Acta Medica Alanya

RESEARCH ARTICLE

ARAŞTIRMA MAKALESİ

Acta Medica Alanya

2025;9(3): 236-242

DOI: 10.30565/medalanya.1829320

Two-Year Functional Outcomes of Peripheral Nerve Injuries Following the Earthquake

Deprem Sonrası Gelişen Periferik Sinir Yaralanmalarının İki Yıllık Fonksiyonel Sonuçları

Serkan Aydın[1]*, Ahmet Acar[1], Ömer Torun[1], Ahmet Berkay Girgin[1], Günbay Noyan Dirlik[2]

1.Department of Orthopedics and Traumatology, T.C. Ministry of Health Etlik City Hospital, Ankara, Türkiye.
2.Department of Orthopedics and Traumatology, Alanya Alaaddin Keykubat University, Antalya, Türkiye

ABSTRACT

Aim: This study aimed to evaluate the types of peripheral nerve injuries that developed after the Kahramanmaraş earthquakes of February 6, 2023, the accompanying complications, the treatments applied and the functional outcomes obtained at the end of a two-year follow-up period. The study also sought to reveal the long-term functional impact of nerve damage caused by crush injuries and compartment pressure following earthquakes.
Methods: This retrospective study included 19 patients diagnosed with peripheral nerve injury after the earthquake, who completed a 24-month follow-up. Diagnoses were confirmed through physical examination, electromyography (EMG) and magnetic resonance imaging (MRI) when necessary. Data regarding the affected nerve, surgical interventions, systemic complications, orthosis use and rehabilitation processes were recorded. Functional outcomes were assessed with nerve-specific validated scales: peroneal (FAAM, AOFAS), radial (DASH), sciatic (LEFS) and brachial plexus (CSS).
Results: The most frequently affected nerve was the peroneal nerve (42%), followed by sciatic, radial and brachial plexus injuries. Fasciotomy was performed in 62% of the patients and 74% underwent additional surgical procedures. Functional scores remained generally low at the end of the second year; however, patients who maintained regular rehabilitation follow-up demonstrated more notable improvement. Regression analysis showed that prolonged time under debris and undergoing fasciotomy independently predicted poorer functional outcomes.
Conclusion: Peripheral nerve injuries following earthquakes may be overlooked in the acute period but can lead to long-term functional deficits. Regular follow-up, a multidisciplinary approach and uninterrupted rehabilitation are essential for optimal recovery. Disruption of rehabilitation services in disaster settings significantly limits functional improvement.

Keywords: Peripheral nerve injury, Post-earthquake rehabilitation, Crush injury, Functional outcomes.

ÖZ

Amaç: Bu çalışma, 6 Şubat 2023 Kahramanmaraş depremleri sonrasında gelişen periferik sinir yaralanmalarının tiplerini, eşlik eden komplikasyonları, uygulanan tedavileri ve iki yıllık takip sonunda elde edilen fonksiyonel sonuçları değerlendirmeyi amaçlamaktadır. Deprem sonrası crush ve kompartman basısına bağlı sinir hasarlarının uzun dönem fonksiyonel kayıp üzerindeki etkisini ortaya koymak hedeflenmiştir.
Yöntemler: Retrospektif olarak tasarlanan çalışmada, deprem sonrasında periferik sinir yaralanması tanısı alan ve 24 aylık takibi tamamlanan 19 hasta incelenmiştir. Tanılar fizik muayene, EMG ve gerektiğinde MRG ile doğrulanmıştır. Etkilenen sinir, uygulanan cerrahi işlemler, sistemik komplikasyonlar, ortez kullanımı ve rehabilitasyon süreci kaydedilmiştir. Fonksiyonel değerlendirme sinire özgü validasyonlu ölçeklerle yapılmıştır: peroneal (FAAM, AOFAS), radial (DASH), siyatik (LEFS) ve brakial pleksus (CSS).
Bulgular: En sık peroneal sinir tutulumu (%42) saptanmıştır; ardından siyatik, radial ve brakial pleksus yaralanmaları gelmektedir. Hastaların %62'sine fasyotomi, %74'üne ek cerrahi girişimler yapılmıştır. İkinci yıl sonunda fonksiyonel skorlar genel olarak düşük seyretmiş; düzenli rehabilitasyon takibi sağlayabilen az sayıdaki hastada daha belirgin iyileşme izlenmiştir. Regresyon analizinde enkaz altında kalma süresinin artması ve fasyotomi uygulanması fonksiyonel sonuçları bağımsız olarak olumsuz etkilemiştir.
Sonuç: Deprem sonrası periferik sinir yaralanmaları, erken dönemde sıklıkla gözden kaçsa da uzun süreli fonksiyonel kayıplara yol açabilmektedir. Düzenli takip, multidisipliner yaklaşım ve kesintisiz rehabilitasyon iyileşmede kritik öneme sahiptir. Afet koşullarında rehabilitasyonun sürdürülememesi fonksiyonel iyileşmeyi belirgin biçimde sınırlandırmaktadır.

