ORIGINAL RESEARCH

Bagcilar Med Bull
DOI: 10.4274/BMB.galenos.2026.28291

Assessing Radial Nerve Entrapment and Traumatic Radial Neuropathy in the Arm Segment: Clinical Correlations and Electrodiagnostic Findings

Üst Kol Segmentinde Radyal Sinir Sıkışması ve Travmatik Radyal Nöropatinin Değerlendirilmesi: Klinik Korelasyonlar ve Elektrodiagnostik Bulgular

Şencan Buturak[1], Halit Fidancı[2], Halil Can Alaydın[2], Zülfikar Arlıer[1]

[1]University of Health Sciences Turkey, Adana City Training and Research Hospital, Department of Neurology, Adana, Turkey
[2]University of Health Sciences Turkey, Adana City Training and Research Hospital, Department of Neurology, Division of Clinical Neurophysiology, Adana, Turkey

Abstract

Objective: The entrapment of the radial nerve at the spiral groove of the humerus in the arm segment (ERNAS) and traumatic radial neuropathy in the arm segment (TRNAS) are disorders that present with dropped hand. The aim of this study was to compare electrodiagnostic and clinical findings between patients with ERNAS and TRNAS, and to evaluate whether there is a correlation between these findings.

Method: This study was conducted at the Clinical Neurophysiology Laboratory of University of Health Sciences Turkey, Adana City Training and Research Hospital. ERNAS and TRNAS patients were included. The electrodiagnostic findings and the disabilities of the arm, shoulder and hand questionnaire (DASH) scores of the patients were reviewed in this retrospective study.

Results: Twenty-two ERNAS (20 male, 2 female) and 8 TRNAS (5 male, 3 female) patients were included. The mean ages of ERNAS and TRNAS patients were 45.5±16.1 and 45.0±13.8 years, respectively. The amplitudes of the superficial radial nerve compound nerve action potential (CNAP) and the radial nerve compound muscle action potential (CMAP) were significantly reduced in patients with TRNAS

Öz

Amaç: Üst kol segmentinde humerus spiral oluğunda radyal sinir sıkışması (RSS) ve travmatik radyal nöropati (TRN), düşük el ile seyreden bozukluklardır. Bu çalışmanın amacı, RSS ve TRN hastalarında elektrodiagnostik ve klinik bulguları karşılaştırmak ve bu bulgular arasında bir korelasyon olup olmadığını değerlendirmektir.

Yöntem: Çalışma, Sağlık Bilimleri Üniversitesi, Adana Şehir Eğitim ve Araştırma Hastanesi, Klinik Nörofizyoloji Laboratuvarı'nda gerçekleştirildi. RSS ve TRN tanısı alan hastalar çalışmaya dahil edildi. Retrospektif olarak tasarlanan çalışmada, hastaların elektrodiagnostik bulguları ve kol, omuz ve el sorunları anketi (DASH) skorları değerlendirildi.

Bulgular: Yirmi iki RSS (20 erkek, 2 kadın) ve sekiz TRN (5 erkek, 3 kadın) hastası çalışmaya dahil edildi. RSS ve TRN hastalarının yaş ortalamaları sırasıyla 45,5±16,1 ve 45,0±13,8 yıl idi. TRN hastalarında, yüzeyel radyal sinir bileşik sinir aksiyon potansiyeli (BSAP) ve radyal sinir bileşik kas aksiyon potansiyeli (BKAP) amplitüdleri, RSS hastalarına kıyasla anlamlı düzeyde düşük bulundu (sırasıyla p=0,002 ve p=0,007). RSS hastalarında DASH skorları ile yüzeyel radyal duyu sinir iletim hızı (SİH) arasında negatif korelasyon saptandı (p=0,001, r=-0,677).

Address for Correspondence: Halit Fidancı, Assoc. Prof., University of Health Sciences Turkey, Adana City Training and Research Hospital, Department of Neurology, Division of Clinical Neurophysiology, Adana, Turkey
E-mail: dr.halitfidanci@gmail.com **ORCID:** orcid.org/0000-0001-6573-9090
Received: 26.03.2025 **Accepted:** 02.05.2026 **Epub:** 07.05.2026

Cite this article as: Buturak Ş, Fidancı H, Alaydın HC, Arlıer Z. Assessing radial nerve entrapment and traumatic radial neuropathy in the arm segment: clinical correlations and electrodiagnostic findings. Bagcilar Med Bull. [Epub Ahead of Print]

Abstract

compared to those with ERNAS (p=0.002 and p=0.007, respectively). A negative correlation was identified between DASH scores and superficial radial sensory nerve conduction velocity (NCV) in ERNAS patients (p=0.001, r=-0.677).

