Case Report

Bilateral Peroneal Nerve Injury Related to Pneumatic Distention

Metin ORAKDÖĞEN¹, Necat BIBER¹, Şevki GÖK², Onur YÜKSEL¹, Hakan SOMAY¹

¹Haydarpaşa Numune Training and Research Hospital, Neurosurgery, İstanbul, Turkey ²Kars State Hospital, Neurosurgery, Kars, Turkey

Summary

Peroneal nerve injury is the most commonly seen peripheral entrapment neuropathy of the lower extremities. Peroneal nerve can be exposed to pressure applied by the mechanical external forces while turning around the head of fibula at the backside of it, on the way to down. A case of bilateral peroneal nerve injury which happened due to pneumatic distention after the operation of cerebral aneurysm is presented. The possibility of compressing the peroneal nerve at the head of fibula should be considered when applying pneumatic devices in Intensive Care Units to unconscious patients.

Key words: Dropped foot, non-traumatic, peroneal nerve, pneumatic distention

Pnömatik Distansiyona Bağlı Bilateral Peroneal Sinir Hasarı

Özet


Anahtar Kelimeler: Düüşük ayak, nontravmatik, peroneal sinir, pnömatik distansiyon

INTRODUCTION

External noninvasive compressive devices are being used more frequently than before. Application of these devices is easy. As they are noninvasive the possibility of the complications are rare. Due to low complication rates they are becoming popular. The intermittent pneumatic compression device (IPCD) is used for prevention of deep-venous thrombosis (DVT). This pneumatic leg sleeve has been used extensively in high-risk surgical patients and complications are rarely seen. External or internal pressures on peripheral nerves may result in compression neuropathies. Although compressive common peroneal nerve palsy is well known, to date very few cases with bilateral palsies have been reported. Our case report is a sample of this kind of rarely seen bilateral peroneal nerve injury related to intermittent pneumatic distention.

CASE PRESENTATION

Sixteen years old patient was admitted to the hospital with seizure. He did neither
have a trauma history nor symptom of it. The results of the hematological and biochemical laboratory investigations were in normal limits. Cranial computerized tomography (CT) revealed extensive subarachnoid hemorrhage (Figure 1a). An aneurysm at the bifurcation of left internal carotid artery (ICA) was detected by CT-Angiogram (Figure 1b). The patient was operated and as the intensive care needed, he transferred to the intensive care unit (ICU). In the intensive care unit period, the pneumatic trousers which had compression cycle of 11 seconds and 40 seconds of decompression with 45 mmHg pressure at the leg sleeves were applied to both legs in order to prevent thromboembolism. The neurological examination when he was transferred from the ICU was as follows: The patient was conscious, fully cooperated and orientated, all components of the sensations were normal, deep tendon reflexes were normo-active, balance and coordination tests were in normal limits, sphincter functions were normal. Glasgow Coma Scale (GCS) was 15, cranial nerve examination didn't reveal any pathological signs, cerebellar functions intact, muscle power at dorsiflexion at the right ankle 0/5, at the left ankle 1/5. Any ischemic finding was detected at the control cranial CT (Figure 1c). As it was known that pneumatic trousers were performed to the patient in ICU, peroneal nerve neuropathy was suspected (Figure 1d). Electrophysiologic studies of the lower extremities were done twice. Motor nerve conduction studies recording at the extensor digitorum brevis (EDB) showed no response bilaterally, CMAPs couldn't be recorded. At the right side, recording at the tibialis anterior low amplitude CMAP was recorded at the head of fibula but CMAP couldn't be recorded when stimulus applied at the poplitea. At the left side, low amplitude CMAP was recorded at the tibialis anterior muscle. The nerve conduction studies of the other nerves were in normal limits. Needle EMG performed. At the right tibialis anterior muscle volunteered muscle contraction couldn't be seen and active denervation signs were not detected. At the left tibialis anterior muscle, volunteered muscle contraction was seen and active denervation signs were not detected. Electrophysiologic findings at the other nerves of both sides were in normal limits. According to the electrophysiologic findings it was concluded that peroneal nerves have axonal lesions bilaterally, after giving branch to the short head of biceps femoris muscle. The patient was taken into the physiotherapy program and then the neurological deficits were observed to be improved. When electrophysiologic study was done for the second time, 5 months later, no CMAPs were recorded at EDB muscle bilaterally, but CMAP amplitudes were better when recording at the tibialis anterior muscle bilaterally. Stimulation at the poplitea, revealed a low amplitude CMAP. In the needle EMG findings there was volunteered muscle contraction at the right tibialis anterior muscle. It was interpreted that the electrophysiologic findings are in correlation with the improvement seen clinically.
DISCUSSION

In clinical routine it is common to see unilateral peroneal nerve paralysis. Bilateral peroneal nerve injuries are rare\(^3\). Etiology is multifactorial. In bilateral peroneal nerve injuries it is essential to compress both legs at the same time. Bilateral peroneal nerve injuries were reported after the skeletal traction, bilateral femur fractures, prolonged crouching, external pressure bandages and pelvic injuries\(^1,8,9\). In patients with diabetes or malignancy, application of pneumatic distention can cause peroneal nerve injury\(^4\). Bilateral peroneal nerve injury was also reported after severe weight losses\(^6,7\). In literature there are two case reports regarding to patients with total hip arthroplasty and intermittent pneumatic distention device usage\(^5\). In prolonged usage of the device injury is suspected to be a result of the pressure that the nerve is exposed to rather than placement of the device\(^6\).

As a result although the intermittent pneumatic device usage increases the risk of peroneal nerve injury, bilateral peroneal nerve injuries are rarely observed\(^2\). It is supposed to be due to pressure compressing the nerve at the head of fibula\(^2,4\). Especially in the unconscious patients whom the pneumatic distention is performed it is needed to be sure of not applying external pressure at the head of fibula.

Figure 1: a: Subarachnoid hemorrhage, b: CT angiogram, c: Postoperative cranial CT, d: Pneumatic trousers
REFERENCES