

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

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## ARTICLE INFO

### Article history:

Received: 29 July 2023

Accepted: 6 September 2023

### Online:

DOI 10.5001/omj.2025.25

### Keywords:

Peroneal Nerve; Paralysis;  
Posture; Work.

## ABSTRACT

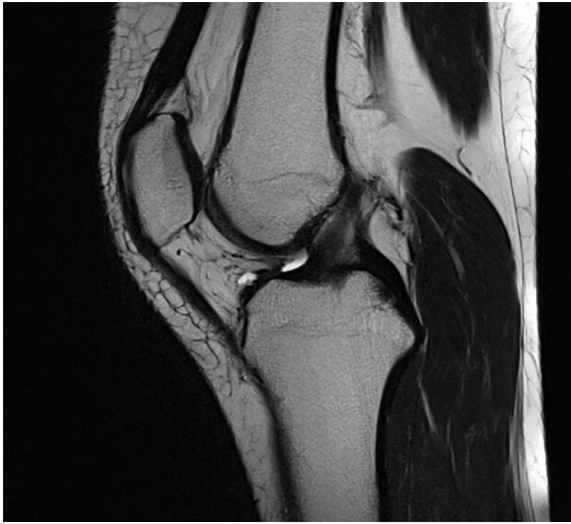
Peroneal neuropathy is the most prevalent compressive neuropathy of the lower extremity and may result from prolonged squatting. However, bilateral peroneal nerve paralysis following prolonged squatting is uncommon. Squatting-induced common peroneal nerve neuropathy in the workplace has been reported among 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 case of a floor tile worker who, after prolonged squatting for 6–7 hours over two months, developed bilateral lower-leg numbness and weakness due to a bilateral peroneal nerve injury. Two months after cessation of work and physiotherapy, his symptoms and neurophysiological abnormalities had completely resolved. Avoiding prolonged squatting, especially in small spaces, and incorporating knee and knee muscle stretching exercises are highly effective in preventing this neuropathy in workers.

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 diseases like diabetes mellitus (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 common peroneal nerve (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 with tingling and numbness in the lower legs and tops of both feet. He also complained of weakness in the legs. The history indicated that he was a floor tile worker and had performed squatting for 6–7 hours, two months before the presentation. He did not have history of DM or exposure to toxins. His 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 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 radiological scans of the knee and thoracolumbar region were both normal [Figures 1, 2, and 3]. An electromyography revealed an impression of a subacute-stage peroneal nerve lesion located 4 cm proximal to the fibular head on the right and left sides. Based on these clinical and electromyography findings, the patient was diagnosed as having bilateral peroneal nerve paralysis. He was initiated on steroid and physical therapy, and removed from work. A spring-ankle foot orthosis was prescribed

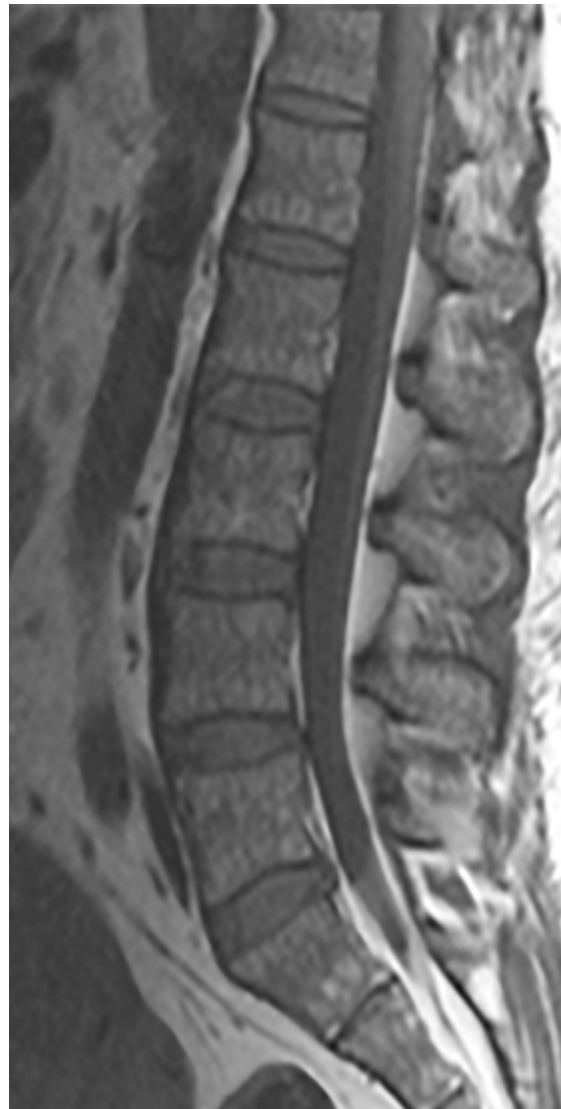
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**Figure 1:** Normal appearing right knee on MRI.



**Figure 2:** Normal appearing left knee on MRI.



**Figure 3:** Lumbosacral region, which appears normal on MRI.

to support dorsiflexion of the feet. Physical therapy included stretching, balancing, mobilization, and strengthening exercises. At the end of the eight-week therapy, the patient had extensor hallucis longus muscle strength of 5/5 bilaterally. A written consent was obtained from the patient.

### 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 occur in the calf, ankle, or foot, it most frequently occurs at or around the fibular head.<sup>16</sup> Symptoms of CPN neuropathy

include ankle dorsiflexion weakness, great toe extension weakness, foot eversion weakness, sensory loss on the dorsum of the foot, foot drop, and steppage gait.<sup>17</sup> In our patient, the mean daily squat time was six hours, and the symptoms started gradually on the third day of activity. Similar to our study, Sipahioğlu et al,<sup>15</sup> found in their study of 16 seasonal farm workers with CPN palsy that the mean daily squat time was 6.8 hours, and symptoms developed within 1–6 weeks after working. Also, in the study conducted by Kodaira et al,<sup>10</sup> on a sewer pipe worker, the mean daily squat posture was 6 hours in a narrow sewer pipe. However, in the study by Tuna et al,<sup>11</sup> on three agricultural workers, the mean daily squat time was less than our study at 4–5 hours. In the study by Rydevik et al.,<sup>18</sup> the symptoms

appeared after two hours of nerve compression but resolved within 2 hours. In wide workspaces, such as on a farm, workers can stretch their legs alternately to relieve nerve pressure,<sup>15</sup> but in confined spaces, such as tile and sewer pipes, workers are unable to stretch their legs sufficiently, making them more prone to developing squatting-induced CPN palsy. Following additional neural pressures, intra-neurological microvascular blood flow, axonal transport, and nerve function are disrupted within minutes to hours.<sup>19</sup> The first line of treatment in these patients is usually non-surgical and involves the use of the brace, lifestyle modification, removing activities causing external compression,<sup>20,21</sup> and steroid therapy.<sup>11</sup> It is crucial 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 unstable 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, causing damage and pressure on the nerve. To complete the treatment process, the patient was removed from the work environment.

## CONCLUSION

Peroneal nerve injury is a preventable occupational disease that occurs in jobs requiring frequent squatting and may cause permanent disability in workers. Avoiding prolonged squatting, especially in small spaces, and incorporating knee and knee muscle stretching exercises are highly effective in preventing it. Therefore, educating young workers with little work experience in such jobs can prevent the development and spread of this complication.

### Disclosure

The authors declare no conflicts of interest.

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