Conclusion: This study indicated that superficial radial nerve CNAP and radial nerve CMAP amplitudes were more affected in TRNAS patients than in ERNAS patients. It was also concluded that there may be a relationship between superficial radial sensory NCV and clinical features.

Keywords: Electrodiagnosis, nerve conduction study, radial neuropathy, saturday night palsy, trauma

Öz

Sonuç: Bu çalışma, TRN hastalarında yüzeyel radyal sinir BSAP ve radyal sinir BKAP amplitüdlerinin RSS hastalarına göre daha fazla etkilendiğini ortaya koymuştur. Ayrıca, yüzeyel radyal duyu SİH ile klinik özellikler arasında bir ilişki olabileceği sonucuna varılmıştır.

Anahtar kelimeler: Cumartesi gecesi felci, elektrodiagnozis, radyal nöropati, sinir iletim çalışması, travma

Introduction

Radial nerve injury in the arm segment (RNIAS) may lead to sensory disturbances in the radial nerve distribution or with dropped hand, potentially leading to functional impairment of the upper extremity (1-4). RNIAS may occur due to trauma, such as a humeral fracture, or from compression of the radial nerve at the spiral groove of the humerus (1-4). Electrodiagnostic findings, along with clinical features, are essential for the diagnosis of RNIAS (1,2). Electrodiagnostic tests crucial for diagnosis of RNIAS include conduction block of the radial motor nerve, slowing of radial motor nerve conduction velocity (NCV) across the arm segment, and needle electromyography (EMG) abnormalities in radial nerve innervated muscles (1,2,5). Patients with the entrapment of the radial nerve at the spiral groove of the humerus in the arm segment (ERNAS) and traumatic radial neuropathy in the arm segment (TRNAS) may have similar clinical and electrodiagnostic features. Therefore, this study focused on evaluating the clinical and electrodiagnostic characteristics in patients with TRNAS and ERNAS, as well as investigating the relationship between these features. Consequently, understanding the pathophysiology of RNIAS was also an objective.

Materials and Methods

Patients and Study Design

Patients exhibiting clinical and electrodiagnostic characteristics consistent with RNIAS, who were referred to the Clinical Neurophysiology Laboratory at University of Health Sciences Turkey, Adana City Training and Research Hospital between November 2018 and November 2022, were included. Clinical characteristics, findings of electrodiagnostic tests, and imaging methods of all patients were recorded in this retrospective study. Assessment of muscular function was achieved with the medical research council (MRC) scale (6). The disabilities of the arm, shoulder and hand questionnaire (DASH) were applied to all patients to evaluate upper extremity functions (7,8). Additionally, the DASH work module and sports/performing arts module scores were recorded. The DASH questionnaire consists of 30 items assessing upper extremity function, each rated from 1 (no difficulty) to 5 (unable to perform), with the total score ranging from 0 (no disability) to 100 (severe disability). To obtain a valid score, at least 27 items must be completed (7,8). The optional DASH work and sports/performing arts modules each include four additional items, designed for individuals engaged in those specific activities. Patients were considered to have RNIAS if the following features were present (2-5,9,10): 1) Dropped hand/fingers and/or sensory impairment in the cutaneous region innervated by the radial nerve on neurological examination; and 2) Radial motor NCV slowing or motor conduction block of the radial nerve in the arm segment and/or needle abnormality in radial nerve innervated muscles other than the triceps muscle. Patients with the listed conditions were excluded from the study: 1) Mononeuropathy other than radial neuropathy; 2) History of diseases that can lead to polyneuropathy, including diabetes mellitus 3) Polyneuropathy; 4) Neurodegenerative disease; and 5) Clinical features, electrodiagnostic results, and imaging methods were compatible with radiculopathy or brachial plexopathy. Patients who met the diagnostic criteria for RNIAS were divided into two groups according to the mechanism of onset. Patients who met the diagnostic criteria for RNIAS were included in the ERNAS group when symptom onset occurred after prolonged external compression during sleep, in the absence of any history

of traumatic injury to the upper extremity. Patients with RNIAS whose symptom onset occurred after a documented traumatic event involving the upper extremity, specifically a humeral fracture, were included in the TRNAS group. Ethics committee approval was received from the Clinical Research Ethics Committee of University of Health Sciences Turkey, Adana City Training and Research Hospital (number: 118/2303, date: 15.12.2022).

