Eskisehir Med J. 2026; 7(1): 6-11
doi: 10.48176/esmj.2025.227

Original Article

FASCIOTOMY FOR EARTHQUAKE-RELATED EXTREMITY CRUSH INJURY: TIMING, ANATOMIC LOCALIZATION, CO-PROCEDURES, AND IN-HOSPITAL MORTALITY IN A SINGLE-CENTER COHORT

MEHMET YİĞİT GÖKMEN[1], HASAN ORKUN VARMIŞ[2]

[1] Department of Orthopaedics and Traumatology, Çanakkale Onsekiz Mart University, Faculty of Medicine, Çanakkale, Türkiye
[2] Department of Orthopedics and Traumatology, University of Health Sciences, Adana City Training and Research Hospital, Adana, Türkiye

ABSTRACT

Introduction: Earthquakes cause a high rate of limb crush injuries complicated by acute compartment syndrome (ACS), leading to numerous fatalities. Following the 2023 earthquakes in Türkiye, we aimed to characterize the timing, anatomical distribution, accompanying procedures, and short-term outcomes of fasciotomies performed for acute compartment syndrome at a tertiary referral center.

Methods: We conducted a retrospective cohort study at Adana City Training and Research Hospital during the first week following the earthquake. Patients with extremity crush injury were included; those undergoing fasciotomy for suspected or confirmed ACS constituted the fasciotomy cohort. Demographic, clinical, procedural, and mortality data were extracted from medical records. Comparative analyses assessed age, timing, fracture association, and co-procedures between fasciotomy and non-fasciotomy groups.

Results: Among 473 patients with extremity crush injury, 327 (69.1%) underwent fasciotomy. Fasciotomies clustered within the first 48 hours and predominantly involved the lower limb (68.5%), especially the cruris. Compared with non-fasciotomy patients, the fasciotomy cohort was younger ($p < 0.001$), underwent surgery sooner after the earthquake ($p < 0.001$), and was less likely to have fractures ($p < 0.001$). Sixteen fasciotomy patients died in-hospital, with mortality influenced by systemic complications rather than limb management alone.

Conclusions: Fasciotomy represented a substantial portion of the orthopedic workload in the first week following the earthquakes, with a front-loaded distribution, primarily involving procedures in the lower limb, concentrated within the first 48 hours. These data emphasize the need for early staffing surge, instrument and dressing preparedness, structured wound-care pathways, and integration for crush syndrome.

Keywords: Earthquake, Compartment syndrome, Trauma, Crush injury, Fasciotomy, Mortality

INTRODUCTION

Major earthquakes generate a surge of trauma that rapidly overwhelms hospital capacity, disrupts referral pathways, and compresses decision-making timelines (1). Among musculoskeletal injuries, extremity crush trauma complicated by acute compartment syndrome (ACS) is both common and consequential in the disaster setting (2,3). Delays inherent to collapsed infrastructure, transport bottlenecks, and concurrent mass-casualty triage can obscure evolving neurovascular findings and postpone decompression (4). When diagnosis relies primarily on clinical assessment rather than pressure monitoring, as is typically the case during disasters, teams must balance the risks of under- and over-decompression while maintaining operative throughput and postoperative wound care at scale (5,6).

Fasciotomy is the definitive intervention for ACS, yet its real-world performance under disaster logistics is imperfectly characterized. Quantitative data describing the timing and anatomical distribution of fasciotomies under earthquake conditions remain limited. Most reports emphasize principles (early recognition, timely decompression, meticulous wound management) but provide limited operational detail on when fasciotomies actually occur during the first week, which anatomical patterns dominate the operative caseload, and how fasciotomy intersects with other procedures such as debridement, fracture fixation, and amputation (7,8). Pediatric considerations further complicate care, analgesia, sedation for dressing changes, and rehabilitation resources differ significantly from those for adults, yet age-stratified insights are often sparse. As a result, clinical recommendations remain principle-driven and comparatively sparse in quantitative, day-by-day accounts of hospital workload.

Türkiye's February 6, 2023, earthquakes imposed extraordinary operational constraints, and we documented real-world surgical delivery under disaster conditions. In this context, a tertiary referral center received large volumes of earthquake-related injuries, enabling a granular description of surgical flows. We focused on patients with clinically documented extremity crush injury, particularly those who underwent fasciotomy for suspected or confirmed ACS. This approach quantifies core aspects of care, including the time from the earthquake to

Corresponding Author: Mehmet Yiğit Gökmen, Department of Orthopaedics and Traumatology, Çanakkale Onsekiz Mart University Faculty of Medicine, Çanakkale, Türkiye
E-mail: mehmet_yigit_gokmen@hotmail.com
ORCID: 0000-0003-1243-2057

Submission Date: 30.09.2025 **Acception Date:** 23.11.2025
Cite as: Gokmen MY, Varmis HO. Fasciotomy For Earthquake-Related Extremity Crush Injury: Timing, Anatomic Localization, Co-Procedures, And In-Hospital Mortality In A Single-Center Cohort. Eskisehir Med J. 2026; 7(1): 6-11. doi: 10.48176/ esmj.2025.227.

surgery, anatomical distribution by limb and site, co-occurring procedures, and short-term in-hospital mortality.