Anahtar Kelimeler: Periferik sinir yaralanması, Deprem sonrası rehabilitasyon, Crush yaralanması, Fonksiyonel sonuçlar.

Received Date: 24.11.2025 / Accepted Date: 20.12.2025 / Published (Online) Date:31.12.2025

*Corresponding Author: Serkan Aydın, MD. Department of Orthopedics and Traumatology, T.C. Ministry of Health Etlik City Hospital, Ankara, Türkiye. Phone:05333815454 / mail: drsaydin2003@yahoo.com

ORCID: 0000-0002-3620-7041

To cited: Aydın S, Acar A, Torun Ö, Girgin AB, Dirlik GN. Two-Year Functional Outcomes of Peripheral Nerve Injuries Following the Earthquake. Acta Med. Alanya 2025;9(3):236-242 DOI: 10.30565/medalanya.1829320

Introduction

Earthquakes, among the most devastating natural disasters, lead to a wide range of injuries by causing entrapment under collapsed structures [1]. Victims trapped under debris during earthquakes are exposed to high-energy trauma, with crush injury being the most common complication [2]. In large-scale disasters of this kind, due to the life-threatening complications and overall chaos, peripheral nerve injuries may initially be overlooked. However, they can result in significant long-term functional sequelae. In the literature, the incidence of traumatic peripheral nerve injuries is reported to be around 4–5%, and this rate increases when associated with crush syndrome, compartment syndrome, or long bone fractures [3, 4].

The earthquakes centered in Kahramanmaraş on February 6, 2023 disrupted not only acute surgical management but also long-term rehabilitation processes. Due to the difficulties in accessing healthcare services under disaster conditions, peripheral nerve injuries are often diagnosed late or cannot be followed regularly. Consequently, patients face permanent functional impairments and a marked decline in quality of life over the long term. The literature emphasizes that early diagnosis, a multidisciplinary approach, and prolonged orthotic support play a critical role in functional recovery after peripheral nerve injuries occurring in the aftermath of natural disasters [5, 6]. However, in post-earthquake settings, consistent follow-up and access to rehabilitation services for this patient group are often not feasible. Current literature primarily focuses on the incidence, early diagnosis, and acute management of peripheral nerve injuries following earthquakes, whereas data on long-term (≥2 years) nerve-specific functional outcomes remain extremely limited. Moreover, studies comparing the functional outcomes of different peripheral nerve involvements are scarce to nonexistent.

The aim of this study is to evaluate the affected nerves, associated complications, and the surgical and conservative treatments administered in patients who developed peripheral nerve injuries following the Kahramanmaraş earthquake of February 6, 2023, and to present the functional outcomes obtained at the two-year follow-up in comparison with the existing literature.

The originality of this study lies in its assessment of two-year outcomes using nerve-specific validated functional scoring systems in patients who sustained peripheral nerve injuries after the February 6, 2023 Kahramanmaraş earthquake, and in correlating these outcomes with relevant clinical variables. The study aims to comprehensively report the affected nerves, accompanying complications, treatment approaches, and two-year functional results in a comparative context with the current literature.