Electrodiagnostic Tests

Nerve conduction study and needle EMG were performed on the Cadwell Sierra Summit EMG unit (Cadwell Laboratories, Kennewick, Washington, USA). Electrodiagnostic tests were performed if the extremity temperature was 32 degrees or above. In motor and sensory nerve conduction study, low-high filters were set as 20 Hz-10 kHz and 20 Hz-2 kHz, respectively. Surface electrodes were employed in stimulation. Recording was done with disc electrodes. For the motor-sensory nerve conduction study, sweep speed and sensitivity were set as 5-1 ms/division and 2000-10 µV/division, respectively. Recommended methods were used for median, ulnar and superficial radial nerve conduction studies (11-13). In median and ulnar motor nerve conduction studies, recordings were obtained from the abductor pollicis brevis and abductor digiti minimi muscles, respectively. Median and ulnar sensory nerve conduction studies were performed antidromically in the index finger-wrist and little finger-wrist segments, respectively. Amplitudes were measured peak to peak, and sensory nerve conduction velocities were calculated using peak latency. Normal values from the test laboratory were used for reference values in median and ulnar nerve conduction studies (13). For superficial radial sensory nerve conduction studies, recordings were obtained from the anatomical snuffbox region, with the reference electrode placed on the thumb. The nerve was stimulated 12-14 cm proximal to the recording electrode along the radial aspect of the forearm, and sensory NCV was calculated using the peak latency. The lower reference value for superficial radial nerve NCV and compound nerve action potential (CNAP) amplitude was set as 35.7 m/s, 11 µV, respectively (12). Superficial radial nerve CNAP amplitude was considered abnormal if the superficial radial nerve CNAP amplitude was lower than the reference value or reduced by more than 50% compared to the contralateral superficial radial nerve CNAP amplitude. In the radial motor nerve conduction study, recording was conducted using a concentric electrode (length=50 mm, diameter=0.46 mm, Bionen Medical Devices, Florence, Italy; length=50 mm, 26 G, Natus, Galway, Ireland). The recording was made in the extensor indicis proprius muscle. The stimulation points were 4 cm proximal to the recording electrode, 5-6 cm proximal to the lateral epicondyle and the ERB point. The lower reference values for radial motor NCV for the distal and proximal segments were 49.8 m/s and 59.4 m/s, respectively (11). If radial nerve compound muscle action potential (CMAP) could not be obtained, the radial nerve CMAP amplitude was considered abnormal. Motor conduction block was identified as a reduction of more than 50% in the CMAP amplitude from proximal stimulation relative to the CMAP amplitude from distal stimulation.

Needle EMG was applied with concentric needle electrodes. The low-high filter was set to 10 Hz-10 kHz. Sensitivity and sweep speed for spontaneous activity were 100 µV/division and 10 ms/division, respectively. Sensitivity and sweep speed for motor unit action potential (MUAP) examination were 0.5-1 mV/division and 10 ms/division, respectively. The presence of spontaneous discharges at rest was carefully evaluated. MUAP amplitude >3.5 mV or MUAP duration >15 ms was considered neurogenic MUAP. Needle EMG was applied to the extensor indicis proprius, extensor digitorum communis, brachioradialis, triceps, first dorsal interosseous and deltoid muscles in all patients. Additionally, in some patients, the abductor pollicis brevis, biceps brachii and cervical paraspinal muscles were examined with needle EMG for differential diagnosis.

Statistical Analysis

Nominal variables were described using rates and percentages. Numerical variables were reported as mean ± standard deviation, median, and minimum-maximum. Pearson's chi-square test was used to analyze categorical data between groups. The Mann-Whitney U test was employed for comparing numerical variables across groups. Spearman rank correlation analysis was conducted to assess relationships between variables. A p-value of less than 0.05 was considered statistically significant. Statistical analysis was performed using SPSS version 22.0.

