The twitching leg

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Abstract
A 87-year-old man was admitted to the Acute Stroke Unit and incidental spontaneous movements were seen at rest. Differential diagnosis and ancillary tests are discussed in this article.

Keywords: Fasciculation, neurological examination, radiculopathy

Abbreviations: ALS: amyotrophic lateral sclerosis EMG: electromyography MRI: magnetic resonance imaging

Clinical Scenario / Question
An 87-year-old gentleman was admitted after sudden dysarthria and left facial palsy due to a right internal carotid artery occlusion. On examination, incidental spontaneous movements were seen at rest in the left leg (video), with bilaterally diminished Achilles reflexes. Patient was unaware of this finding. Muscle atrophy and hypesthesia were not present. When walking on heels, left foot dorsiﬂexion was impaired.

What kind of physical ﬁnding is shown in this video?

http://youtu.be/cmhCoYCAC20

A. Myoclonus
B. Dystonia
C. Tremor
D. Chorea
E. Fasciculation
F. Myokymia

Answer / Discussion
Focal fasciculations in the tibialis anterior muscle are shown. When walking on heels, left foot dorsiﬂexion was slightly impaired.

Fasciculation is a brief, twitching, spontaneous involuntary contraction affecting muscle ﬁbres served by one motor unit, which may be visible under skin. When present, they reﬂect denervation.

A complete history intake and neurological examination will lead to a sensible diagnostic work-up and to set a prognosis. Clinical differential diagnosis is presented in table 1.

Localization helps in diagnosis: fasciculations can be generalised, in metabolic-toxic conditions, the benign fasciculation syndrome and degenerative disorders of anterior horn of spinal cord, as amyotrophic lateral sclerosis; segmental, as in syringomyelia; or focal, affecting the muscles controlled by a nerve or spinal root. When fasciculations are in a distribution that cannot be explained by plexus, root or nerve lesion amyotrophic lateral sclerosis (ALS) must be ruled out as soon as possible.

Table 1: Key points for clinical diagnosis

<table>
<thead>
<tr>
<th>Movement Type</th>
<th>Description</th>
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<tr>
<td>Myoclonus</td>
<td>Brief, shocklike involuntary contraction of a muscle or group of muscles</td>
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<tr>
<td>Dystonia</td>
<td>Involuntary muscle contraction that can cause slow repetitive movements or abnormal postures</td>
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<tr>
<td>Tremor</td>
<td>Involuntary rhythmic contraction of antagonistic muscles</td>
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<tr>
<td>Chorea</td>
<td>Involuntary irregular movement that starts in one part of the body and moves unpredictably and contiuously to another part, like “dancing”</td>
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<tr>
<td>Myokymia</td>
<td>Involuntary spontaneous quivering, writhing movements within a single muscle not extensive enough to cause a movement of a joint</td>
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Evolution ﬁndings are also pivotal. The absence of muscle atrophy suggests that an acute or subacute nerve lesion is present, although a limited chronic nerve lesion cannot be excluded based on that observation alone. A clinical examination should be repeated at least every six months to assess progression, muscle weakness, upper motor neuron signs and other ﬁndings, such as bilateral wasting of the tongue, the “split hand”, head drop, emotionality and cognitive or behavioral impairment.

It is also very important to rule out any possible metabolic disorder, as toxic conditions. Earl Grey tea intoxication has been reported as a cause of widespread fasciculations and cramps.

Electromyography (EMG) is the recording of the electrical activity of the muscles. It supports the clinical suspicion and
helps in the topographic diagnosis. If ALS is suspected, a systematic examination of clinically uninvolved muscles has to be done for 2 minutes as fasciculations are the hallmark of this condition. As fasciculation potentials in ALS and benign fasciculation syndrome are indistinguishable on grounds of waveform parameters and there is not a reliable biological marker of the disease, a minimum follow-up of 6 months is required before setting a prognosis. When non-progressive isolated fasciculations of the tibialis anterior muscle, it has to been examined the 5th lumbar root and the deep peroneal nerve, as localizer sensory symptoms may be absent, and to rule out any more diffuse neurogenic processes.

Magnetic resonance imaging (MRI) is supportive to EMG findings as it is very sensitive in detecting anatomic changes that could be responsible for the radiculopathy, but there are other causes of radiculopathy besides nerve root compression. Moreover, lumbar disk protrusions can be found in asymptomatic patients independent of age. Therefore, MRI is not appropriate if pain or foot drop are not present.

Finally, an isolated chronic left L5 radiculopathy was diagnosed related to lumbar spondyloarthrosis.