BJMP 2014;7(2):a716

Medicine in Pictures

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 hypoesthesia 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

Myoclonus	Brief, shocklike involuntary contraction of a muscle or group of muscles
Dystonia	Involuntary muscle contraction that can cause slow repetitive movements or abnormal postures
Tremor	Involuntary rhytmic contraction of antagonistic muscles
Chorea	Involuntary irregular movement that starts in one part of the body and moves unpredictably and continously to another part, like "dancing"
Myokymia	Involuntary spontaneous quivering, writhing movements within a single muscle not extensive enough to cause a movement of a joint

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[1]

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[2]

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[3] 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[4], 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[5]. 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.

Competing Interests
None declared
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