Materials and Methods

This study was conducted through the retrospective evaluation of patients who were diagnosed with peripheral nerve injury at our hospital following the Kahramanmaraş earthquakes on February 6, 2023. Among the 1,600 hospitalized patients, peripheral nerve deficits were identified in 97 individuals (6.1%). Of these, 19 patients who were able to complete the 24-month clinical follow-up constituted 19.6% of the 97 patients with documented peripheral nerve involvement and were included in the study. The study was carried out in accordance with the principles of the Declaration of Helsinki and received approval from the T.C. Ministry of Health Etlik City Hospital ethics committee on 03.12.2025 and with Ref: AEŞH-BADEK1-2025-714.

This sample represents one of the rare patient groups in the post-disaster setting for whom diagnostic confirmation, continuity of rehabilitation, and long-term functional outcomes of peripheral nerve injuries could be comprehensively assessed.

All diagnoses were confirmed through physical examination, electromyography (EMG), and magnetic resonance imaging (MRI) when necessary. Demographic data (age, sex), duration of entrapment under debris, type of affected nerve, accompanying systemic complications (such as crush syndrome, acute kidney injury), and surgical interventions performed (fasciotomy, primary repair, tendon transfer, etc.) were recorded. Additionally, orthosis use and rehabilitation processes were documented in detail.

All patients were advised to undergo an individualized rehabilitation program following the acute phase. The rehabilitation protocol was planned for 3–5 sessions per week, with each session lasting 45–60 minutes. The program included range-of-motion exercises, progressive muscle strengthening, neuromuscular electrical stimulation, sensory re-education, and functional training activities. Ankle–foot orthoses (AFO) were recommended for lower-extremity involvement, while wrist splints were advised for upper-extremity involvement. Rehabilitation adherence was assessed based on patient reports during regular follow-up visits and documentation obtained from physical therapy records.

In the second year of follow-up, functional outcomes were assessed using different validated scoring systems specific to the affected nerves. These included the Foot and Ankle Ability Measure (FAAM) and the American Orthopaedic Foot and Ankle Society (AOFAS) score for peroneal nerve injuries; the Disabilities of the Arm, Shoulder and Hand (DASH) score for radial nerve involvement; the Lower Extremity Functional Scale (LEFS) for sciatic nerve injuries; and the Constant Shoulder Score (CSS) for brachial plexus lesions.

Statistical Analysis

All data were analyzed using IBM SPSS Statistics for Windows, Version 23.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as numbers (n) and percentages (%) for categorical variables, and as mean ± standard deviation or median (minimum–maximum) for continuous variables. The normality of distribution for continuous variables was assessed using visual methods (histograms, probability plots) and analytical tests (Kolmogorov–Smirnov and Shapiro–Wilk). The Chi-square test was used for comparisons of categorical variables. For comparisons between two groups, the independent samples t-test was used for normally distributed variables, and the Mann–Whitney U test was used for non-normal distributions. For comparisons of three or more groups, one-way ANOVA or Kruskal–Wallis test was applied depending on distribution characteristics.

Results

Following the 2023 Kahramanmaraş earthquake, approximately 6,000 earthquake survivors were admitted to Ankara Etlik City Hospital, of whom 1,600 required inpatient treatment. Among these hospitalized patients, 97 (6.1%) were diagnosed with peripheral nerve deficits.

The mean age of the patients was 18.3 (18-26) years, and 68.4% were male. The average duration of entrapment under debris was 18 hours (range: 6–36 hours). The most frequently affected nerve was the peroneal nerve (42%), followed by the sciatic nerve (26%), radial nerve (21%), and brachial plexus (11%). Fasciotomy was performed in 62% of patients, while 74% underwent surgery for other indications (trauma, skin defects, additional complications, etc.) (Table 1).

Table 1. Demographic and clinical data.

