

Lesão do Nervo Tibial Provocada por Meias de Compressão Abaixo do Joelho

Tibial Nerve Injury Caused by Below-Knee Compression Stockings

Nelson Ferreira Albuquerque⁽¹⁾ | Irina Peixoto⁽¹⁾ | Tiago Félix⁽¹⁾ | Mário Vaz⁽¹⁾ | Bruno Lopes⁽¹⁾
| David Coutinho⁽¹⁾ | Jorge Caldas⁽¹⁾

Resumo

Introdução: As mononeuropatias periféricas são uma das principais causas de acesso aos cuidados de saúde.

Caso Clínico: Mulher de 70 anos, iniciou quadro de dor inespecífica na região poplíteia. Após a realização de exames complementares de diagnóstico, foi colocada a hipótese diagnóstica de uma radiculopatia. Foi medicada com relaxantes musculares e anti-inflamatórios sem melhoria das queixas. Ao exame físico, tinha dor aparente à palpação dos tendões dos músculos semitendinoso e semimembranoso. Optou-se por realizar uma ecografia da região poplíteia e constatou-se que o nervo tibial apresentava uma dimensão aumentada em relação ao contralateral. Quando questionada, a paciente relatou que desde há dois meses que se encontrava a usar meias elásticas até a região do joelho. Foi realizada uma infiltração local do nervo com lidocaína que levou a uma regressão da sintomatologia.

Discussão: As lesões do nervo tibial tendem a ser incomuns em comparação com as do nervo peroneal, pois o nervo tibial tendencialmente situa-se numa região relativamente profunda.

Conclusão: Este caso clínico destaca o sinergismo que uma boa história clínica, aliada a um exame físico minucioso e aos valiosos detalhes dados pela ecografia pode criar no momento da avaliação, de forma a melhor completar a recolha de dados clínicos.

Palavras-chave: Lesões dos Nervos Periféricos/diagnóstico por imagem; Lesões dos Nervos Periféricos/tratamento; Meias de Compressão; Nervo Tibial/lesões.

Abstract

Introduction: Peripheral mononeuropathies are one of the leading causes of access to health care.

Case Report: A 70-year-old woman felt non-specific pain in the popliteal region. After the exams, it was thought to be a radiculopathy. Therefore, the patient was medicated with muscle relaxants and anti-inflammatories without improvement of complaints, though. On examination, she had apparent pain during palpation of the semitendinosus and semimembranosus tendons. This way, it was decided to make an ultrasound scan of the popliteal region, being verified that the tibial nerve had an increased dimension in comparison to the contralateral one. The patient reported that, for the past two months, she had been using elastic stockings up to the knee region. A nerve block was performed with lidocaine, which led to a successful regression of the symptomatology.

Discussion: Tibial nerve lesions tend to be uncommon as opposed to peroneal nerve lesions, since it is found in a relatively deep region.

Conclusion: This case report highlights the importance of having a good clinical history combined with a detailed physical examination and the valuable details given by the ultrasound analysis at the time of the evaluation, in order to complement the data collected.

Keywords: Peripheral Nerve Injuries/diagnostic imaging; Peripheral Nerve Injuries/therapy; Stockings, Compression; Tibial Nerve/injuries.

(1) Serviço Medicina Física e Reabilitação, Hospital de S. Teotónio, Viseu, Portugal.

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Autor correspondente: Nelson Ferreira Albuquerque. email: nfal.albuquerque@gmail.com. Serviço MFR, Hospital de S. Teotónio, Av. Rei D. Duarte, 3504-509 Viseu.

Data de submissão: junho 2019

Data de aceitação: maio 2021

Data de publicação: Junho 2021

Introduction

Peripheral mononeuropathies are one of the leading causes of access to health care because they are a frequent cause of lower extremity pain.¹ Signs and symptoms suggestive of nerve entrapment include anesthesia, dysesthesias, paresthesias, or weakness in the distribution of a peripheral nerve. The physical examination may reveal an abnormal neurologic examination finding in the distribution of a peripheral nerve, positive nerve provocative testing, and positive Tinel sign over the area of entrapment.¹⁻³

This case report aims to make known an unusual anatomical nervous variant, as well as a not infrequent cause of nerve trauma, such as the use of compression elastic stockings. It was a challenge for the clinicians who approached it, and it also proves that not only small details brought by a careful anamnesis can make the difference, but also how useful it is to combine physical examination with on time ultrasound scan, so as to reach a final diagnosis.

