A Case with Isolated Injury of the Palmar Cutaneous Branch of the Median Nerve

Median Sinirin Palmar Kutanöz Dalının İzole Travmatik Lezyonu Bulunan Bir Olgu Sunumu

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ABSTRACT

We aimed to present a case with isolated traumatic injury of the palmar cutaneous branch of median nerve and review the literature in this article. A 45 year old woman who was injured with a knifepoint on her forearm and applied with the complaint of numbness of a small area in her hand was evaluated electrophysiologicaly and diagnosed with isolated total lesion of the palmar cutaneous branch of the median nerve.

Keywords: Palmar cutaneous, median nerve, rehabilitation, injury

ÖZET

Bu makalede median sinirin palmar kutanöz dalının travmatik izole yaralanması olan bir olguyu sunmayı ve literatürü gözden geçirmeyi amaçladık. Önkolundan bıçak ucu batması sonucu yaralanan ve elinde küçük bir alanda hissizlik şikayetiyle başvuran 45 yaşındaki kadın hastada elektrofizyolojik incelemeler yapıldı ve median sinirin palmar kutanöz dalının izole total lezyonu tanısı konuldu.

Anahtar sözcükler: Palmar kutanöz, median sinir, rehabilitasyon, yaralanma

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Received/Geliş Tarihi: 27.06.2013
Accepted/Kabul Tarihi: 24.09.2013

A 45 year old female patient applied with the complaint of anesthesia in her right thenar region from the moment that a knifepoint had pricked on her forearm two months ago. Her history revealed that she has not gone to a hospital because the wound size was small and no prolonged bleeding was existing. She said that the wound had healed spontaneously. There was a milimetric scar on radial side of the forearm about 5cm proximal to the proximal wrist crease (Figure 1). Motor examination of the median and ulnar nerve innervated muscles was normal, an area about 3x4 cm diameter on thenar region was anesthetic and sensation of the rest of the hand was normal. There were not symptoms related with polyneuropathy or radiculopathy. Electrophysiologic evaluation with the pre-diagnosis of median nerve lesion was done in our laboratory two months after the incident. Motor nerve conduction studies recorded from the abductor pollicis brevis muscle (APB) across wrist-elbow segment and needle electromyographic examination of the APB were normal. Sensory motor nerve conduction studies of the 1-5 digits across finger-wrist segment were also normal. Sensory nerve action potantial (SNAP) of the palmar cutaneous branch of the median nerve (PCBMN) could not be obtained on the affected side. However a SNAP with 49,5 m/s conduction velocity and 10 μV amplitude was recorded from the opposite hand. The conduction study of PCBMN was performed according to the technique described by Chang and Lien (1). (Figure 1) In this technique, the palmar cutaneous branch of median nerve is stimulated at the midportion of the

thenar eminence with surface electrodes. The active recording electrode is placed on the median nerve 10 cm proximal from the stimulating electrode. The authors recommend that the nerve conduction study of this nerve should be done with caution and requires more averaging. The stimulation intensity should be increased slowly but not to a supramaximal stimulation in order to prevent the stimulation of the main sensory branch of the median nerve. According to these findings, the diagnosis of the patient was reported as total lesion of the PCBMN. She had no paresthesia but numbness still persisted six months after the injury.

The PCBMN is the last branch given off by the main trunk of the median nerve in the forearm. It originates from the radial side of the median nerve on average 8.4 cm from the distal wrist crease. From its origin, the nerve courses distally along with the median nerve between the palmaris longus and flexor carpi radialis tendons. It pierces the antebrachial fascia near the distal wrist crease to enter a short tunnel (9-16 mm) formed in the mass of the transvers carpal ligament. It provides cutaneous sensation to the bases of the thenar and hypothenar eminencies as well as a small area of skin in the mid-palm region (2). (Figure 1).

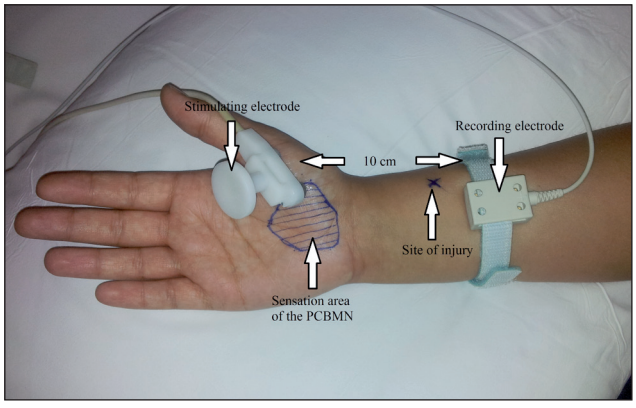

Figure 1. The innervation area and the conduction study technique of palmar cutaneous branch of median nerve.