Age	18,3 (18-26)
Gender	
Male	13 (%68,4)
Female	6 (%31,6)
Duration of entrapment under debris (Hour)	18 (6-36)
Side	
Right	2(%10)
Left	6(%32)
Bilateral	11(%58)
Nerve Deficit	
Peroneal	8(%42)
Sciatic	5(%26)
Radial	4(%21)
Brachial Plexus	2(%11)

Crush syndrome developed in 15.7% of patients (n = 3), and only one patient required dialysis. Seventy percent of the patients used an AFO or wrist splint for at least one year (Table 2).

Table 2. Associated injuries and treatments according to affected nerves

	Peroneal Nerve (n=8)	Radial Nerve (n=4)	Sciatic Nerve (n=5)	Brachial Plexus (n=2)	p
Fasciotomy	6	3	2	1	0.118
Crush Syndrome	1	0	0	1	0.551
Dialysis	0	0	1	0	0.108
Recovery	1	0	1	2	0.015

At the end of the second year, functional outcomes

were evaluated as follows: in patients with peroneal nerve deficits, the mean FAAM score was 58.2 and the mean AOFAS score was 55.3; in those with radial nerve involvement, the mean DASH score was 46.5; in sciatic nerve injuries, the mean LEFS score was 80; and in brachial plexus injuries, the mean CSS was 16.3 (Table 3). Only four patients were able to maintain uninterrupted adherence to the follow-up protocol, and this group demonstrated a more favorable trend in functional recovery compared with the others. In one patient, tendon transfer was performed at the 18th month following injury due to the absence of clinical and electromyographic signs of motor recovery, the persistence of loss of active dorsiflexion, and the failure to achieve functional improvement despite conservative rehabilitation. Missing data were evaluated based on retrospective chart review, and patients with missing values in critical variables were excluded from the study. For patients with partial data deficiencies during follow-up, analyses were conducted using the available data without applying any data imputation.

Table 3. Two-year post-injury functional scores

Nerve Deficit	Scoring System (min-max)	Value
Peroneal	FAAM (0-100)	58.2
	AOFAS (0-100)	55.3
Radial	DASH (0-100)	46.5
Sciatic	LEFS (0-80)	80
Brachial Plexus	CSS (0-100)	16.3

Although a LEFS score of 80/80 in a patient with sciatic nerve injury theoretically indicates full recovery, such complete functional restoration is rarely reported in the literature. This outlier can be attributed to factors such as relatively mild injury severity, consistent adherence to rehabilitation, and younger patient age. Nonetheless, the fact that LEFS is a self-reported functional scale raises the possibility that some patients may overestimate their functional status under the psychosocial burden experienced after a disaster. Therefore, this value should be interpreted with caution.

To evaluate the factors influencing functional outcomes, multiple linear regression models were constructed by treating each nerve-specific functional score as a separate dependent variable. Because the measurement ranges and clinical interpretations of the different functional scales vary, the scores were not combined into a single composite variable. Independent variables included in the model were selected based on clinical and demographic factors shown in the literature to influence peripheral nerve recovery. The dependent variables consisted of the nerve-specific functional scores: FAAM/AOFAS for peroneal nerve injuries, DASH for radial nerve involvement, LEFS for sciatic nerve injuries, and CSS for brachial plexus lesions. The independent variables were age, sex, duration of entrapment under debris, nerve type, fasciotomy, presence of crush syndrome, need for dialysis, and adherence to rehabilitation.

The regression model was found to be statistically significant ($F = 4.12$, $p = 0.009$). Model fit indices were $R^2 = 0.58$ and Adjusted $R^2 = 0.46$, indicating that the model explained 46% of the variance in functional scores.

Significant independent predictors were:

- Duration of entrapment under debris: $\beta = -0.42$ (95% CI: –0.68 to –0.15), $p = 0.004$

Each additional hour of entrapment was associated with a significant decrease in functional scores.

- Fasciotomy: $\beta = -0.36$ (95% CI: –0.59 to –0.12), $p = 0.006$

Patients who underwent fasciotomy demonstrated substantially worse functional outcomes.