Case Report

A 70-year-old woman, merchant, still professionally active, with a medical history of hypertension, type 2 diabetes and dyslipidemia, started a non-specific pain in the popliteal region (4/10 on the Visual Analogue Scale (VAS), which seemed to worsen with physical activity (6/10 on the VAS), starting about two weeks before the family doctor's appointment. With the intensification of the pain, she went to her family doctor, who, suspecting of a possible Baker's cyst, prescribed a nonsteroidal anti-inflammatory drug (NSAID) and advised her to rest and try to ease the pain with ice for one week.

Without improvement of the complaints, the condition was only worsening and ended up associated with low back pain, which led the patient to the emergency room, where she was observed in Orthopedics. She performed aradiography of the lumbar spine, which showed degenerative signs of the latter and a rectification of lumbar lordosis. She had intravenous medication in the emergency room, such as muscle relaxants and anti-inflammatory drugs, and was discharged with diazepam 10 mg once a day, tramadol + paracetamol 37.5 / 325 mg twice a day, tizanidine 2 mg once a day and metamizole 575 mg until three times a day if the previously prescribed drugs were not enough. Furthermore, she was referred to her family doctor for further study of a possible herniated disc / radiculopathy.

After 10 days of medication, the patient maintained pain, which started to irradiate to the lower left limb, with the greatest intensity at the level of the popliteal fossa. However, she also referred irradiation to the posterior muscles of the

leg and to the internal malleolus. With marked claudication, the patient decided to go to the Physical Medicine and Rehabilitation (PMR) department to be observed.

In the anamnesis, the patient reported that she was going through a period of greater physical demands with many hours in orthostatic position due to her work and that she had decided to start using elastic stockings for greater rest of the lower limbs. She added that long periods in a sitting position, such as riding a car for more than an hour, also led to increased pain. When questioned, she also mentioned that the pain sometimes had neuropathic characteristics, with paresthesias along the posterior face of the leg.

On examination, the patient was conscious, oriented and cooperative, with no signs of dyspnoea with a FiO₂ 21%, no pain in the mobilization of the hip joints, negative sacroiliac joint manoeuvres and negative Lasègue's sign. In addition, flexion adduction and internal rotation (FAIR) left test was negative but causing discomfort compared to the contralateral. The patient had no pain on palpation of the great trochanters, no joint effusion in the knees or edema in the lower limbs. There were no signs of deep venous thrombosis, only small signs of chronic venous insufficiency. On palpation of the left piriformis, she presented evident contracture of this muscle in comparison to the contralateral, and intense pain in the palpation of the semitendinosus and semimembranosus tendons. The rotulian and aquilian reflexes were slightly diminished but symmetrical, the muscle strength was 5/5 on the Medical Research Council scale (MRC) in the various tested segments of the lower limbs. Skin sensation of the left leg's medial aspect following light touching was reported as different from the contralateral leg.

Towards this clinical case, there was suspicion of possible piriformis syndrome. Therefore, an electro-acupuncture session was performed with the intention of promoting muscle relaxation, which was performed and relieved pain in this region. When performing the bed lift to the sitting position, the patient also complained of pain in the popliteal fossa.

It was decided to make an ultrasound scan of the popliteal region. Baker's cysts, signs of tendinopathy/tendinosis, muscle ruptures and/or anomalous masses were not found during the sonography; however, it was verified that the intense pain of this region was triggered when the ultrasound probe pressed the tibial nerve, which was very superficial, making a slight protuberance of the surface of the skin near the lateral border of the semitendinosus muscle (probably a variant of the normal). This nerve had an increased dimension in comparison to the contralateral one. The patient was also found to have positive Tinel's sign in this region (Fig. 1).