Results

Among the 44 reviewed RNIAS patients (26 ERNAS, 18 TRNAS), 14 were excluded from the study. Two of the ERNAS patients had carpal tunnel syndrome, one had diabetes mellitus, and one had cervical radiculopathy. Three of the TRNAS patients had diabetes mellitus, four had carpal tunnel syndrome, one had ulnar neuropathy, one had cervical radiculopathy, and one had polyneuropathy associated with thyroid disease. These patients were excluded from the study. Ultimately, twenty-five male and five female RNIAS

patients were included. The mean age and body mass index of the patients were 45.4±5.3 (min-max 22-69) years and 24.8±2.9 (18.8-31.2) kg/m^2, respectively. The mean duration of illness was 55.4±41.9 (15-180) days. There were 22 ERNAS (20 male, 2 female) and 8 TRNAS patients (5 male, 3 female) (p=0.101 for gender). The mean ages (min-max) of ERNAS and TRNAS patients were 45.5±16.1 (22-69) and 45.0±13.8 (29-67) years, respectively (p=0.907). The mean durations of disease in TRNAS and ERNAS patients were 103.4±50.4 and 38.1±19.9 days, respectively (p<0.005).

RNIAS was identified in 17 patients affecting the right arm and in 13 patients affecting the left arm. Five ERNAS patients had a history of alcohol use, and two ERNAS patients had a history of narcotic use. Other ERNAS patients had a history of radial neuropathy that developed only after prolonged sleep. In 19 of the patients (63%), sensory impairment in the cutaneous area supplied by the superficial radial nerve was present during the neurological assessment. Sensory abnormalities were present in twelve ERNAS patients (55%) and seven TRNAS patients (88%) (p=0.199). All patients had muscle weakness in at least one of the radial innervation muscles. The mean (min-max) MRC scores of finger extension, wrist extension and brachioradialis muscles were 2.0±1.4 (0-4), 2.3±1.7 (0-5), 3.2±1.5 (0-5), respectively. The mean scores of DASH, DASH-work module and DASH-sports performing arts module were 50.2±28.3 (number=30), 57.9±29.3 (number=29), 50.0±27.7 (number=6), respectively. Superficial radial CNAP amplitude and NCV were 22.7±19.6 µV and 52.9±10.9 m/s, respectively. The radial motor nerve distal CMAP amplitude, the NCV and the percentage of amplitude reduction in the arm segment were 4.8±4.0 mV, 51.7±14.5 m/s and 68.9±30.9%, respectively. The comparison of clinical and electrodiagnostic findings between TRNAS and ERNAS patients is presented in Table 1. Table 2 shows the abnormalities found in the electrodiagnostic tests of the patients.

Figure 1 shows ERNAS and TRNAS patients with superficial radial nerve CNAP and radial nerve CMAP abnormalities. Table 3 shows the correlation between nerve conduction study and DASH scores in patients. There was a significant negative correlation between DASH scores and the superficial radial nerve NCV in ERNAS patients and in the overall RNIAS cohort (p=0.001, r=-0.677 for ERNAS patients; p=0.044, r=-0.406 for all RNIAS patients). Figure 2 shows the correlation between superficial radial NCV and DASH scores in ERNAS patients.

Discussion

In this study, the correlation between clinical features and electrodiagnostic findings in RNIAS patients was investigated. A negative correlation was found between DASH scores and superficial radial nerve NCV in ERNAS

Table 1. The clinical and electrodiagnostic features in ERNAS and TRNAS patients

Clinical and electrodiagnostic features	ERNAS Mean ± SD (median) (n)	TRNAS Mean ± SD (median) (n)	p-value
Clinical features			
MRC score of finger extension	1.95±1.49 (3) (n=22)	2 ±1.19 (2) (n=8)	0.807
MRC score of wrist extension	2.31±1.96 (3) (n=22)	2.37±0.91 (2) (n=8)	0.810
MRC score of the brachioradialis muscle	3.1±1.62 (4) (n=22)	3.37±0.91 (3) (n=8)	0.789
DASH scores	45.4±27.29 (45.8) (n=22)	63.5±28.35 (71.9) (n=8)	0.127
DASH-work module scores	56.21±31.55 (56) (n=21)	62.37±23.37 (62.5) (n=8)	0.805
DASH-sports performing arts module scores	42.18±31.19 (50) (n=4)	65.6±13.29 (65.6) (n=2)	0.355
Electrodiagnostic features			
Superficial radial nerve (µV) CNAP amplitude	28.55±19.51 (24.65) (n=22)	6.76±7.98 (4.35) (n=8)	**0.001**
Superficial radial nerve (m/s) NCV[a]	52±11.14 (50) (n=21)	57.9±9.4 (55.3) (n=4)	0.194
Radial nerve CMAP amplitude	5.83±3.79 (5.3) (n=22)	1.86±3.27 (0) (n=8)	**0.006**
Radial motor NCV across the arm segment[a]	50.81±15.16 (50.5) (n=16)	59±1.41 (59) (n=2)	[b]
Reduction of radial nerve CMAP amplitude in percentage (%) in the arm segment	68.14±29.77 (82.75) (n=21)	73.83±45.31 (100) (n=3)	[b]