This study reports a single-center experience from a high-volume tertiary hospital in its first week following the 2023 earthquakes. We delineated the patient flow from emergency presentation to a surgically treated orthopedic cohort; characterized the fasciotomy subset with respect to timing, age profile, limb, and anatomical distribution; quantified co-procedures performed during the same admission (debridement, fracture fixation, amputation) and their combinations; and described in-hospital deaths among fasciotomy patients. By presenting compact, day-by-day, and anatomy-specific data from a real disaster environment, we aim to inform surgical planning, staffing, and wound-care allocation for future mass-casualty responses.

METHODS

Ethics Committee Approval

The protocol was approved by the Adana City Training and Research Hospital Clinical Research Ethics Committee on May 11, 2023 (Meeting No. 126, Decision No. 2548). Given the retrospective design, informed consent was waived for individual participants. All data were anonymized prior to analysis, and reporting adheres to the STROBE guideline for observational studies.

Setting, Population, and Data

We conducted a single-center retrospective cohort study at Adana City Training and Research Hospital during the first week after the February 6, 2023, earthquakes in Türkiye (February 6–13, 2023). Earthquake-related conditions were identified via ICD-10 codes X34 (victim of earthquake) and/or X39 (exposure to forces of nature). From all earthquake-related musculoskeletal presentations, we included patients with clinically documented extremity crush injury. Patients undergoing emergent fasciotomy for suspected/confirmed acute compartment syndrome constituted the fasciotomy cohort; where feasible, clinically comparable crush-injured patients without fasciotomy formed a reference group. We excluded non-earthquake trauma, records missing key variables (age, sex, procedure type, operation day), and non-acute outpatient encounters. Data were abstracted from electronic medical records, emergency logs, orthopedic consultation notes, operative reports, and discharge summaries.

Definitions and Procedures

ACS was a clinical diagnosis based on integrated assessment of the 5 Ps: disproportionate pain, pallor, paresthesia, pulselessness (confirmed with Doppler when required), and paralysis (9). Routine intracompartmental pressure measurements were not feasible due to logistical constraints in the disaster setting. Standard decompressive fasciotomies were executed according to the limb and compartments involved. Postoperative wound care included daily assessments with paraffin-impregnated/antiseptic dressings and bedside debridement

