

# Bilateral Peroneal Nerve Palsy in a Floor Tile Worker Following Prolonged Squatting

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## Abstract

Peroneal neuropathy is the most prevalent compressive neuropathy of the lower extremity and may result from prolonged squatting. However, bilateral peroneal nerve paralysis following prolonged squatting is uncommon. Squatting-induced CPN neuropathy in the workplace has been reported in agricultural workers, sewer pipe workers, and harvesting farm workers, but little is known about this type of neuropathy in other professions. In this report, we present a floor tile worker with a history of prolonged squatting for a period of 6–7 hours over 2 months who developed bilateral numbness and weakness in the lower legs due to a bilateral peroneal nerve injury. Two months after the cessation of work and physiotherapy, his symptoms and neurophysiological abnormalities had resolved completely. Avoiding squatting for a long time, especially in small spaces, and stretching the knee and the knee muscles are very effective in preventing this neuropathy in workers.

**Keywords:** Floor Tile; Peroneal Nerve; Palsy; Squatting; Worker.

## Introduction

The most prevalent entrapment neuropathy in the lower extremity is common peroneal nerve neuropathy.<sup>1</sup> The peroneal nerve passes superficially through the fibula head, and this area is extremely vulnerable to damage and compression.<sup>2</sup> Trauma, surgery, or postural compression of the peroneal nerve near the head of the fibula are major causes of acute peroneal nerve damage. There are very few non-traumatic causes, such as tumors, intraneural ganglions, hemorrhages, or cysts.<sup>1,3</sup> Systemic disease (DM), crossing of the legs, sitting and lying down, sitting with one foot tucked under the other leg, and wearing tight clothes increase the risk of nerve palsy.<sup>4-6</sup> Another factor contributing to CPN compression neuropathy is prolonged squatting.<sup>7,8</sup> However, bilateral peroneal nerve paralysis following prolonged squatting is uncommon.<sup>5,7,9,10</sup> Squatting-induced CPN neuropathy in the workplace has been reported in agricultural workers,<sup>11,12</sup> sewer pipe workers,<sup>10</sup> and harvesting farm workers,<sup>13-15</sup> but little is known about this type of neuropathy in other professions. In this report, we present a floor tile worker with a history of prolonged squatting who developed bilateral numbness and weakness in the lower legs due to a bilateral peroneal nerve injury.

## Case Report

A 27-year-old male patient presented to our outpatient clinic complaining of tingling and numbness in the lower legs and tops of both feet. He also complained of weakness in the legs. The history taken indicated that he was a floor tile worker and had performed squatting for 6–7 hours, 2 months before the presentation. He did not have any problems (diabetes mellitus) in his past medical history, and he had never been exposed to toxins before. Height and weight were 180 cm and 76 kg, respectively. The systemic examination was normal. On neurological examination, the patient had numbness down the leg to below the knee on both sides with no urinary or fecal incontinence. Muscle examination showed decreased dorsiflexion of the ankle and extensor hallucis longus (EHL) muscle strength of 3/5 and 3/5 on the right and left sides, respectively. We referred him to an orthopedic specialist for consultation. Blood laboratory tests

and radiologic (MRI) scans of the knee and thoracolumbar region were both normal [Figures 1, 2, and 3]. EMG revealed an impression of a subacute-stage peroneal nerve lesion located 4 cm proximal to the fibular head on the right and left sides [Figures 4 and 5]. Based on these clinical and EMG findings, the patient was diagnosed as having bilateral peroneal nerve paralysis, was initiated on steroid and physical therapy, and was removed from work. A spring ankle foot orthosis was prescribed to support the DF of the feet. Physical therapy includes stretching, balancing, mobilization, and strengthening exercises. At the end of the 8-week therapy, the patient had EHL muscle strength of 5/5 on the right and left sides.



