosage. Tremor (including acting, postural, and resting) was improved in four patients according to Clinical Global Impression. Other parkinsonian symptoms, such as rigidity and bradykinesia, were also improved in five of them according to Unified Parkinson's Disease Rating Scale (mean change from baseline was −4.1). Somnolence (two patients) and paresthesias (one patient) were the principal side effects although no patient abandoned the drug because of them.

Although zonisamide was originally used as a broad-spectrum antiepileptic agent, it has demonstrated effectiveness in many other pathologies such as impulse control disorders, chronic pain, or refractory migraine.[6] It has multiple mechanisms of action, including blockage of sodium and T-type calcium channels, inhibition of carbonic anhydrase, inhibition of glutamate release, and biphasic effects on the dopaminergic system. To that respect, therapeutic doses of zonisamide increase intracellular and extracellular dopamine in the rat striatum[7] while supratherapeutic doses reduce intracellular dopamine. This dual effect may also be the cause of the several cases of restless legs syndrome due to zonisamide described in the literature.[8,9] On the other hand, studies performed on experimental tremor in rats suggest that the antitremor effects may be achieved by a nondopaminergic mechanism.[10]

Although the exact mechanisms of action remain unknown, clinical and experimental data suggest that zonisamide may be useful as a therapy for patients with ET or PD and, according to the results obtained in our patients, this drug may play a role in the treatment of "ET-PD syndrome".

Pedro Emilio Bermejo, MD
Department of Neurology
Puerta de Hierro University Hospital
Madrid, Spain
**E-mail: pedro_bermejo@hotmail.com*

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