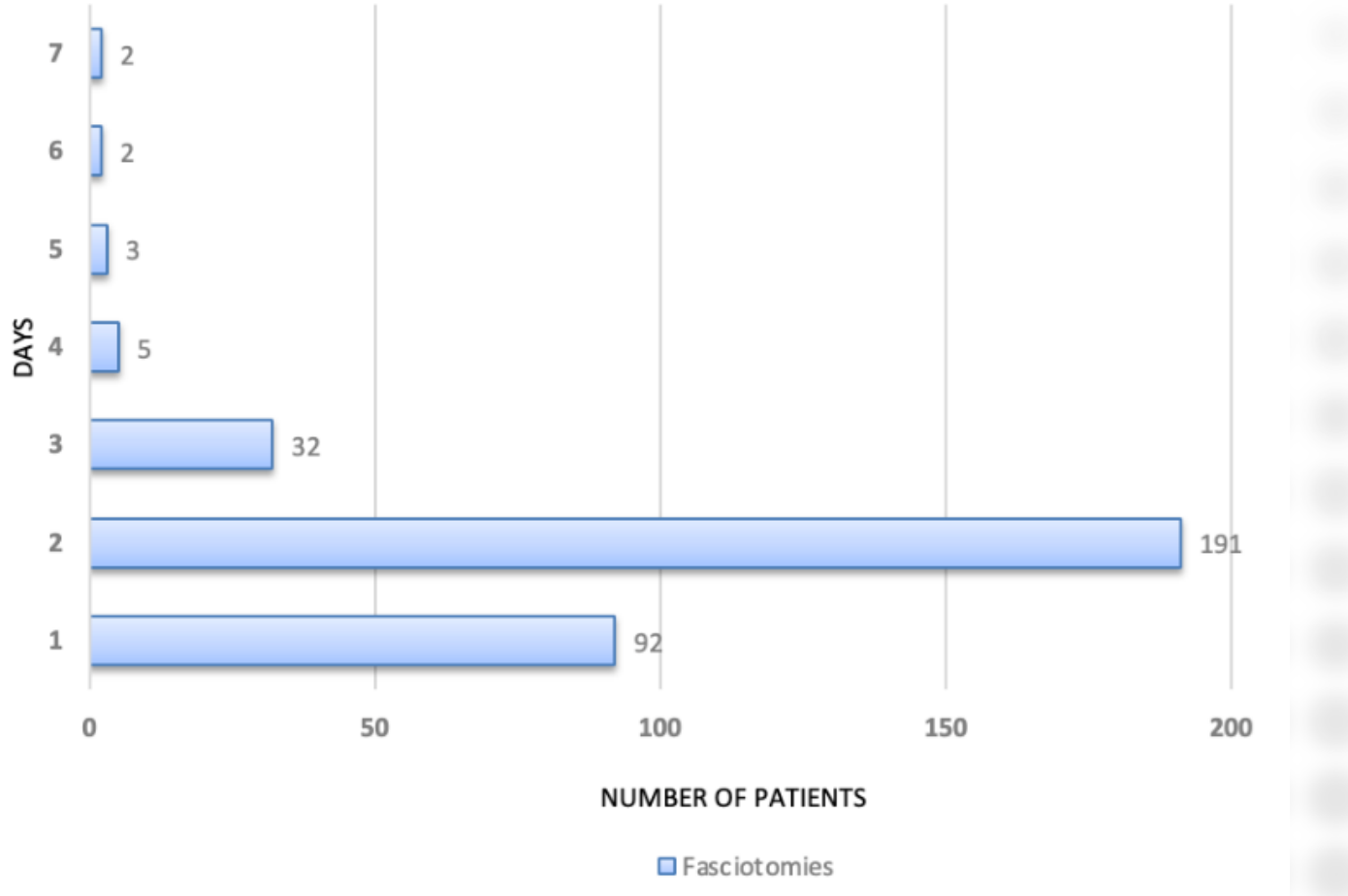

Figure 1 Day-by-day distribution of fasciotomies during the first week after the earthquakes

Table 1. Operative timing and anatomic involvement in fasciotomy-related in-hospital deaths

Patient	Sex	Age	Limb(s) involved	Fasciotomy site(s)	Operation day	Day of death
1	Female	46	Left lower limb	Left cruris fasciotomy	2	3
2	Female	73	Bilateral lower limbs	Bilateral cruris fasciotomy	2	4
3	Female	49	Left upper limb	Left hand, forearm fasciotomy	3	7
4	Male	33	Right lower limb	Right cruris fasciotomy	3	7
5	Male	32	Right lower limb	Right cruris fasciotomy	3	5
6	Female	17	Right upper limb	Right forearm fasciotomy	2	3
7	Male	60	Right upper and lower limbs	Right forearm, arm, cruris, thigh fasciotomy	2	3
8	Male	27	Left upper limb	Left arm fasciotomy	1	2
9	Female	60	Left upper limb	Left arm fasciotomy	1	3
10	Female	56	Left upper limb	Left arm fasciotomy	1	6
11	Male	1	Left lower limb	Left cruris fasciotomy	2	3
12	Female	26	Bilateral lower limbs	Bilateral cruris fasciotomy	1	2
13	Male	28	Left lower limb	Left dorsum of foot, cruris, thigh fasciotomy	2	5
14	Male	44	Left lower limb	Left cruris fasciotomy	1	2
15	Female	35	Right upper limb	Right arm fasciotomy	2	3
16	Male	10	Bilateral lower limbs	Bilateral dorsum of foot, cruris, and right thigh fasciotomy	2	6

Note: Days are indexed from the time of the earthquake; Day 1 covers 0–24 hours post-event.

under sedoanalgesia as needed; in pediatric patients, dressing changes and debridements were preferentially performed in the operating room under sedoanalgesia for safety and tolerance. We recorded timing variables (day-by-day fasciotomy counts from the earthquake and time to surgery), co-procedures (debridement, fracture fixation/osteosynthesis, amputation), demographic/clinical variables (age, sex, affected limb, and anatomical site), and in-hospital deaths.