Neuropathies of PCBMN due to compression of a ganglion and due to tumors like neurofibroma and granular cell tumor were reported in the literature (3-6). Traumatic injuries of this nerve are rare than compressive lesions. There is an article represents four cases with traumatic PCBMN injury. Similar to our case there were a history of a laceration on the antero-lateral segment of the forearm, 1-5 cm proximal to the wrist in all of the cases and the diagnosis' were confirmed by the neurophysiological findings. They reported that the lesions of all four cases were examined surgically, the continuity of the PCBMN were found normal whilst perineural haematoma was present in all of them. They also reported that the outcome was favourable after the neurolysis treatment (7). A surgical exploration was not done in our case. A case of median palmar cutaneous neuropathy likely the result of repetitive trauma occurring while playing competitive volleyball was also presented in the literature but SNAP's of the PCBMN were unobtainable bilaterally, the diagnosis could not been confirmed by electrophysiologically in this case (8). However most frequent cause of injuries of this branch is iatrogenic injuries during surgical releases for carpal tunnel syndrome, subsequently causing pain due to neuroma formation. Many patients complain of scar tenderness, pain or skin dysesthesias following the release of transverse carpal ligament for carpal tunnel syndrome . It was shown that these symptoms were due to injury of the PCBMN resulting in neuroma formation (9,10). Thus, this complication should be kept in mind and the patients with these complaints should consult with the surgeon in our daily practice. Entrapment neuropathy of the PCBMN concomitant with carpal tunnel syndrome were also reported (10,11) Wada stated that the diagnosis of this clinical situation is problematic because the exact sensory area of the PCBMN has not been described, the sensory distribution of the main median nerve and the PCBMN extensively overlap and this situation is mimicked by proximal median nerve compression (12). After reporting one of the cases, Imai et al. investigated the significance of electrophysiological evaluation of the PCBMN in the diagnosis of entrapment of the PCBMN concomitant with carpal tunnel syndrome. They concluded that although clinical symptoms were not always reliable to diagnose entrapment of these two nerves, electrophysiological study of the PCBMN was highly sensitive (%75) and entirely specific (%100) to demonstrate the entrapment of the PCBMN preoperatively (13). Therefore nerve conduction study of the PCBMN may be performed along with other electrophysiological tests in patients with suspected carpal tunnel syndrome. This enables us to lead the surgeon more accurately.

In conclusion, a problem related to palmar cutaneous branch of median nerve should be considered in the patients with complaints of numbness or paresthesies on their thenar region.

References

1. Chang CW, Lien IN. Comparison of sensory nerve conduction in the palmar cutaneous branch and first digital branch of the median nerve: a new diagnostic method for carpal tunnel syndrome. Muscle Nerve. 1991 Dec;14(12):1173-6.
2. Daniel Dumitru, Michael J. Zwarts. Focal peripheral neuropathies. In: Daniel Dumitru, Anthony A. Amato, Machiel Zwarts, editors. Electrodiagnostic medicine 2nd edition. Philadelphia: Hanley& Belfus Inc, 2002: 1043-1126.

3. al-Qattan MM, Robertson GA. Entrapment neuropathy of the palmar cutaneous nerve within its tunnel. J Hand Surg Br. 1993 Aug;18(4):465-6.

4. Haskin JS Jr. Ganglion-related compression neuropathy of the palmar cutaneous branch of the median nerve: a report of two cases. J Hand Surg Am. 1994 Sep;19(5):827-8.

5. Nagey L, McCabe SJ, Wolff TW. A case of neurofibroma of the palmar cutaneous branch of the median nerve. J Hand Surg Br. 1990 Nov;15(4):489-90.

6. Condit DP, Pochron MD. Granular cell tumor of the palmar cutaneous branch of the median nerve. J Hand Surg Am. 1991 Jan;16(1):71-5.

7. Pardal-Fernandez JM, Gracia-Rodriguez I, Iniesta-Lopez I, Rodriguez-Vazquez M. Posttraumatic neuropathy of the palmar cutaneous branch of the median nerve: four cases. Laceration or entrapment? Acta Neurochir (Wien). 2011 Mar;153(3):617-20.

8. Gitkind AI, Zhao P, Oh-Park MY, Fast A. Median palmar cutaneous nerve injury in a volleyball player. Am J Phys Med Rehabil. 2009 Apr;88(4):272-4.

9. MacDonald RI, Lichtman DM, Hanlon JJ, Wilson JN. Complications of surgical release for carpal tunnel syndrome. J Hand Surg Am. 1978 Jan;3(1):70-6.

10. Taleisnik J. The palmar cutaneous branch of the median nerve and the approach to the carpal tunnel. An anatomical study. J Bone Joint Surg Am. 1973 Sep;55(6):1212-7.

11. Shimizu K, Iwasaki R, Hoshikawa H, Yamamuro T. Entrapment neuropathy of the palmar cutaneous branch of the median nerve by the fascia of flexor digitorum superficialis. J Hand Surg Am. 1988 Jul;13(4):581-3.

12. Wada T, Imai T, Ishii S. Entrapment neuropathy of the palmar cutaneous branch of the median nerve concomitant with carpal tunnel syndrome: a case report. J Hand Surg Br. 2002 Dec;27(6):583-5.

13. Imai T, Wada T, Matsumoto H. Entrapment neuropathy of the palmar cutaneous branch of the median nerve in carpal tunnel syndrome. Clin Neurophysiol. 2004 Nov;115(11):2514-7.