CMAP: Compound muscle action potential, CNAP: Compound nerve action potential, ERNAS: Entrapment of the radial nerve at the spiral groove of humerus in the arm segment, DASH: The disabilities of the arm: shoulder and hand questionnaire, MRC: Medical research council, NCV: Nerve conduction velocity, SD: Standard deviation, TRNAS: Traumatic radial neuropathy in the arm segment, [a]: In some patients, NCV could not be calculated due to the absence of CNAP or distal CMAP, or because proximal CMAP could not be recorded as a result of motor conduction block, [b]: Because of the small sample size, statistical comparison was not performed. Values with p<0.05 are shown in bold

patients. Superficial radial nerve CNAP amplitudes and radial nerve CMAP amplitudes were found to be lower in the patients with TRNAS than in the patients with ERNAS.

The etiology of radial neuropathy includes conditions such as humeral fracture and systemic diseases (1,3,4). Another reason is ERNAS. This condition is also referred to as saturday night palsy (1,4,9). Similar to the characteristics of the patients in this current study, saturday night palsy can be seen after prolonged sleep as a result of alcohol or substance use, or after surgery (1,3,4). Demyelination

Table 2. Electrodiagnostic abnormalities of the patients

Abnormal electrodiagnostic features	Number of patients with abnormality of electrodiagnostic feature (%) n=30	Number of ERNAS patients with abnormality of electrodiagnostic feature (%) n=22	Number of TRNAS patients with abnormality of electrodiagnostic feature (%) n=8	Comparison between the ERNAS and TRNAS patients p-value
Superficial radial nerve CNAP amplitude	10 (33.3%)	4 (18.2%)	6 (75.0%)	**0.007**
Superficial radial nerve NCV	5[a,b] (20%)	5[a] (23.8%)	0[b] (0%)	0.549
Radial nerve CMAP amplitude	6 (20%)	1 (4.5%)	5 (62.5%)	**0.002**
Radial motor NCV across the arm segment	8[a,b] (44.4%)	8[a] (50%)	0[b] (0%)	0.526
Motor conduction block of radial nerve in the arm segment	17[a,b] (70.8%)	15[a] (71.4%)	2[b] (66.7%)	1.000
PSW and fibrillation potentials				
EIP	23 (76.6%)	17 (77.3%)	6 (75.0%)	1.000
EDC	28 (93.3%)	21 (95.5%)	7 (87.5%)	0.469
BRC	19 (63.3%)	15 (68.2%)	4 (50.0%)	0.390
Absence of MUAP				
EIP	7 (23.3%)	3 (13.6%)	4 (50.0%)	0.060
EDC	8 (26.6%)	4 (18.2%)	4 (50.0%)	0.158
BRC	5 (16.6%)	2 (9.1%)	3 (37.5%)	0.102

BRC: Brachioradialis muscle, CMAP: Compound muscle action potential, CNAP: Compound nerve action potential, EDC: Extensor digitorum communis, EIP: Extensor indicis proprius, ERNAS: Entrapment of the radial nerve at the spiral groove of humerus in the arm segment, MUAP: Motor unit action potential, NCV: Nerve conduction velocity, PSW: Positive sharp wave, TRNAS: Traumatic radial neuropathy in the arm segment, [a]: CNAP could not be obtained in one ERNAS patient/CMAP could not be obtained in one ERNAS patient/proximal CMAP could not be obtained in five ERNAS patients; [b]: CNAP could not be obtained in four TRNAS patients/CMAP could not be obtained in five TRNAS patients/proximal CMAP could not be obtained in one patient [accordingly, sensory NCV values reported for 25 patients (21 ERNAS, 4 TRNAS), and motor NCV values for 18 patients (16 ERNAS, 2 TRNAS)]. Values with p<0.05 are shown in bold