Statistical Analysis

No a priori sample size calculation was performed, given the exploratory nature of this disaster-based, retrospective cohort and the inclusion of all consecutive eligible patients within the first post-earthquake week. Continuous variables were summarized as median (IQR) or mean ± SD based on distribution assessed by Shapiro–Wilk and visual inspection. Between-group comparisons used Mann–Whitney U or independent-samples t-tests for continuous variables, and Chi-square or Fisher's exact tests for categorical variables (when expected counts <5). Day-by-day fasciotomy counts were displayed as bar charts; co-procedure

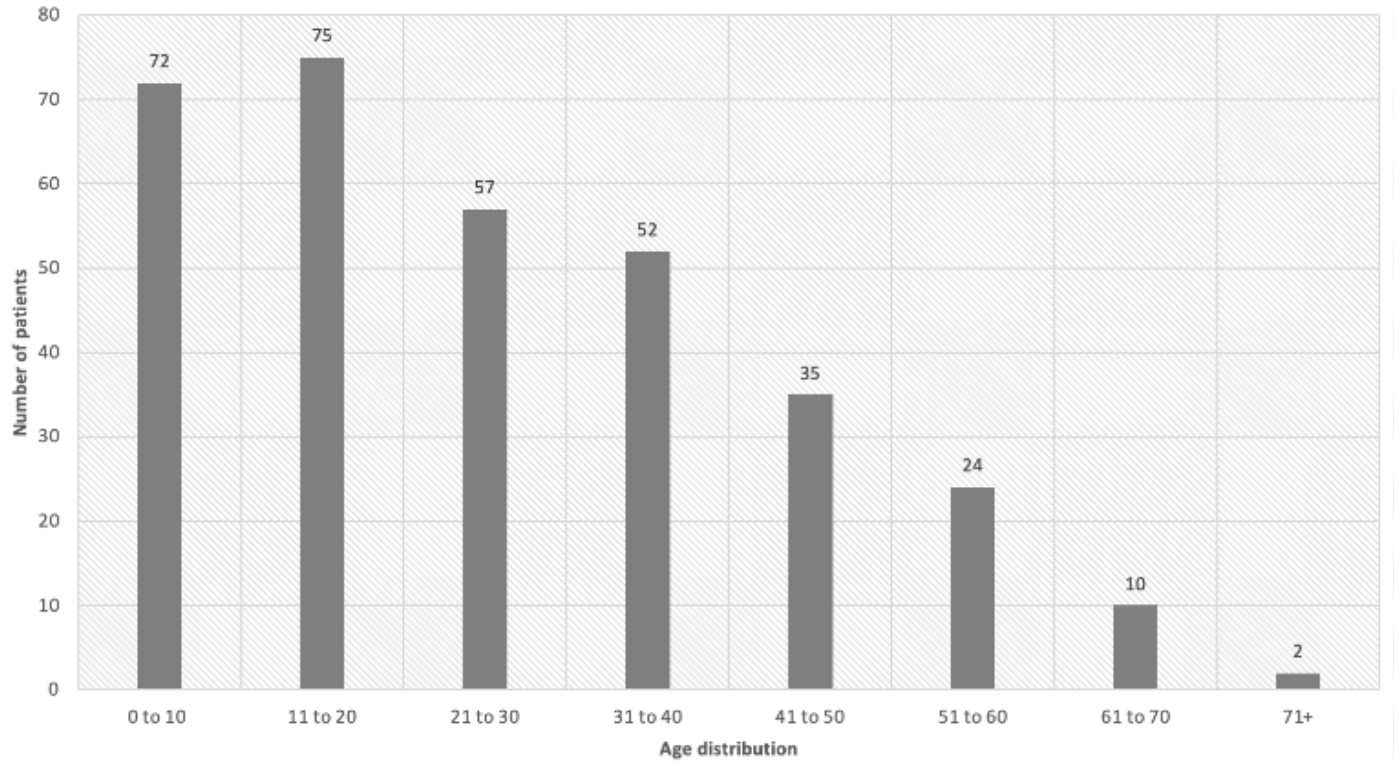

Figure 2 Age distribution of patients who underwent fasciotomy during the first week after the earthquakes.

combinations were summarized in contingency tables. Missing data were reported per variable and handled by listwise deletion in comparative analyses, with analytic denominators specified. Two-sided $p < 0.05$ was denoted as statistically significant. Analyses were performed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA).

RESULTS

Among patients hospitalized during the first post-earthquake week because of musculoskeletal trauma (n = 1,092), extremity crush injuries were identified in 473 cases (43.3%). Surgical decompression was required in a substantial proportion of these patients, with fasciotomy performed in 327 patients, corresponding to 69.1% of those with crush injuries.

The fasciotomy cohort was younger than the non-fasciotomy group (median 22 [range 0–73] vs 33 [0–93]; $p < 0.001$). The median time from the earthquake to surgery was two days for patients undergoing fasciotomy and three days for those not undergoing fasciotomy ($p < 0.001$). Amputation occurred in 15.6% of fasciotomy patients and 14.0% of those without fasciotomy ($p = 0.547$). Fractures were less frequent among fasciotomy patients than among those without fasciotomy (10.4% vs 38.1%, $p < 0.001$).