Age, sex, nerve type, rehabilitation adherence, crush syndrome, and dialysis requirement were not significant predictors ($p > 0.05$). (Table 4)

Table 4. Multiple Linear Regression Analysis of Factors Influencing Functional Outcomes

Variable	Beta	CI	p-value
Age	-0.08	-0.29 – 0.11	0.39
Sex	0.12	-0.18 – 0.38	0.42
Time under rubble	-0.42	-0.68 – (-0.15)	0.004
Nerve type	0.21	-0.10 – 0.49	0.18
Fasciotomy	-0.36	-0.59 – (-0.12)	0.006
Crush syndrome	-0.14	-0.55 – 0.19	0.41
Dialysis	-0.09	-0.44 – 0.28	0.62
Rehabilitation adherence	0.19	-0.12 – 0.41	0.21

Discussion

Earthquakes are not only disasters that cause acute traumatic injuries but also complex events that may lead to long-term neurological and functional sequelae. Peripheral nerve injuries represent secondary damage with high morbidity, arising from entrapment under debris, compartment syndrome, or iatrogenic factors [7]. Consistent with the literature, we identified peripheral nerve deficits in 6.1% of patients following earthquake-related injuries, with the peroneal nerve being the most frequently affected. A high proportion of patients with nerve deficits (74%) required surgical intervention for additional indications.

Although the number of patients in our study is limited, our findings parallel existing reports, demonstrating that insufficient early diagnosis and inadequately structured rehabilitation processes after disasters restrict the potential for nerve regeneration and significantly reduce functional recovery rates [3, 8]. Notably, the four patients who were able to maintain regular follow-up demonstrated more pronounced improvement compared with others.

Interruption of rehabilitation in disaster settings, limited access to orthoses and assistive devices, and the inability to sustain long-term multidisciplinary care increase the risk of persistent motor deficits, sensory loss, and contracture development in patients with peripheral nerve injuries [4]. Therefore, post-earthquake peripheral nerve injuries should be regarded as a clinical problem requiring systematic and prolonged follow-up, rather than an issue confined solely to acute trauma management.

The incidence of peripheral nerve injuries following mass-trauma events such as earthquakes varies depending on several factors, including the severity of the trauma, the anatomical characteristics of the affected region, and the duration of entrapment under debris [9]. In multicenter studies conducted after the 2023 Kahramanmaraş earthquake, Akbaş et al. reported the incidence of peripheral nerve injuries to be approximately 9–10% [10]. These studies also noted a higher rate of peroneal nerve involvement, which was attributed to prolonged compartment pressure, ischemia–reperfusion injury following crush trauma, and the typical patterns of lower extremity entrapment under debris [11]. Similarly, in our study, peroneal nerve involvement was predominant, and lower-extremity injuries constituted the majority, with an overall peripheral nerve injury rate of 6.1%.

Post-earthquake studies from 2023 have emphasized the complementary role of bedside ultrasonography and electromyography (EMG) in evaluating peripheral nerve injuries among disaster victims. In a study evaluating 52 earthquake survivors, the contribution of ultrasound in identifying different types of nerve lesions was highlighted [12, 13]. In our series, diagnoses were confirmed through physical examination and EMG, consistent with the multi-step diagnostic algorithms recommended in the context of earthquakes and mass-trauma scenarios.

In a study published in 2024, it was reported that neuropathic pain and mood disorders frequently accompany peripheral nerve injuries following earthquakes, and that these factors have a significant impact on functional recovery [14]. This finding underscores the importance of evaluating long-term outcomes not only with motor and sensory scores but also by incorporating pain severity and psychosocial parameters. In our series as well, patients who were able to maintain regular follow-up showed a more pronounced trend toward functional improvement. This observation aligns with the literature by highlighting the critical role of continuity in follow-up for pain management, motivation, and functional gains.