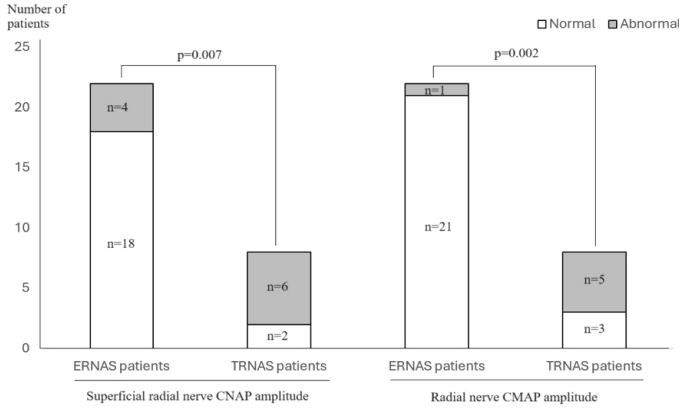

Figure 1. Amplitude abnormalities of superficial radial nerve CNAP and radial nerve CMAP among groups

CMAP: Compound muscle action potential, CNAP: Compound nerve action potential, ERNAS: Entrapment of the radial nerve at the spiral groove of humerus in the arm segment, TRNAS: Traumatic radial neuropathy in the arm segment

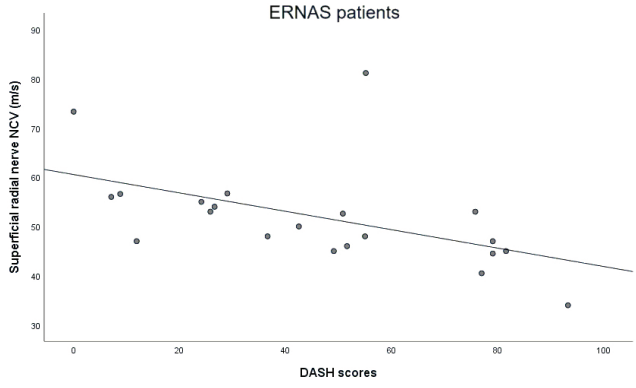

Figure 2. Negative correlation between superficial radial nerve NCV and DASH scores in ERNAS patients

DASH: The disabilities of the arm, shoulder and hand questionnaire, ERNAS: Entrapment of the radial nerve at the spiral groove of humerus in the arm segment, NCV: Nerve conduction velocity

Table 3. The correlation between DASH scores and electrodiagnostic findings in patients

Groups	SRN CNAP amplitude (μV)	SRN NCV (m/s)	RN CMAP amplitude (mV)	RN NCV across the arm segment	RN CMAP amplitude reduction in percentage in the arm segment (%)
DASH scores of ERNAS patients	p=0.960 r=0.011 (n=22)	**p=0.001,** **r=-0.677** (n=21)	p=0.713 r=0.083 (n=21)	p=0.312 r=-0.27 (n=21)	**p=0.044,** **r=-0.443** (n=21)
DASH scores of TRNAS patients	p=0.696 r=0.165 (n=8)	[a]	[a]	[a]	[a]
DASH scores of all patients	p=0.382, r=-0.165 (n=30)	**p=0.044,** **r=-0.406** (n=25)	p=0,136, r=-0.279 (n=24)	p=0.240, r=-0.292 (n=24)	p=0.137 r=0.312 (n=24)

CMAP: Compound muscle action potential, CNAP: Compound nerve action potential, DASH: The disabilities of the arm: shoulder and hand questionnaire, ERNAS: Entrapment of the radial nerve at the spiral groove of humerus in the arm segment, RN: Radial nerve, SRN: Superficial radial nerve, TRNAS: Traumatic radial neuropathy in the arm segment, [a]: Because of the small sample size, statistical comparison was not performed. Values with p<0.05 are shown in bold

contributes fundamentally to the pathophysiology of ERNAS patients (1,5,9). In radial neuropathy in the arm segment, patients present with a droopy hand (1,3,4). Sensory abnormalities in the distribution of the superficial radial nerve were noted in a substantial portion of patients, especially among those with ERNAS. This may be related to the demyelinating nature of ERNAS, where conduction impairment can occur without significant axonal loss. On the other hand, more pronounced sensory symptoms may develop in axonal lesions such as those seen in TRNAS. Nevertheless, since the difference between the groups did not reach statistical significance, these observations should be interpreted with caution. Previous studies have shown that demyelinating neuropathies generally have a more favorable prognosis than axonal injuries, particularly in terms of functional recovery (1,2,14).