Fasciotomies clustered within the first 48 hours and declined over subsequent days (Figure 1). Age distribution within the fasciotomy cohort was skewed toward younger patients (Figure 2).

By limb, fasciotomies involved the upper limb in 103 patients (31.5%) and the lower limb in 224 (68.5%); 20 (6.1%) had both upper- and lower-limb involvement. Within the upper limb, the forearm was most frequent (64; 19.6%), followed by the upper arm (51; 15.6%); bilateral upper-limb involvement occurred in 9 (2.8%), and combined forearm–upper arm in 12 (3.7%). Within the lower limb, cruris fasciotomy predominated (201; 61.5%), followed by the thigh (58; 17.7%) and combined cruris–thigh (35; 10.7%); bilateral lower-limb fasciotomies were recorded in 47 (14.4%).

Co-procedures during the same admission reflected substantial soft-tissue burden: debridement in 85 patients, fracture fixation in 34, and amputation in 51. Higher-order patterns included fracture with debridement (n = 12), fracture with amputation (n = 4), debridement with amputation (n = 13), and all three procedures (n = 2).

Sixteen fasciotomy patients died in-hospital; detailed demographic, anatomic, and timing characteristics are presented in Table 1.

DISCUSSION

Our first-week experience shows that fasciotomy constituted a sizable share of the operative workload among surgically treated orthopedic patients, with decompressions being front-loaded into the first 48 hours and dominated by lower-limb releases, particularly the cruris (approximately 70% of lower limb; cruris approximately 60%). This pattern mirrors a single-center report from the 6 February 2023 Türkiye earthquakes (10), where orthopaedic caseloads surged in the first 36–48 h, lower-extremity injuries substantially outnumbered upper-extremity cases, and a large fraction of fasciotomies occurred on Days 1–2 as access and referrals stabilized; moreover, bedside fasciotomy was used safely when operating-room capacity was saturated. Globally, analogous distributions have been documented after other major earthquakes: in Nepal (2015), emergency volume in the first 5 days quintupled with a predominance of lower-extremity trauma; in Kashmir (2005), 59.9% of major extremity injuries involved the lower limb; and post-Haiti (2010) reviews emphasized orthopaedic crush/compartment syndromes as early drivers of surgical workload, even when fasciotomy timing and capacity varied across sites (11–13). From a preparedness perspective, these findings underline the necessity of surge staffing within the first 48 hours, pre-positioned fasciotomy sets for lower limbs, ample dressing supplies, and structured sedoanalgesia pathways for pediatric patients.

The predominance of cruris involvement is anatomically plausible in crush entrapment, where the tight osteofascial compartments of the leg are particularly vulnerable, and has been repeatedly demonstrated across reports of the 2023 Türkiye earthquake and prior disasters. A contemporary series from Türkiye documents that lower-limb injuries outnumber upper-limb trauma, and that leg fasciotomies dominate the early surgical workload, especially in the first 36–48 hours as referrals and access stabilize. Inventory guidance from the same cycle explicitly emphasizes stocking leg fasciotomy sets and wide wound-dressing supplies for this early peak (14). Systematic and narrative reviews of earthquake orthopaedics similarly note a consistent predominance of lower-extremity injuries across events, reinforcing the need to ensure external-fixator readiness, particularly for tibial injuries, and to align fixation strategies with damage-control principles in austere environments (3,6,15,16). Beyond the initial surge, fasciotomy wounds generate a sustained dressing workload; scoping and pragmatic reviews highlight that evidence for optimal post-fasciotomy wound care is fragmented, closure often requires staged strategies, and services must plan for repeated painful dressings and delayed closure, logistics that justify early stockpiling of dressings and negative-pressure capability (17–19). Collectively, these data support preloading leg-focused fasciotomy trays, verifying external-fixator compatibility for the tibia and distal leg, and maintaining ample dressing stock to absorb an early peak in cases, followed by a prolonged period of wound care (14).

