

*Short report*

## “Painful legs and moving toes”: the role of trauma

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**SUMMARY** A new syndrome was recently reported with the descriptive title of “painful legs and moving toes.” The present paper describes five patients who developed this syndrome following minor trauma to the legs, which in three patients was attributable to surgery. Various mechanisms that may underlie this unusual combination of severe leg pain with involuntary movements of the toes are discussed, as is the role of previous injury. The possibility is considered that whilst the condition may be generated peripherally, a persistent abnormality of the central nervous system subsequently develops.

“Painful legs and moving toes” is the descriptive term given to an unusual syndrome first recognised by Spillane and others in 1971.<sup>1</sup> The features of this syndrome are: involuntary and irregular movements of the toes and sometimes foot, with severe diffuse pain felt deeply in the foot and sometimes proximally in the leg. The disorder may affect one leg alone, sometimes spreads to involve both, and whilst in some patients the involuntary movements precede the development of pain, in most the pain occurs first. The cause of this very distressing condition is unknown, as is any measure that provides permanent pain relief. In the six cases comprising the original report, aetiological factors were not obvious, except that degenerative lumbosacral spine disease was noted in three patients. The syndrome has been described following herpes zoster infection, a traumatic lesion of the cauda equina, compression of the first sacral root by a cyst, and a peripheral nerve lesion affecting the musculocutaneous nerve in the leg.<sup>2</sup> The present report describes the occurrence of the syndrome in five patients, all of whom had sustained previous and often apparently trivial injury to the leg.

### Case reports

*Case 1* A 69 year old lady developed bilateral hallux valgus and hammer deformities affecting the second toes;

she subsequently underwent bilateral Keller’s procedures and spike fusion of the proximal interphalangeal joint of the second toes with satisfactory orthopaedic results. Within weeks of these procedures, she developed painful sensations in both feet, as if there was a hard rod inside them. There was a seething, crushing sensation felt deeply within the tissues, which worsened when she wore shoes. The pain was continuous although it did not interrupt sleep, and gradually increased in severity over the years. Examination revealed marked bilateral involuntary movements of the toes, with irregular writhing movements, sometimes flexion and extension and sometimes lateral, affecting the toes often independently but particularly the middle toes. She had been unaware of these movements until they were brought to her attention. There was neither pain on palpation nor cutaneous hypersensitivity. Electromyography (EMG) revealed features of denervation in the right abductor hallucis and extensor digitorum brevis muscles, and spontaneous units were seen discharging in the absence of toe movements at the time. A myelogram showed poor filling of the L3, 4 and 5 root sheaths bilaterally and termination of the theca at about S1. Regional intravenous guanethidine infusion improved her pain for only some hours.

Details of the remaining four patients are summarised in the table.

Methods of treatment which all failed have included: analgesics, anti-depressants, carbamazepine, benzodiazepines, steroids, anti-inflammatory agents, vitamin B12 injections, atropine-like drugs, propranolol, quinine sulphate, local cooling, local anaesthetic injections, vibration, transcutaneous electric stimulation and acupuncture. Sympathetic blockade, both by the regional intravenous guanethidine method and by sympathetic chain injection with phenol, proved only transiently beneficial.

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Accepted 4 February 1981

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Table Summary of case reports

Case	Sex	Age (yr)	Condition	Onset of symptoms after trauma	Symptoms	Signs	Investigations	Comments
2	F	56	Sprain of right Achilles' tendon	3 months	Pain in right foot spreading to lower leg; slight skin hypersensitivity; writhing toe movements after 6 months	Involuntary toe movements of right foot; occasional ankle movements	Myelogram: minor left L4/5 disc protrusion	Benefit with regional iv guanethidine and phenol sympathetic chain block
3	F	77	Bilateral hallux valgus; bilateral arthroses of 1st mp joints	8-10 years	Throbbing pain in right hallux; later spread to both feet	Writhing toe movements of both feet; transient decrease with effort	—	Scars re-explored twice
4	M	66	Traumatic haematoma of right hallux and forefoot	9 months	Gnawing, burning sensation in right hallux, later spreading to foot; exacerbated by tight shoes	Irregular toe movements of right foot; occasional asynchronous movements of left second toe	EMG: irregular motor unit discharges resembling fasciculations in right EDB	No causalgic features
5	F	57	Bilateral hallux valgus; insertion of Silastic joints	2 years	Painful burning, squeezing, tingling in toes of left foot; spread to dorsum and later, leg posteriorly	Irregular, asynchronous toe movements of left foot, sparing hallux	Normal EMG and myelogram	

**Discussion**

These five patients are reported to emphasise that the condition of “painful legs and moving toes” may occur after an interval following minor trauma to the lower leg or foot. In three patients trauma in the form of surgery had occurred, but in none was there evidence either of surgical misadventure or adverse reaction to drugs or anaesthetics. Trauma was due to an ill-defined tendinous sprain in one patient, and followed local soft tissue injury to the foot in another. Investigations proved unhelpful, although as others have reported,<sup>1,2</sup> in some patients electromyography revealed areas of denervation and myelography minor and non-specific changes. No effective long term treatment was found.

As possible causes, both disorders of nerve roots<sup>1</sup> and of afferent fibres in the posterior roots with activation of local circuits of interneurons and motor neurones<sup>2</sup> have been postulated. The clinical features, however, appear inconsistent with known radicular disorders. Although the development of spreading pain following local trauma in the present cases shows some resemblance to causalgia,<sup>3</sup> the lack of hyperpathia, soft tissue, bony and vascular changes, and poor response to sympathetic blockade argue against the syndrome being a form of this disorder.

In certain conditions, pain and involuntary movements occur together. Examples include undoubted central nervous system diseases such as the thalamic syndrome,<sup>4</sup> and possibly others such as limb pain with myoclonus<sup>5</sup> and Ekbom's syndrome.<sup>6</sup> Moreover, involuntary movement disorders including Parkin-

son's disease,<sup>7</sup> dystonia<sup>8</sup> and spasmodic torticollis,<sup>9</sup> may occur some time after trauma, and post-traumatic central pain states are also well recognised.<sup>10,11</sup> The combination of pain and involuntary movements, however, also occurs in conditions where the aetiology may lie in the periphery; these disorders can be generalised such as chronic pain with fasciculations,<sup>12</sup> or focal, as in the syndrome of myokymia and painful cramps.<sup>13</sup>

The distinction between central and peripheral origins may nevertheless be less well defined than at first appears. For instance, central nervous system function alters after peripheral nerve injury<sup>14</sup>; causalgia produced by peripheral nerve injury may spread beyond the original territory of the affected nerve suggesting spread within the central nervous system<sup>3</sup>; and surgically produced areas of sensory loss may be affected by pharmacological manipulation.<sup>15</sup> It is proposed that in “painful legs and moving toes,” minor peripheral trauma may set up a spreading, irritative central disorder possibly in the lower spinal cord, that involves to a variable extent sensory, motor and autonomic fibres.

I am grateful to Professor R W Gilliatt, Dr R W Ross Russell and Dr C B Wynn Parry for permission to report patients under their care, and Dr P W Nathan for kindly reviewing the paper and for valuable discussion.

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