Additionally, the peroneal nerve is considered a “high-risk” group among peripheral nerve injuries occurring after earthquakes. Prolonged entrapment under debris, coexistence of compartment syndrome, or crush injury are typically associated with poor prognosis in peroneal nerve lesions [15]. Rehabilitation-focused reports published after the 2023 Kahramanmaraş earthquake have clearly documented the lack of structured follow-up processes in disaster settings and the substantial long-term deficits this creates [16].

Sciatic nerve and brachial plexus injuries are among the peripheral nerve lesions with the poorest prognosis following earthquakes and high-energy trauma. In the literature, the rate of complete neurological recovery in sciatic nerve injuries has

been reported to range between 10–20%, with outcomes being particularly unfavorable in the presence of prolonged compression, ischemia, and myonecrosis [17]. Functional recovery in brachial plexus injuries largely depends on the injury pattern, the timing of reconstruction, and the continuity of rehabilitation; however, such optimal conditions are rarely achievable in disaster settings [18]. Consistent with these findings, our study demonstrated that patients with brachial plexus involvement had the lowest functional scores.

A strength of the present study is its ability to compare nerve-specific functional outcomes within the same cohort using two-year follow-up data.

Limitations

The main limitations include its retrospective design, small sample size, and heterogeneity in rehabilitation access. These limitations highlight the need for future prospective, multicenter studies employing standardized protocols in disaster settings.

Conclusion

Peripheral nerve injuries that develop after earthquakes can lead to significant long-term neurological and functional sequelae, requiring prolonged rehabilitation and follow-up. Early diagnosis, a multidisciplinary treatment approach, and sustained orthotic support are critical for achieving optimal functional recovery in this patient population. Earthquakes are major natural disasters whose impact extends far beyond the acute trauma phase. In many cases, regular follow-up and rehabilitation are not feasible for patients with post-earthquake peripheral nerve injuries, resulting in permanent functional deficits in the long term.

In mass disasters such as earthquakes, the management of peripheral nerve injuries should not be limited to the acute phase alone; ensuring access to long-term rehabilitation is vital for minimizing functional loss. Our findings strongly suggest that post-disaster healthcare systems must prioritize not only rescue operations and surgical interventions but also sustainable neuro-rehabilitation strategies.

Conflict of Interest: The author declares no conflict of interest related to this article.

Funding sources: The author declares that this study has received no financial support.

Ethical Approval: Ethical Approval obtained from Ankara Etlik City Hospital Scientific Research Evaluation and Ethics Committee. AEŞH-BADEK1-2025-714

ORCID and Author contribution: **S.A. (0000-0002-3620-7041):** Concept, design, literature review, data collection, results, finalized study, and manuscript writing. **A. A. (0000-0001-8378-4346) & Ö. T. (000-0002-5787-3908):** Concept, design, data collection, and article proofreading. **S. A. (0000-0002-3620-7041) & G. N. D. (0000-0003-0738-6455) & A. B.G. (0000-0003-3293-8231):** Data collection, gene analysis, processing and interpretation, and critical reviews. **S. A. (0000-0002-3620-7041):** Supervised the study.

Acknowledgements: The authors are grateful to participants who participated in the study.

Note: This study was presented as an oral presentation at the 34th National Turkish Orthopaedics and Traumatology Congress held in Antalya on 4-9 September 2025 and has been expanded into an article.