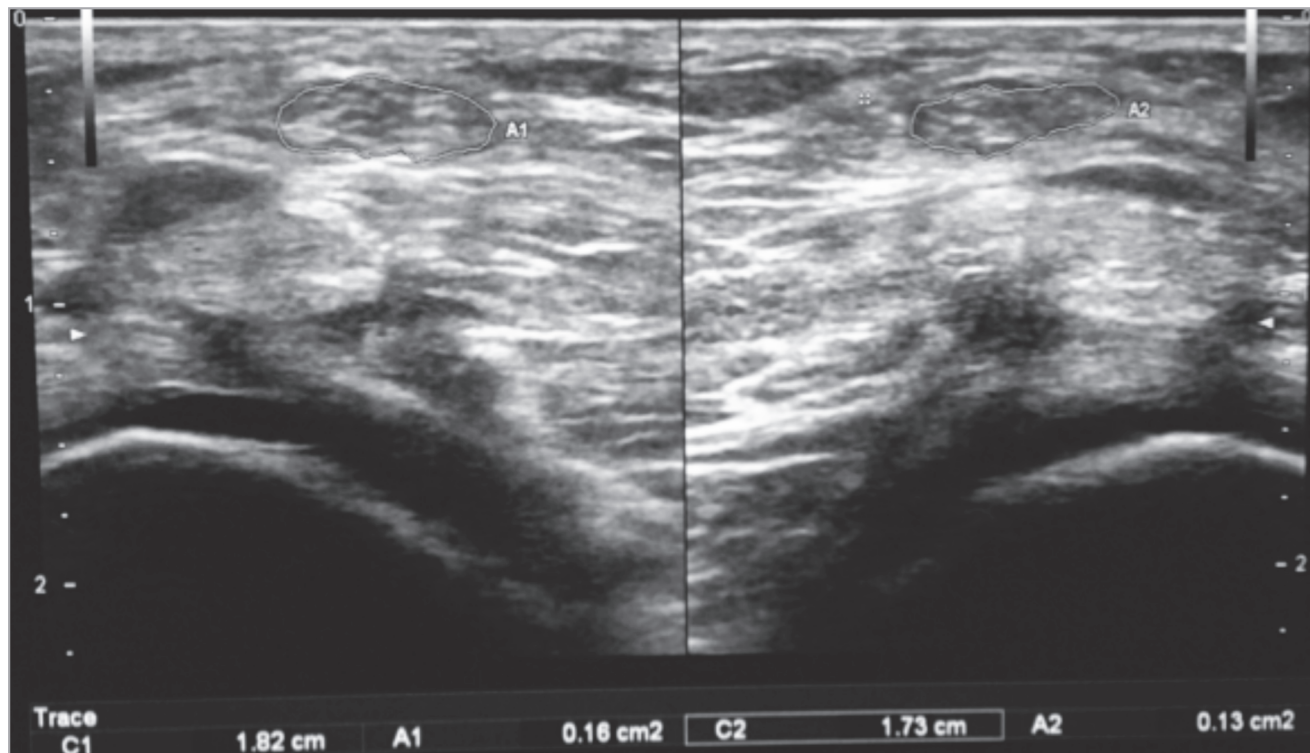


Figure 1 - Shows the left tibial nerve after injection with lidocaine (A1) and the right tibial nerve (A2). At the bottom both medial femoral condyles are visible.

After being questioned, the patient reported that for the past two months she had been using elastic stockings up to the knee region and that they had an upper strong elastic in that region. After reflecting on the issue, the patient reported that it was about two weeks after the start of wearing the socks that the painful condition started.

A nerve block was performed with 1.5 cc of 1% lidocaine, which led to a successful regression of all the symptomatology referred by the patient.

The final diagnosis of tibial nerve injury caused by below-knee compression stocking lesion was achieved.

After six months, the patient went to a second appointment in the PMR department. She was medicated with 1000 mg of bioflavonoids by her family doctor, and was not wearing elastic stockings. As she was in a less demanding work phase, she had no complaints of edema and she no longer felt pain in the posterior aspect of her leg. The manoeuvres to search for piriformis syndrome were negative, palpation was asymptomatic and the Tinel's test of the tibial nerve was negative. The remaining neurological examination of the lower limbs was normal.

Discussion

The great majority of nerve damage causes are traumatic and / or compressive, and can be divided in neuropraxias, axonotmesis or neurotmesis.²

With regard to trauma, peripheral nerve injuries often represent one of the most serious long-term sequelae affecting quality of life and cause disability.³

The diagnosis of nerve injury may be evident by painful complaints, paresthesias, local hypersensitivity, lack of strength (and sometimes atrophy) by the muscles enervated by it, and sensitivity deficits.