Electrodiagnostic tests can provide important clues about the prognosis of RNIAS patients. The prognosis of nerve damage accompanied by axonal degeneration tends to be worse than the prognosis of nerve damage with demyelination alone (1,2,10,14). Recovery may be delayed or incomplete in axonal degeneration (1,2,5). Demyelination is predominant in ERNAS patients, and most ERNAS patients recover fully or almost completely in the first few months (1,5,9). Recovery rarely takes up to six months. In this current study, the radial nerve CMAP amplitudes of TRNAS patients were found to be lower than the CMAP amplitudes of ERNAS patients. This finding indicates that the type of radial nerve injury in ERNAS patients is compatible with segmental demyelination, and that the type of radial nerve injury in TRNAS patients is compatible with axonal degeneration. In light of this information, it can be said that the recovery in TRNAS patients may be later or worse than the recovery in ERNAS patients.

Radial nerve CMAP amplitude abnormality, radial motor nerve conduction block in the arm segment, radial motor NCV abnormality, and superficial radial nerve CNAP abnormality constitute the nerve conduction study findings in ERNAS and TRNAS patients (1,2,5). Motor conduction block and needle EMG abnormalities did not differ between ERNAS and TRNAS patients. As previously mentioned, there were electrodiagnostic difference between ERNAS and TRNAS patients in terms of abnormalities in radial nerve CMAP and superficial radial nerve CNAP amplitudes.

In this current study, a relationship was found between DASH scores and some electrodiagnostic findings. An inverse correlation was found between the severity of conduction block and DASH score in ERNAS patients. As the conduction block improves, the weakness may improve (15,16). Additionally, an inverse correlation was found between superficial radial nerve NCV and DASH scores of ERNAS patients and all RNIAS patients. Conduction block and superficial radial sensory NCV may have significant benefits in the follow-up of ERNAS patients. A reduced radial nerve CMAP amplitude in TRNAS patients may be associated with poor prognosis.

Study Limitations

There were some limitations in this study. Disease duration was different significantly between ERNAS and TRNAS patients and should be considered an important potential confounder. In addition, the disease durations of patients within the same groups also differed. Electrodiagnostic test findings and clinical features may be influenced by disease duration (17). We think that this difference is caused by the fact that ERNAS patients are admitted in the acute period and TRNAS patients are initially presented with splints or injuries or are admitted after emergency surgical intervention. Despite this duration variability, we believe

that the observed differences in parameters such as CMAP and CNAP amplitudes reflect inherent differences in nerve involvement patterns, with demyelination being more common in ERNAS and axonal damage more prominent in TRNAS. Nevertheless, the potential impact of disease duration should be acknowledged when interpreting the results, and the findings should be interpreted with appropriate caution. The low number of TRNAS patients was also a limitation, but it should be kept in mind that the exclusion criteria in the current study were strict. However, studies that do not have strict exclusion criteria and include patients with diseases that can cause polyneuropathy, such as diabetes mellitus, or those with polyneuropathy may benefit from elucidating the pathophysiology and clinical features of radial neuropathy.

Conclusion

In summary, this study showed that radial nerve CMAP and superficial radial nerve CNAP amplitudes in TRNAS patients were lower than those in ERNAS patients. This may indicate that the prognosis in TRNAS patients is worse than in ERNAS patients. These findings should be interpreted with consideration of the differing disease durations between groups, as this may have influenced the degree of nerve injury observed on electrodiagnostic testing. It was found that there may be a relationship between superficial radial sensory NCV/radial motor nerve conduction block and clinical features in ERNAS patients. A similar relationship existed between radial nerve CMAP amplitude and clinical features in TRNAS patients.

