OLGU SUNUMU CASE REPORT

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Sonographic Evidence of Cheiralgia Paresthetica

Cheiralgia Parestetikanın Sonografik Kanıtı

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ABSTRACT Cheiralgia paresthetica is the entrapment of the superficial branch of the radial nerve in the forearm. Although this nerve damage frequently occurs after direct trauma or compression, it may also be the result of repetitive forearm rotation movements. It occurs with symptoms such as pain, burning and tingling sensations in the distal forearm and hand. Electromyelography can be used for diagnosis. Ultrasound is a feasible method of showing nerve compression. Although treatment is mostly conservative, surgical exploration is an option for resistant cases. The case is here presented of a 46-year old female agricultural worker with compression of the superior branch of the radial nerve due to occupation-related repetitive forearm rotation.

Keywords: Cheiralgia paresthetica; radial nerve; forearm pain

ÖZET Cheiralgia parestetika, radiyal sinirin yüzeyel dalının ön kolda sıkışmasıdır. Bu sinir hasarı sıklıkla doğrudan travma veya kompresyon sonrası ortaya çıksa da tekrarlayan ön kol rotasyon hareketlerinin sonucu da olabilir. Hastalık distal ön kol ve elde ağrı, yanma ve karıncalanma hissi gibi bulgular ile ortaya çıkar. Tanıda elektromiyelografiden yararlanılabilir. Ultrason, sinir sıkışmasını göstermenin uygun bir yöntemidir. Tedavi çoğunlukla konservatif olmakla birlikte dirençli olgularda cerrahi eksplorasyon bir seçenektir. Burada, meslekle ilişkili tekrarlayan ön kol rotasyonu nedeniyle radiyal sinirin üst dalına bası olan 46 yaşında bir kadın tarım işçisi olgusu sunulmaktadır.

Anahtar Kelimeler: Cheiralgia parestetika; radiyal sinir; ön kol ağrısı

Cheiralgia paresthetica, also known as Wartenberg syndrome, is a compression of the superficial radial nerve (SRN) in the distal forearm.[1] The SRN is a purely sensory nerve with no motor component. It supplies the skin on the lateral two-thirds of the dorsum of the hand and proximal parts of the lateral three and a half digits.[2] SRN entrapment may be caused by compression or direct trauma at any point along the nerve course. It is often compressed by tight bands (bracelet, watchstrap etc.) or a mass (lipoma, ganglion cyst, etc.).[3] In addition, with excessive, repetitive and long-lasting rotation movements of the forearm, the nerve can become compressed between the brachioradialis and extensor carpi radialis longus muscles.

The annual incidence of radial nerve compression syndromes is 0.003%.[4] The incidence of cheiralgia paresthetica, which is a subgroup of radial nerve entrapments, is unknown.[5] Cheiralgia paresthetica presents with complaints of pain, burning and numbness in the dorsolateral part of the distal forearm and hand. Often it is aggravated by activities such as hand rotation, pinching, and gripping. In addition to sensory symptoms, if there are findings such as muscle weakness, alternative diagnoses where the lesion may originate more proximal should be considered. It can be confused with deQuervain tenosynovitis due to its localization in the differential diagnosis of the disease. Ultrasound is an important method in demonstrating nerve compression in this disease. The

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treatment of cheiralgia paresthetica is usually conservative (rest, splinting, nonsteroidal anti-inflammatory drugs and corticosteroid injection), but surgical exploration is an option for resistant cases.[6,7]

An uncommon case is here reported of SRN compression due to repetitive forearm rotation in a 46-year old female agricultural worker. It was diagnosed on the basis of clinical symptoms, physical examination, ultrasound and electromyography (EMG). To the best of our knowledge, SRN compression due to harvesting garlic has not been previously reported in the literature.

CASE REPORT

A 46-year old female presented with the complaint of right-side anterior forearm pain, which had begun 3 days previously when she started to work harvesting garlic. It was learned that the work involved intense supination-pronation movements of the arm. The patient described pain, burning and numbness over the dorsolateral aspect of the distal forearm and hand in the distribution of the SRN, and she had difficulty in forearm rotation and gripping movements. There was no history of trauma or systemic disease. The physical examination revealed mild tenderness with palpation on the dorsolateral distal forearm and the Tinel test was positive (Figure 1). The ranges of motion of the elbow, wrist and metacarpophalangeal joints were full. There was no motor weakness or signs of atrophy. EMG and nerve conduction studies were consistent with sensory radial neuropathy with no evidence of cervical radiculopathy (Table 1). In ultrasound imaging, in the area where the Tinel test and sonopalpation were most prominent, the diameter of the SRN was found to be larger than the same region of the other forearm (6 cm proximal to the radius styloid) (Figure 2). The patient was advised to rest and use a non-steroidal anti-inflammatory drug (acemetazine 60 m, twice daily). At the follow-up examination after 10 days, the patient's complaints and examination findings had decreased significantly. Informed consent was obtained from the patient.