REFERENCES

1. Long B, Liang SY, Gottlieb M. Crush injury and syndrome: a review for emergency clinicians. Am J Emerg Med. 2023;69:180-7. doi: 10.1016/j.ajem.2023.04.029.
2. Gümüolu E, Asfurolu ZM, Eskandari MM. Demographic and clinical features of extremity crush injuries resulting from entrapment under the rubble: an orthopedic perspective. Arch Orthop Trauma Surg. 2025;145(1):453. doi: 10.1007/s00402-025-06077-3.
3. Noble J, Munro CA, Prasad VS, Midha R. Analysis of upper and lower extremity peripheral nerve injuries in a population of patients with multiple injuries. J Trauma. 1998;45(1):116-22. doi: 10.1097/00005373-199807000-00025.
4. Campbell WW. Evaluation and management of peripheral nerve injury. Clin Neurophysiol. 2008;119(9):1951-65. doi: 10.1016/j.clinph.2008.03.018.
5. Mackay MJ, Ayres JM, Harmon IP, Tarakemeh A, Brubacher J, Vopat BG. Traumatic peroneal nerve injuries: a systematic review. JBJS Rev. 2022;10(1). doi: 10.2106/JBJS.RVW.20.00256.
6. Shields RW Jr, Root KE Jr, Wilbourn AJ. Compartment syndromes and compression neuropathies in coma. Neurology. 1986;36(10):1370-4. doi: 10.1212/wnl.36.10.1370.
7. Bilir EE, Eser F, Yurdakul FG, Yanık B, Bodur H, Alemdarolu E et al. Demographic and clinical profile of amputees aftermath of the 2023 Türkiye Kahramanmara earthquake: implications for prosthetic needs. J PMR Sci. 2025; 28(3):271-7. doi: 10.31609/jpmrs.2025-109086.
8. Demirkiran O, Dikmen Y, Utku T, Urkmez S. Crush syndrome patients after the Marmara earthquake. Emerg Med J. 2003;20(3):247-50. doi: 10.1136/emj.20.3.247.
9. Lu M, Wang Y, Yue L, Chiu J, He F, Wu X et al. Follow-up evaluation with ultrasonography of peripheral nerve injuries after an earthquake. Neural Regen Res. 2014;9(6):582-8. doi: 10.4103/1673-5374.130095.
10. Akba E, Bayramlar K. Analysis of medical rehabilitation needs of 2023 Kahramanmara earthquake victims: Adıyaman example. Physiother Res Int. 2025;30(1):e70005. doi: 10.1002/pri.70005.
11. Yamak T, Engez D, Gümüyayla , Vural G. Assessment of peripheral nerve injuries by

electroneuromyography after Kahramanmara earthquakes (On February 6, 2023). Ankara Med J. 2024;24(1):72-83. doi: 10.5505/amj.2024.97957.

12. Yalçınkaya B, Sa BT, Aksakal MF, Analay P, Ocak H, Kara M et al. Optimal examination for traumatic nerve/muscle injuries in earthquake survivors: a retrospective observational study. J Yeungnam Med Sci. 2024;41(2):120-7. doi: 10.12701/jyms.2024.00087.
13. Özdemir G, Karlıda T, Bingöl O, Sarıkaya B, Çalar C, Bozkurt et al. Systematic triage and treatment of earthquake victims: our experience in a tertiary hospital after the 2023 Kahramanmara earthquake. JJt Dis Relat Surg. 2023;34(2):480-7. doi: 10.52312/jdrs.2023.1102.
14. Alaydin HC, Bozdogan GM, Paltaci R, Arlier Z, Fidanci H, Yildiz M. Neuropathic pain and mood disorders in earthquake survivors with peripheral nerve injuries. Ideggyogy Sz. 2024;77(3-4):97-102. doi: 10.18071/isz.77.0097.
15. Taylor CA, Braza D, Rice JB, Dillingham T. The incidence of peripheral nerve injury in extremity trauma. Am J Phys Med Rehabil. 2008;87(5):381-5. doi: 10.1097/PHM.0b013e31815e6370.
16. Varolgüne S. A bibliometric analysis of the 2023 Kahramanmara earthquakes: trends, gaps, and policy implications. Nat Hazards. 2025;121(11):12461-85. doi: 10.1007/s11069-025-07305-0.
17. Grinsell D, Keating CP. Peripheral nerve recontruction after injury: a review of clinical and experimental therapies. Biomed Res Int. 2014;2014:698256. doi: 10.1155/2014/698256
18. Aras Y, Aydoseli A, Sabancı PA, Akçakaya MO, Alkır G, Imer M. Functional outcomes after treatment of traumatic brachial plexus injuries: clinical study. Ulus Travma Acil Cerrahi Derg. 2013;19(6):521-8. doi: 10.5505/tjtes.2013.48107.