Ethics

Ethics Committee Approval: Ethics committee approval was received from the Clinical Research Ethics Committee of University of Health Sciences Turkey, Adana City Training and Research Hospital (number: 118/2303, date: 15.12.2022).

Informed Consent: Retrospective study.

Footnotes

Authorship Contributions

Surgical and Medical Practices: Ş.B., H.F., H.C.A., Concept: Ş.B., H.F., Design: Ş.B., H.F., Data Collection or Processing: Ş.B., H.F., H.C.A., Z.A., Analysis or Interpretation: Ş.B., H.F., H.C.A., Z.A., Literature Search: Ş.B., H.F., H.C.A., Z.A., Writing: Ş.B., H.F., H.C.A., Z.A.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Doughty CT, Bowley MP. Entrapment neuropathies of the upper extremity. Med Clin North Am. 2019;103(2):357-370.
2. Wang LH, Weiss MD. Anatomical, clinical, and electrodiagnostic features of radial neuropathies. Phys Med Rehabil Clin N Am. 2013;24(1):33-47.
3. Węgiel A, Karauda P, Zielinska N, Tubbs RS, Olewnik L. Radial nerve compression: anatomical perspective and clinical consequences. Neurosurg Rev. 2023;46(1):53.
4. Vij N, Kiernan H, Miller-Gutierrez S, Agusala V, Kaye AD, Imani F, et al. Etiology diagnosis and management of radial nerve entrapment. Anesth Pain Med. 2021;11(1):e112823.
5. Kim KH, Park KD, Chung PW, Moon HS, Kim YB, Yoon WT, et al. The usefulness of proximal radial motor conduction in acute compressive radial neuropathy. J Clin Neurol. 2015;11(2):178-182.
6. Kleyweg R, van der Meche F, Schimtz P. Interobserver agreement in the assessment of muscle strength and functional abilities in Guillain-Barré syndrome. Muscle Nerve. 1991;14(11):1103-1109.
7. Hudak PL, Amadio PC, Bombardier C. Development of an upper extremity outcome measure: the DASH (disabilities of the arm, shoulder and hand) [corrected]. The Upper Extremity Collaborative Group (UECG). Am J Ind Med. 1996;29(6):602-608. doi: 10.1002/(SICI)1097-0274(199606)29:6<602::AID-AJIM4>3.0.CO;2-L. Erratum in: Am J Ind Med 1996;30(3):372.
8. Düger T, Yakut E, Öksüz C, Yörükan S, Bilgutay BS, Ayhan Ç, et al. Reliability and validity of the Turkish version of the disabilities of the arm, shoulder and hand (DASH) questionnaire. Turk J Physiother Rehabil 2006;17(3):99-107.
9. Arnold WD, Krishna VR, Freimer M, Kisset JT, Elsheikh B. Prognosis of acute compressive radial neuropathy. Muscle Nerve. 2012;45(6):893-894.
10. Carlson N, Logigian EL. Radial neuropathy. Neurol Clin. 1999;17(3):499-523.
11. Oh SJ. Nerve Conduction In Focal Neuropathies In Clinical Electromyography Nerve Conduction Studies. 3rd ed. Philadelphia: Lippincott Williams & Wilkins;2003:231-234.
12. Chen S, Andary M, Buschbacher R, Del Toro D, Smith B, So Y, et al. Electrodiagnostic reference values for upper and lower limb nerve conduction studies in adult populations. Muscle Nerve. 2016;54(3):371-377.
13. Fidancı H, Öztürk İ, Köylüoğlu AC, Yildiz M, Buturak Ş, Arlier Z. The needle electromyography findings in the neurophysiological classification of ulnar neuropathy at the elbow. Turk J Med Sci. 2020;50(4):804-810.
14. Sunderland S. A classification of peripheral nerve injuries producing loss of function. Brain. 1951;74(4):491-516.
15. Capasso M, Caporale CM, Pomilio P, Gandolfi P, Lugaresi A, Uncini A. Acute motor conduction block neuropathy another Guillain-Barré syndrome variant. Neurology. 2003;61(5):617-22.
16. Kokubun N, Nishibayashi M, Uncini A, Odaka M, Hirata K, Yuki N. Conduction block in acute motor axonal neuropathy. Brain. 2010;133(10):2897-2898.
17. Bergquist ER, Hammert WC. Timing and appropriate use of electrodiagnostic studies. Hand Clin. 2013;29(3):363-370.