

Levodopa end-of-dose dystonia successfully treated by neuromuscular taping: A case report



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Case report

Off dystonia

Neuromuscular taping

Dystonia due to levodopa-end-of-dose is the most common type of dystonia in Parkinson's disease, affecting up to 30% of the patients [1]. Careful adjustment of pharmacological therapy is the first line treatment to provide optimal management of "off" periods, in addition to symptomatic treatment with benzodiazepines, baclofen, botulinum toxin, lithium and eventually, deep brain stimulation of the subthalamic nucleus [2].

We describe for the first time, a patient where neuromuscular taping was used to treat "off" dystonias.

Neuromuscular taping (NMT) is a physical therapy technique where an elastic drug free tape is applied without tension in order to lift the skin from the underlying fascia and soft tissue, to allow decompression. Recently, taping with some extent of tension (Kinesio Taping - KT) has been reported to improve pain in cervical dystonia [3] and effectively manage axial dystonia in Parkinson's disease [4]. Therefore, we decided to try a similar approach in a patient with levodopa-end-of-dose dystonia, where other pharmacological treatments failed, causing severe pain and disability.

A fifty-years-old female patient with a diagnosis of Parkinson's disease since the age of 41, reported dystonia of the first right toe from the very onset of the disease, with rest tremor of the foot, bradykinesia and rigidity of the right side of the body. Family history of Parkinson's disease or tremor was negative and there were no relevant medical concerns in her past history. Initially, she was treated with dopamine agonists, while levodopa-carbidopa was added after about four years. Two years later, wearing-off phenomenon started and was initially managed with safinamide 100 mg, but soon a very painful (VAS score 10/10) and disabling "off" dystonia of the right leg and foot started to appear after 3 h from the last dose of levodopa, with a frequency of about 4 attacks per week lasting 20–40 min. Treatment adjustments with entacapone, botulinum toxin and clonazepam were tried with little or no benefit. The dystonic movement was in abduction of the right thigh followed by intrarotation and extension of the foot and first toe, with flexion of the other toes. At the time of the NMT start (June 2018), the patient was taking levodopa-carbidopa 100 + 25 mg four to five times daily, safinamide 100 mg, levodopa-carbidopa extended release 200 + 50 at night and rotigotine patches 16 mg (UPDRS scores: part III "on" = 17, "off" = 62; part I-II = 14, part IV = 10).

The taping was applied to the antero-lateral and medial part of the right limb where the band was divided in 4 stripes, in order to act on an intermediate layer, and to the right calf as a double band under the heel, then upward medially and laterally to the calf. The next morning the patient

woke up without dystonia but she noticed three small depressions of the skin: one close to a visible contraction of the lateral gastrocnemius and two close to tibialis posterior and long flexor of the toes (Fig. 1). This phenomenon occurred other times, even though much less pronounced, was not accompanied by any pain and lasted the same time of a usual dystonia. The nature of this depression is difficult to ascertain although we believe it could be the result of a localized inhibition of the muscle's contraction or, in alternative, a temporary change of subdermal fluid circulation with oedema. In the following months the frequency of dystonia attacks reduced dramatically to one per week of mild intensity (pain VAS 4/10), lasting for no more than 10 min and a severe one (pain VAS 10/10), once a month, which included abduction of the thigh.

Through a tutorial video made by the physiotherapist, the patient is able to tape herself once a week, maintain the taping for 5 days (day and night) and rest for two, with no side effects apart from the sporadic depressions of the skin reported above. After one year from the NMT start, she still experiences benefit, complaining of severe dystonia once every 3 months (including abduction of the thigh) (pain VAS 10/10, duration 20–40 min) and minor attacks once a month (pain VAS 4/10, duration ~ 10 min), with an outstanding increase of the quality of her life (also due to substantial reduction of wearing-off phenomenon due to the start of opicapone 50 mg since March 2019, with reduction of the overall dopamine load). UPDRS scores part III were unchanged but part I-II improved more than 50% (6 vs 14), part IV scores were substantially unchanged due to the start of mild dyskinesia.

We believe that NMT was able to clearly abort a dystonia attack involving gastrocnemius, tibialis posterior and long flexor of the toes as a first action and subsequently prevent most of the attacks as an effect of inhibition of muscle contraction, as previously reported with Kinesio-taping on other kinds of dystonia [4]. This could be done by the continuous tension to the skin with consequent action to the fascia and eventually to muscle fibers inserted to the fascia [5], leading to a possible antidromic modulation of somatosensory processing. We believe that it would be worthwhile to study the effect of NMT on other kinds of focal dystonia too, where KT has already been proved to be effective [3].

In conclusion, we have reported the first case of levodopa end-of-dose dystonia to be successfully treated by NMT. We are aware that randomized placebo controlled studies are required to prove its efficacy, nevertheless we strongly suggest to take such a treatment into account before considering other more invasive and expensive therapies.

Disclosures

all authors have approved the final article.

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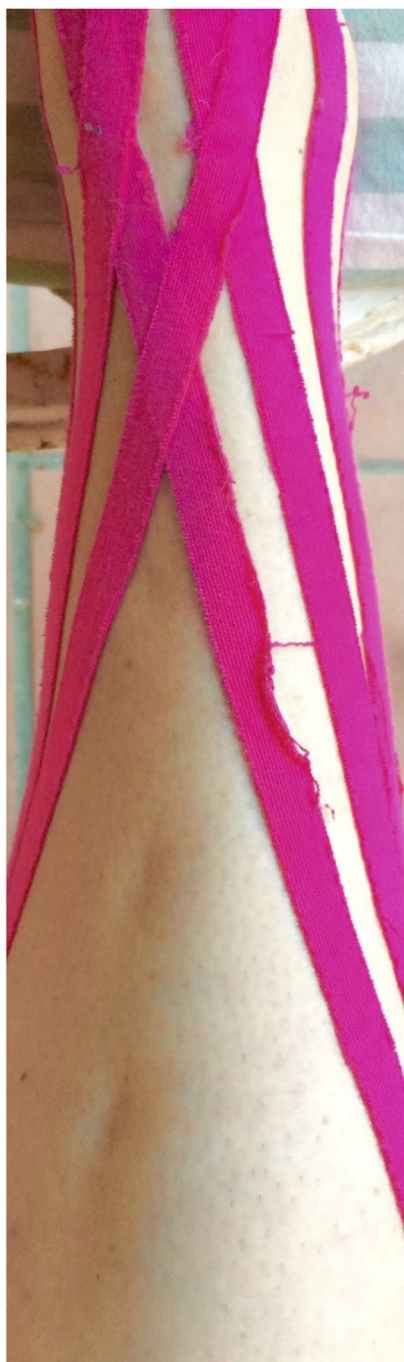


Fig. 1. The first morning after NMT: no dystonia but appearance of two spots of skin depression

Declaration of competing interest

None.

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