Timing is crucial, but it is often unpredictable and messy in disasters. Outside disaster settings, guidance for ACS recommends very early decompression, often within 6–8 hours, and cautions against late fasciotomy when frank necrosis is evident, reflecting consensus statements and clinical practice guidelines (20). Earthquake cohorts, however, consistently exhibit wider timing distributions driven by entrapment duration, transport bottlenecks, and limited diagnostics. Systematic reviews across body regions confirm that delays are common in austere environments and that earlier fasciotomy tends to reduce adverse outcomes at the population level (21). Our own Day-1/Day-2 clustering mirrors single-center analyses from the 2023 Türkiye earthquakes, where early surges in operative demand were documented, and lower-extremity fasciotomies predominated; comparative work from the same cycle also suggests that fasciotomies performed after 24 hours carry higher rates of muscle excision and amputation risk, particularly in the leg, highlighting the cost of delay when viability is marginal (8,22). Disaster reviews further caution that fasciotomies undertaken in austere "in-zone" conditions can face a higher risk of contamination and infection than procedures performed after transfer to better-resourced centers, owing to constraints on debridement, antibiotics, and wound care logistics, rather than an

indictment of the indication itself (6). Practically, decision-making should prioritize serial clinical assessment and tissue viability while pushing for early access where feasible (including bedside capability when the OR is saturated), rather than applying an absolute clock in resource-limited settings; ACS can declare itself over a 0–48-hour window, and the safest path is vigilant re-examination coupled with rapid decompression once thresholds are met (10,20).

The age distribution in our fasciotomy cohort skews young, aligning with Turkish reports from the 2023 earthquakes that documented substantial pediatric and young-adult involvement in earthquake-related musculoskeletal trauma and ACS care, with lower-extremity fasciotomies predominating in early surge periods (23). These pediatric-leaning casemixes carry practical implications: children require age-appropriate analgesia and procedure-related sedation for painful, repetitive dressing changes and staged debridements, and outcomes improve when care pathways reflect pediatric physiology rather than adult protocols (24). Feasibility studies and protocols demonstrate that structured sedation/analgesia for pediatric dressing changes can be safely implemented in wards with low adverse-event rates when guided by standardized monitoring and escalation criteria, reinforcing the need to plan pediatric sedation capacity during the first week (25,26). Moreover, pediatric-focused disaster reports from Türkiye emphasize that most injured children present in the first days after an earthquake and subsequently require dedicated rehabilitation trajectories distinct from adults, further justifying the allocation of pediatric OR time specifically for dressing changes and repeat debridements during the initial surge and beyond (27).

Co-procedures in our series, frequent debridement, modest fracture fixation, and a non-trivial amputation rate, mirror patterns reported across earthquake cohorts, where soft-tissue compromise rather than fracture complexity dominates early theater time. Field and hospital reports from Haiti (2010), Nepal (2015), and Türkiye (2023) consistently list debridement, fasciotomy, and amputation among the most common procedures in the acute window, with orthopedics shouldering the sustained wound-surgery workload as transfers and triage stabilize (11,28,29). Critical-care and surgical reviews for crush-injured patients emphasize iterative wound care, serial debridement, contamination control, tetanus/early antibiotics, and re-debridement when needed, particularly when fasciotomies are performed in austere or “in-zone” settings (6). Post-fasciotomy wound management also generates a prolonged dressing burden. Guidance supports staged closure strategies (e.g., dermatotraction or negative-pressure wound therapy), but notes that the evidence quality is mixed and closure is often delayed by edema and tissue viability constraints (19,30). Accordingly, operational planning should pair fasciotomy capacity with dedicated rooms and supplies for repeated dressings, culture-guided antimicrobial therapy, and negative-pressure wound therapy, where local protocols and evidence support its use, while remaining mindful of cautions against uncritical adoption of negative-pressure wound therapy in compartment syndrome wounds (31,32).

Mortality among our fasciotomy patients (approximately 5%) falls within the broad post-earthquake range; these outcomes are better explained by entrapment duration, rhabdomyolysis/acute kidney injury, and transfer patterns rather than decompression alone (33). Recent nephrology and critical-care analyses from the same disaster cycle emphasize that acute kidney injury is common in crush syndrome, dialysis needs are substantial, and risk stratification for renal replacement therapy remains challenging, factors that likely co-determine survival alongside limb management. Integrating early renal protocols with surgical pathways is therefore essential to reduce preventable deaths (34,35).

Limitations

This study has several limitations. First, its single-center, retrospective design limits causal inference and external generalizability. Second, the analysis is limited to the first week after the earthquakes; longer-term outcomes, including limb function, infection, and reoperation, were not captured. Third, ACS diagnosis relied primarily on clinical assessment without routine compartment pressure monitoring, which may introduce misclassification under disaster logistics. Fourth, selection and transfer biases are possible: patients presenting later, those transferred to or from other facilities, and those with non-survivable multisystem trauma may be under- or over-represented in specific subgroups. Additionally, interobserver validation of clinical ACS diagnosis was not performed, and timing distribution may have been affected by late presenters or inter-hospital transfers.