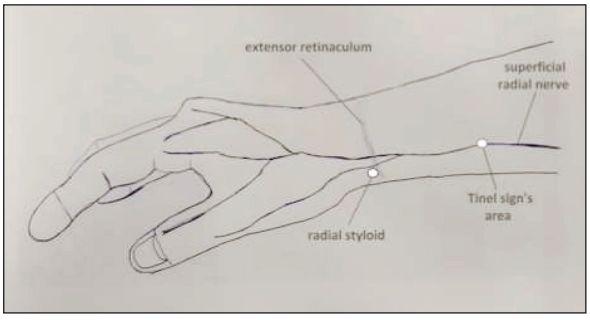

FIGURE 1: The route of the superficial radial nerve at the wrist.

TABLE 1: Superficial radial nerve sensory conduction study parameters.

	Right-side	Left-side
SNAP CV (m/s)	41.6	51.5
SNAP amplitude (μV)	12.2	26.3

SNAP: Sensory nerve action potential; CV: Conduction velocity; m/s: Meter per second; μV: Microvolt.

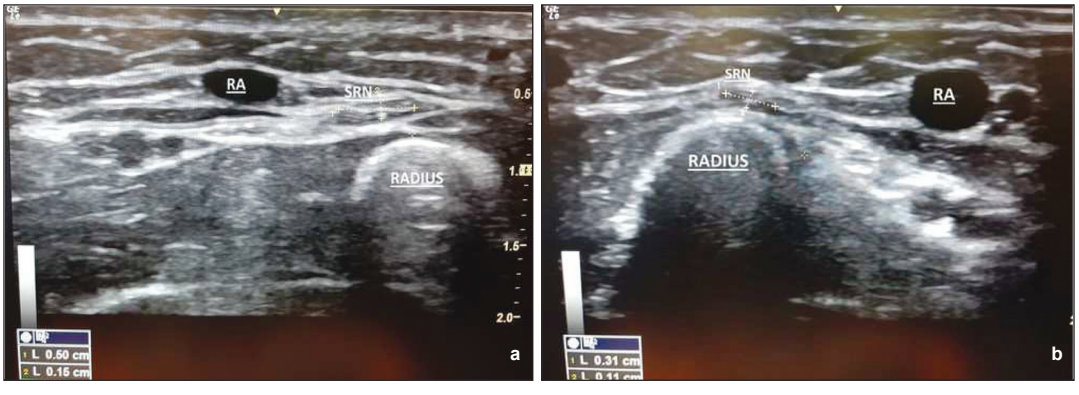

FIGURE 2: Sonographic evaluation of the superior branch of the radial nerve of the right **(a)** and left **(b)** forearm.

DISCUSSION

In this case, SRN entrapment was seen to have developed in an agricultural worker engaged in harvesting garlic. It is thought that the SRN was compressed with the repeated supination-pronation movements required by the work. The increase in diameter in the nerve was revealed in the ultrasonographic examination, when compared with the contralateral arm.

After branching from the radial nerve in the antebrachial fossa, the SRN descends below the brachioradialis muscle and lateral to the radial artery. In the distal forearm, it pierces the deep fascia, and travels between the brachioradialis and extensor carpi radialis longus tendons. It then ramifies into dorsomedial and dorsolateral branches. These branches travel along with the abductor pollicis longus and the extensor pollicis brevis tendons in the first compartment of the wrist. While the dorsolateral branch supplies the radial aspect of the thumb, the dorsomedial branch innervates the region radial to the ulnar side of the ring finger.[8]

The SRN is sensitive to local trauma due to its superficial course.[9] In addition to tightly worn watches, bracelets or handcuffs, neuropathy may also develop with penetrating injuries. The SRN can also be damaged by external causes such as distal radius fracture and soft tissue masses (lipoma, ganglion cyst, etc.).[10] The SRN is frequently trapped in the area between the brachioradialis and extensor carpi radialis longus tendons. Especially with pronation movement, the extensor carpi radialis longus passes under the brachioradialis and compresses the nerve. Repetitive pronation and supination increase this compression and cause nerve damage.[7] In the current patient, the nerve was compressed due to repetitive pronation and supination required to harvest the garlic from the soil.

The severity of the disease varies according to the severity of the compression force and the duration of the compression. In mild cases, there is mild pain and paraesthesia due to congestion and edema of the nerve, whereas in severe cases, irreversible allodynia and anesthesia can occur with arterial ischemia.[11] The nerve compression of the current patient was a reversible condition which responded well to rest and anti-inflammatory medication.

Diagnostic ultrasound is frequently used by physicians because of the many advantages such as being easily accessible/applicable, non-invasive, economical, and repeatable, it does not involve ionizing radiation and has the sono-palpation feature. The SRN appears as parallel hyperechoic lines and hypoechoic structures between them are other peripheral nerves.[12] In previous studies, it has been reported that the cross-sectional area of the nerve is increased in compression neuropathies. It also gives information about other diseases to be considered in the differential diagnosis of wrist pain such as deQuervain tenosynovitis, scaphoid fracture and thumb carpometacarpal joint arthritis. In this case, no additional pathology other than cheiralgia paresthetica was found in the ultrasonographic evaluation. EMG is often performed for diagnosis, but it can be false negative and unable to show the exact site of the lesion.[13] In the current case, the patient's EMG findings were also consistent with the diagnosis of cheiralgia paresthetica.

In conclusion, cheiralgia paresthetica is a disease that should be kept in mind in patients with forearm-hand pain and paraesthesia. It can occur as a result of repetitive and long-lasting forearm rotations as in the current case. Measurement of the SRN diameter on ultrasound has very important diagnostic value in this disease.

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