Figure 1



Figure 2

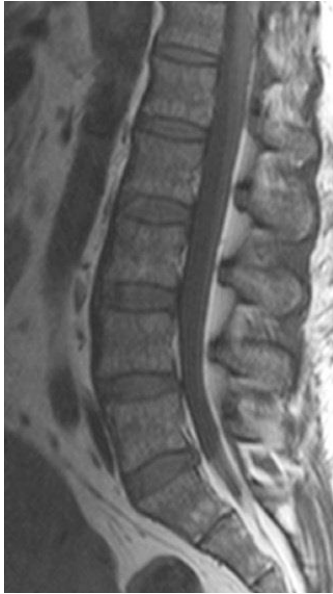


Figure 3



Figure 4

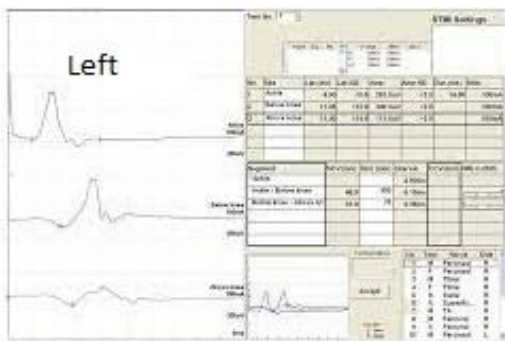


Figure 5

## Discussion

Peroneal neuropathy, also known as fibular neuropathy, is the most prevalent compressive neuropathy of the lower extremity and the third most prevalent focal neuropathy overall. Although peroneal nerve entrapment can happen in the calf, ankle, or foot, it most frequently occurs at or around the fibular head.<sup>16</sup> Ankle dorsiflexion weakness, great toe extension weakness, foot eversion weakness, sensory loss on the dorsum of the foot, foot drop, and steppage gait are all symptoms of CPN neuropathy.<sup>17</sup> In our patient, the mean daily squat time was 6 hours, and the symptoms started gradually on the third day of activity. Like our study, in the study conducted by Sipahiolu et al. on 16 seasonal farm workers with CPN palsy, the mean daily squat time was 6.8 h, and symptoms developed within 1 to 6 weeks after working.<sup>15</sup> Also in the study conducted by M. Kodaira et al on a sewer pipe worker, the mean daily squat posture the mean daily squat posture was 6 h in a narrow sewer pipe.<sup>10</sup>

But in the study of M. et al. on 3 agricultural workers, the mean daily squat time was less than our study of 4-5 h.<sup>11</sup> In the study by Rydevik et al.,<sup>18</sup> the symptoms appear after 2 h of nerve compression but resolve within 2 h. In wide workspaces, such as on a farm, workers can stretch their legs alternately to take pressure off the nerves,<sup>15</sup> but in confined spaces such as tile and sewer pipes, Workers are not able to stretch their legs sufficiently in a confined space. Therefore, they are more likely to develop squatting-induced CPN palsy than those working in a wider space. Following extra neural pressures, intra-neurological microvascular blood flow, axonal transport and, nerve function is disrupted within minutes or hours.<sup>19</sup> The first line of treatment in these patients is usually a non-surgical treatment that involves the use of the brace, lifestyle modification, removing activities that may be causing external compression,<sup>20,21</sup> and steroid therapy.<sup>11</sup> It is very important to eliminate the causative factor in the early stages of paralysis because long-term and repeated pressure from CPN can cause irreversible degeneration of the axon, which is called Waller's degeneration, and in such cases, surgical treatment is recommended.<sup>17</sup> Eliminating any risk of external compression, stabilizing any potential instability joints that may be adding pressure on the nerve, and reducing inflammation are typically the first lines of treatment.<sup>21</sup> In tiling, workers are constantly squatting, and this activity causes damage and pressure on the nerve. To complete the treatment process, the patient was removed from the work environment. Peroneal nerve injury is a preventable occupational disease that occurs in jobs that require frequent squatting and may cause permanent disability in workers. Avoiding squatting for a long time, especially in small spaces, and stretching the knee and stretching the knee muscles are very effective in preventing it. Therefore, training young workers with little work experience in such jobs can prevent the development of this complication and its spread.

## Disclosure

There is no Conflicts of Interest. A written consent given by the patient.

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