CONCLUSION

In the first week after the earthquakes, fasciotomy represented a major share of orthopedic operations, concentrated in the first 48 hours, skewed toward younger patients, and dominated by lower-limb, particularly cruris, releases; debridement was frequent, and amputation occurred in a meaningful minority, with in-hospital deaths documented. These anatomy-specific, day-by-day data support practical planning: concentrate staffing in the first 48 hours, prioritize lower-limb fasciotomy instruments and dressings, implement structured pathways for daily dressings and staged debridements, including pediatric sedoanalgesia, and integrate care with renal and critical-care protocols for crush syndrome. While single-center and limited to the first week, the findings provide actionable inputs for disaster preparedness and bedside decision-making and define priorities for prospective, multicenter follow-up on functional outcomes, infection, and reoperation.

Ethics Committee Approval: The protocol was approved by the Adana City Training and Research Hospital Clinical Research Ethics Committee on May 11, 2023 (Meeting No. 126, Decision No. 2548).

Informed Consent: Info Given the retrospective design, informed consent was waived for individual participants. All data were anonymized prior to analysis, and reporting adheres to the STROBE guideline for observational studies.

Authorship Contributions: Idea/Concept: MYG; Design: MYG and HOV; Supervision: MYG and HOV; Data Collection and Processing: MYG; Analysis and Interpretation: MYG; Literature Search: MYG and HOV; Writing: MYG; Critical Review: HOV; References and Funding: MYG and HOV; Materials: MYG.

Conflict of Interest: The authors declare that they have no financial conflict of interest with regard to the content of this report.

Financial Disclosure: The authors declare that they have no relevant financial.

REFERENCES

1.Hasan MdK, Nasrullah SM, Quattrocchi A, Arcos González P, Castro-Delgado R. Hospital surge capacity preparedness in disasters and emergencies: a systematic review. Public Health. 2023;225:12-21.

2.Long B, Liang SY, Gottlieb M. Crush injury and syndrome: A review for emergency clinicians. The American Journal of Emergency Medicine. 2023;69:180-7.

3.Altintas B, L Helfet D. Orthopedic surgery in disaster. Acta Orthop Traumatol Turc. 2023;57:301-5.

4.Türkiye: 2023 Earthquakes Situation Report No. 11, as of 23 March 2023. Türkiye: 2023 Earthquakes Situation Report No. 11, as of 23 March 2023. November 23, 2023. Accessed April 17, 2023. https://reliefweb.int/report/turkiye/turkiye-2023-earthquakes-situation-report-no-11-23-march-2023-entr

5.Davidson AL, Sutherland MA, Siska RC, Janis JE. Practical Review on the Contemporary Diagnosis and Management of Compartment Syndrome. Plast Reconstr Surg Glob Open. 2024;12:e5637.

6.Abu-Zidan FM, Jawas A, Idris K, Cevik AA. Surgical and critical care management of earthquake musculoskeletal injuries and crush syndrome: A collective review. Turk J Emerg Med. 2024;24:67-79.

7.Donaldson J, Haddad B, Khan WS. The Pathophysiology, Diagnosis and Current Management of Acute Compartment Syndrome. TOORTHJ. 2014;8:185-93.

8.Demir EB, Barça F, Atilla HA, et al. The effects of timing on fasciotomy outcomes in compartment syndrome - experience from crush-induced trauma following 2023 Turkey earthquakes. Eur J Trauma Emerg Surg. 2025;51:42.

9. Coccolini F, Improta M, Picetti E, et al. Timing of surgical intervention for compartment syndrome in different body region: systematic review of the literature. World J Emerg Surg. 2020;15:60.

10.Gök M, Melik MA. Clinical features and outcomes of orthopaedic injuries after the kahramanmaraş earthquake: a retrospective study from a hospital located in the affected region. Scand J Trauma Resusc Emerg Med. 2024;32:10.

11.Giri S, Risnes K, Uleberg O, et al. Impact of 2015 earthquakes on a local hospital in Nepal: A prospective hospital-based study. Dangal G, ed. PLoS ONE. 2018;13:e0192076.

12.Sonshine DB, Caldwell A, Gosselin RA, Born CT, Coughlin RR. Critically assessing the Haiti earthquake response and the barriers to quality orthopaedic care. Clin Orthop Relat Res. 2012;470(10):2895-904.

13.Mulvey JM, Awan SU, Qadri AA, Maqsood MA. Profile of injuries arising from the 2005 Kashmir Earthquake: The first 72h. Injury. 2008;39:554-60.