Compression mononeuropathies can be caused by internal compression (e.g., ganglia, lipomas or other tumors), or by external compression or trauma.^{1,2}

Compressive neuropathies are the consequence of ischemia and demyelination of the nerve by prolonged compression in time, which usually leads to a decrease of the speed of nerve conduction, being able to evolve to an axonal injury.⁴

Nerves that innervate the lower limbs arise from the lumbosacral plexus, formed by the nerve roots L2-S2.^{2,5}

The tibial nerve in particular derives from the division of the sciatic nerve and is formed by the nerve roots of L5-S2, innervating all hamstring muscles except for the short head of the femoral biceps. It also provides partial innervation to the adductor magnus. Inside the popliteal fossa, it contributes to the sural nerve and innervates the muscles of the posterior compartment of the leg.^{2,5,6}

The diagnosis and location of peripheral nerve lesions depend mainly on the clinical history and a careful physical examination.⁷

In this case report, multiple differential diagnoses could have been placed *ab initio* from musculoskeletal pathology (e.g. tendinopathy or rupture of semitendinosus, semimembranosus or gastrocnemius, baker cyst or compartment syndrome), neurological (ex: peroneal nerve entrapment), vascular (e.g. thrombophlebitis), among others (e.g. lipoma).

It should be noted that, in this case, high-resolution ultrasound proved to be a useful tool in the diagnosis of nerve damage. Ultrasound can easily identify all major nerve trunks running in the limbs, including the median, ulnar and radial nerves in the upper limbs and the sciatic, common peroneal and tibial nerves in the lower limbs. The literature review shows that the ultrasound is successful, demonstrating complete or partial lesions, nervous lacerations, epineural hematomas and neuromas.⁸⁻¹¹ Along with the clinical condition of neuropathy, the aforementioned patient developed a clinical condition of piriformis syndrome, probably triggered by the pattern of antalgic gait that she adopted due to the complaints she had.^{2,12-14}

The electromyography was not performed, since the diagnosis was evident and the lidocaine therapeutic test confirmed the suspicions.

Tibial nerve lesions tend to be uncommon at the knee level as opposed to peroneal nerves lesions, since they are found in a relatively deep region. In this patient's case, after bifurcation of the sciatic nerve in the tibial and common peroneal, the nerve turned more superficial, which allowed it to be palpable in the skin surface.^{2,4,5} On the other hand, tibial nerve entrapment at the ankle level is much more

frequent, particularly when passing through the tarsal tunnel.^{1,2} Skin sensation in the foot area is often altered once tibial nerve entrapment occurs. Therefore, evaluation of skin sensation of the lower leg and foot using a swab or pinching is crucial for the detection of tibial nerve entrapment syndromes.^{1,2}

A precise final diagnosis could have been made using electromyography, where a reduction in the velocity and/or amplitude of the action/sensory potential would be observed.²

It should be noted that, in this case, there were several factors contributing to the symptoms felt by the patient: first, the mechanical factor of compression elastic stockings on the tibial nerve; second, the characteristics of the antalgic gait and the stances adopted to alleviate the pain by the patient, which was probably the activator factor of the piriformis muscle, leading to its hyperactivity, consequently exacerbating and perpetuating the neuropathic pain of the patient; and finally the predisposition of the nerve to injury, either by its anatomical variation or by type 2 diabetes mellitus the patient presents. In fact, as we know, diabetes mellitus promotes the emergence of peripheral neuropathies by dysfunction of the mitochondria and endoplasmic reticulum, hypercholesterolemia, endothelial dysfunction and ischemia, contributing to edema and loss in neural elasticity, and leading to changes in the conduction of nerve impulses and a greater propensity to compression in specific anatomical sites.¹⁵

The most recent routine use of soft tissue ultrasound in the context of a PMR appointment is, in fact, an advantage in the practice of these specialists because it not only helps in the diagnosis but also the intervention techniques. Within its multiple advantages, the following stand out: being convenient, non-invasive, repeatable, providing dynamic imaging, inexpensive and not requiring any exposure to radiation.³

PMR specialists sometimes have to deal with anatomical variations, which that greatly confuses and delays the final diagnosis. Apart from this, the presence of other confounding factors is frequent, which makes this particular case report even more complex, requiring a methodological escalation so as to reach the final diagnosis.

Conflitos de Interesse: Os autores declaram a inexistência de conflitos de interesse na realização do presente trabalho. Fontes de Financiamento: Não existiram fontes externas de financiamento para a realização deste artigo. Confidencialidade dos Dados: Os autores declaram ter seguido os protocolos da sua instituição acerca da publicação dos dados de doentes. Consentimento: Consentimento do doente para publicação obtido. Proveniência e Revisão por Pares: Não comissionado; revisão externa por pares.

Conflicts of Interest: The authors have no conflicts of interest to declare. Financing Support: This work has not received any contribution, grant or scholarship. Confidentiality of Data: The authors declare that they have followed the protocols of their work center on the publication of data from patients. Patient Consent: Consent for publication was obtained. Provenance and Peer Review: Not commissioned; externally peer reviewed.

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