



OLGU

Successful treatment of complex regional pain syndrome Type I using intravenous regional anesthesia

Tıp I bölgesel ağrı sendromunun intravenöz anestezi ile başarılı tedavisi

Mahmut Yener¹, Erdem İlgun², Selami Akkus³

¹Suleyman Demirel University Faculty of Medicine, Physical Medicine and Rehabilitation Department, Isparta, Turkey.

²Mevlana University Faculty of Medicine, Physical Medicine and Rehabilitation Department, Konya, Turkey.

³Yildirim Beyazıt Universty Faculty Of Medicine, Physical Medicine And Rehabilitation Department, Ankara, Turkey.

Abstract

Electrical burn injuries affect many tissues including blood vessels, muscles, nerves, tendons, bone and skin. Complex Regional Pain Syndrome Type I (CRPS Type I) is defined as a post-traumatic pain syndrome presenting with spontaneous pain. There are a few case reports in the literature about CRPS Type I following electrical injury. Some therapeutic approaches including use of adrenergic agents, anticonvulsants, steroids and tricyclic antidepressant drugs, and sympathetic blockade are recommended for neuropathic pain; however, there has been no standard therapy in this syndrome. Herein, we presented a case of CRPS Type I following electrical injury, which was treated successfully by intravenous regional anesthesia.

Özet

Elektrik çarpması sonucu kan damarları, kaslar, sinirler, tendonlar, kemik yapılar ve deri gibi birçok organ etkilenebilir. Tıp I Kompleks Bölgesel Ağrı Sendromu (KBAS Tıp I) spontan ağrı ile kendini gösteren bir post-travmatik ağrı sendromudur. Literatürde, elektrik çarpmasına bağlı KBAS Tıp I gelişen az sayıda olgu bildirilmiştir. Her ne kadar nöropatik ağrı için adrenerjik ajanların, antikonvülzan ilaçların, steroidlerin, trisiklik antidepresanların kullanımı ve sempatik blok yapma gibi bazı tedavi metotları önerilse de bu hastalık tablosunun standart bir tedavisi yoktur. Burada, elektrik çarpmasına bağlı KBAS Tıp I gelişen ve intravenöz bölgesel anestezi ile başarılı bir şekilde tedavi edilen bir olgu sunduk.

Introduction

Electrical burn injuries affect a lot of tissues including blood vessels, muscles, nerves, tendons, bone and skin (1). The spectrum of neurological sequellae following burn injury includes cerebral injury, spinal cord lesions, and peripheral sensory and motor neuropathies (2). However, there are a few case reports in the literature about Complex Regional Pain Syndrome Type I (CRPS Type I) (3). CRPS Type I is defined as a post-traumatic pain syndrome, which presents with spontaneous pain. The syndrome is not related to the territory of a single nerve, and its severity is not compatible with degree of the event (4). The disabling nature of the disease and severity of pain during its course indicate the judgement of physician to initiate the treatment. The principal targets of therapy are analgesia and preservation of function (5). Although some therapeutic approaches including use of adrenergic agents, anticonvulsants, steroids and tricyclic antidepressant drugs, and sympathetic blockade are recommended for neuropathic pain, there has been no standard therapy in this syndrome (6). We reported a case of CRPS Type I following electrical burn injury, which was treated effectively by intravenous regional anesthesia (IVRA).

Case Report

A 13-year-old girl presented with severe pain on right upper extremity. About 1.5 months ago she had experienced an electrical injury causing functional loss and hiperalgesia. She had a history of epilepsy for 8 years, and had been on carbamazepine as an antiepileptic treatment. Physical examination revealed limitation of range of motion and pain in the right shoulder. There was periarticular sensitivity. ROM was also limited and painful in right elbow and wrist. The signs of Phalen and Tinel were negative. On neurological examination, there were no consciousness, orientation and cooperation problems. The proximal muscle strength was 3/5 and the distal was 2/5 on upper right extremity. Deep tendon reflex was normoactive. She had no pathological reflex and spasticity. There was widespread hyperalgesia particularly on the top of right hand and wrist, and edema on the right hand. Neuropathic pain scale was 76. About 6 cc difference of edema in volumetric measurement and thermal difference were determined between the hands. There was periarticular osteoporosis determined by X-Ray. Cervical spine x-rays were normal, and there was no abnormality in EMG, blood chemistry analyses including CPK, Ca, P, ALP, SGOT, CBC, and urinalysis.

As she had been taking an oral antiepileptic treatment since 2003, we did not administer any antiepileptic drug. For her pain amitriptyline, tricyclic antidepressant, was prescribed.

In addition, transcutaneous electrical nerve stimulation (TENS), whirlpool, passive and active ROM exercises were applied as physical therapy. After two weeks of the treatment, clinical status did not resolve. Gabapentin administration was planned firstly; however, the patient had already been taking an antiepileptic treatment. Therefore, IVRA was considered to be more convenient and was applied once a week for three weeks. After the procedure, neuropathic pain scale was 17, proximal and the distal muscle strength tests were 4/5 and 3+/5, respectively. The clinical status recovered completely and after her complaints totally disappeared she was discharged from the hospital. Two months after discharged she had no symptoms and muscle strength was totally normal.

Discussion

Reflex sympathetic dystrophy is a well-documented phenomenon in electric burn victims (7). In pediatric patients, CRPS Type I has been considered different than in adults. Previous series of CRPS suggested that the syndrome was extremely rare in children (8). Some treatment strategies including sympathetic blocks, antidepressants, vasodilators and steroids can be chosen in adult patients (9). However, spontaneous resolution may occur in children (10). Therefore, no treatment was recommended for children, because the treatment strategies carry some risks and side effects (9). Conservative treatment including physical therapy either with (11-12) or without (13) concomitant use of TENS was recommended. TENS is a noninvasive physical modality and it may provide excellent analgesia. However, there were no randomized prospective clinical trials showing the efficacy of TENS on CRPS. In our case, 2 weeks therapy of TENS concomitant with the other physical therapy approaches did not show any beneficial effects on symptoms and signs. CRPS Type I and II are neuropathic pain syndromes and they are accompanied by sudomotor and vasomotor disturbances (14). Although the use of gabapentin has been gradually increased in the treatment of CRPS, there was no strong evidence suggesting the efficacy of gabapentin on CRPS. Recently, van de Vusse et al (15) reported that gabapentin had a mild effect on pain in CRPS I. In our case we did not use gabapentin because she had already been taking an antiepileptic drug which is also used for neuropathic pain. There is a limited data suggesting beneficial effects of IVRA with corticosteroid on CRPS Type I (16-18). Taskaynatan et al (19) reported that IVRA with methylprednisolone and lidocaine did not provide long-term beneficial effects on CRPS Type I, and their short-term benefit was not superior to placebo. We administered physical therapy and TENS for two weeks in our case. But, no recovery in the clinical symptoms and signs was recorded. Therefore, IVRA was applied for three weeks and physical therapy was continued. After three weeks of treatment, clinical symptoms and signs resolved completely. In conclusion, we presented a case of CRPS Type I following electrical burn injury that was successfully treated by IVRA. Randomized studies are needed to evaluate the effects of IVRA on CRPS Type I following electrical burn injury.

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