14.Asfuroğlu ZM, Gökosmanoğulları SF, Colak M, Yilmaz C, Eskandari MM. First 10 days after the 6th of February 2023 earthquake disaster: experience of an orthopedic clinic on the border of the disaster zone. Ulus Travma Acil Cerrahi Derg. 2023;29:1191-98.

15.MacKenzie JS, Banskota B, Sirisreetreerux N, Shafiq B, Hasenboehler EA. A review of the epidemiology and treatment of orthopaedic injuries after earthquakes in developing countries. World J Emerg Surg. 2017;12:9.

16.Boillot F, Herard P. External fixators and sudden-onset disasters: Médecins Sans Frontières experience. Int Orthop. 2014;38(8):1551-54.

17.Matt SE, Johnson LS, Shupp JW, Kheirbek T, Sava JA. Management of fasciotomy wounds--does the dressing matter? Am Surg. 2011;77:1656-60.

18.Shu Q, Zhang X, Yuan Y, et al. Disaster-Related Wound Care: A Scoping Review. Nurs Open. 2024;11:e70066.

19.Igoumenou VG, Kokkalis ZT, Mavrogenis AF. Fasciotomy Wound Management. In: Mauffrey C, Hak DJ, Martin III MP, eds. Compartment Syndrome: A Guide to Diagnosis and Management. Springer; 2019. Accessed September 28, 2025. http://www.ncbi.nlm.nih.gov/books/NBK553899/

20.Osborn ColPM, Schmidt AH. Management of Acute Compartment Syndrome. J Am Acad Orthop Surg. 2020;28:e108-e114.

21.Coccolini F, Improta M, Picetti E, et al. Timing of surgical intervention for compartment syndrome in different body region: systematic review of the literature. World J Emerg Surg. 2020;15:60.

22.Gökmen MY, Uluöz M, Pazarcı Ö, Çiloğlu O, Varmış HO. Aftermath Türkiye's double earthquake: detailed analysis of fracture characteristics and acute management from a level I trauma center. Scand J Trauma Resusc Emerg Med. 2024;32:43.

23.Kundakci B, Mirioglu A, Tekin M, et al. 6 February 2023, orthopedic experience in Kahramanmaraş earthquake and surgical decision in patients with crush syndrome. J Orthop Surg Res. 2023;18:537.

24.Friedrichsdorf SJ, Goubert L. Pediatric pain treatment and prevention for hospitalized children. PR9. 2020;5:e804.

25.Hubara E, Berzon B, E Nellis M, et al. Safety of pediatric sedation and analgesia during burn dressing changes by pediatric residents. Pediatric Anesthesia. 2023;33:546-51.

26.Coté CJ, Wilson S, AMERICAN ACADEMY OF PEDIATRICS, AMERICAN ACADEMY OF PEDIATRIC DENTISTRY. Guidelines for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures. Pediatrics. 2019;143:e20191000.

27.Kıraç Ünal Z, Koçyiğit K, Adıgüzel E, Ünlü Akyüz E. An Overview of a Pediatric Rehabilitation Clinic After the Kahramanmaraş Earthquakes. jpr. 2023;10:270-7.

28.Centers for Disease Control and Prevention (CDC). Post-earthquake injuries treated at a field hospital --- Haiti, 2010. MMWR Morb Mortal Wkly Rep. 2011;59:1673-77.

29.Vaishya R, Agarwal AK, Vijay V, Hussaini M, Singh H. Surgical Management of Musculoskeletal Injuries after 2015 Nepal Earthquake: Our Experience. Cureus. 2015;7:e306.

30.A N, Khan WS, J P. The Evidence-Based Principles of Negative Pressure Wound Therapy in Trauma & Orthopedics. TOORTHJ. 2014;8:168-77.

31.Rogers AD, Wallace DL. Concerns Regarding the Use of Negative Pressure Wound Therapy After Fasciotomy for Compartment Syndrome. Journal of Burn Care & Research. Published online April 26, 2025:iraf066.

32.Lee P. Treating Fasciotomy Wounds with Negative Pressure Wound Therapy with Instillation and Dwell Time (NPWTi-d). Cureus. 2016;8:e852.

33.Usuda D, Shimozawa S, Takami H, et al. Crush syndrome: a review for prehospital providers and emergency clinicians. J Transl Med. 2023;21:584.

34.Kaya B, Balal M, Seyrek N, Mete B, Karayaylali I. Hemodialysis Experience After Kahramanmaraş Earthquake. J Clin Med. 2024;13:6610.

35.Alpar S, Yilmaz S, Buyurgan ÇS, Yarkaç A, Suzer NE, Tatlıparmak AC. External validation and comparison of SAFE QUAKE and dialysis score in earthquake related crush injuries. BMC Emerg Med. 2025;25:164.