

What We Learned in the Short Term From the 2023 Kahramanmaraş Earthquakes in Terms of Orthopedic Trauma: A Brief Literature Review

2023 Kahramanmaraş Depremlerinden Ortopedik Travma Açısından Kısa Dönemde Neler Öğrendik: Kısa Bir Literatür Derlemesi

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ABSTRACT

In this article, we have attempted to briefly review retrospective research articles related to Orthopedics and Traumatology in the context of the earthquakes centered in Kahramanmaraş to date.

Key Words: Kahramanmaraş Earthquake, Musculoskeletal, Injury, Orthopedics, Trauma, Fasciotomy, Crush Syndrome, Amputation, Compartment Syndrome, Epidemiology

ÖZET

Bu yazıda Kahramanmaraş merkezli depremler bağlamında bu güne kadar olan dönemde Ortopedi ve Travmatoloji konulu geriye dönük araştırma makalelerini kısaca gözden geçirmeye çalıştık.

Anahtar Kelimeler: Kahramanmaraş depremi, Kas-iskelet sistemi, Yaralanma, Ortopedi, Travma, Fasiyotomi, Ezilme sendromu; Amputasyon, Kompartman sendromu, Epidemiyoloji

The earthquakes in Kahramanmaraş/Pazarcık on February 6th, followed by those centered in Kahramanmaraş/Elbistan, have been deemed the most severe natural disasters in the history of the Republic of Turkey. Every major disaster deserves retrospective studies, enabling us to learn how to enhance emergency healthcare services after such events. Many injuries that allow for survival in an earthquake are orthopedic injuries. Consequently, orthopedic surgeons play a pivotal role in providing care for earthquake victims. If the demographic characteristics and clinical outcomes of orthopedic injuries after an earthquake are known, reporting these information would be useful to develop policies and guidelines for management, response and recovery strategies for future disasters [1-2].

After previous earthquakes in our country, some problems in terms of demographic and clinical data of patients, organization and coordination were reported. However, after the Kahramanmaraş-centered earthquakes, it became evident that these lessons were not utilized sufficiently and the necessary lessons were not implemented effectively [1].

The most substantial obstacle to improving healthcare interventions after disasters is the challenge of collecting accurate data. For all that, in order to take the necessary precautions against future earthquakes, earthquake-related data should be collected, meticulously analyzed and published [1]. In this article, we have attempted to briefly

Received Date: 14.10.2023 / Accepted Date: 27.10.2023 / Published (Online) Date: 29.10.2023

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To cited: Aslan A, Zengin Ç, Büyükceran İ. What we learned in the short term from the 2023 Kahramanmaraş Earthquakes in terms of Orthopedic Trauma: A brief literature review. Acta Med. Alanya 2023;7(2): 105-107 doi: 10.30565/medalanya.1376079



review the retrospective research articles about orthopedics and traumatology in the context of the earthquakes centered in Kahramanmaraş to date.

Some controversial issues come to the fore in previous reports written after earthquakes in our country and around the world and in meetings held after the Kahramanmaraş earthquake. These include the timing of fasciotomy, when and how to decide on limb salvage or amputation for specific patients, and whether fractures in limbs without life-threatening injuries should be treated immediately or deferred/transferred in earthquake-affected areas. Other important issues include the timing of procedures such as fasciotomy, amputation, external and internal fixation, wound care, closure, antibiotic therapy, support therapies for crush syndrome (such as fluid and dialysis), approaches to children, the elderly, and young patients, and differences in the approach to upper and lower extremity injuries. These issues require further research reports.

For this editorial short review, articles related to earthquakes have been searched on PUBMED and Google Scholar databases using the keywords "Kahramanmaraş earthquake, musculoskeletal, injury, orthopedics, trauma, fasciotomy, crush syndrome, amputation, compartment syndrome, epidemiology" from the Kahramanmaraş earthquakes of February 6th until the short term. Research articles were reviewed and as far as we could investigate, a total of 12 research articles in the format of orthopedic trauma, authored by at least one orthopedic surgeon were accessed. To the best of our evaluation, these studies covered topics related to epidemiology, demographics, organization, triage, crush syndrome, fasciotomy, amputation, wound care, and wound closure.

Regarding the issues mentioned above that are considered controversial and/or require more research reports, experiences related to certain topics have been shared in retrospective studies conducted after the earthquakes centered in Kahramanmaraş [3-14]. In research studies presenting epidemiological and demographic data after the Kahramanmaraş earthquakes, Asfuroğlu ZM et al. [3] reported significant changes in the patient admission procedures at orthopedic and traumatology clinics after the earthquake, with an increase in the number of international patients and trauma-related diagnoses. Gök M et al. [4] observed that the most intensive period of emergency room admissions occurred within the first 24 hours after the earthquake, and the peak period for surgical procedures was within 24-48 hours. They also noted that crush syndrome was the most common cause of death. Kulaçoğlu B et al. [5] reported that the highest patient influx occurred within the first 24 hours after the earthquake, with isolated soft tissue injuries and fractures being the most frequent injuries related to high-energy trauma. Ak-

kaya M et al. [6] reported that during the initial five days, the majority of patients were young adults. A total of 173 orthopedic surgeries were performed, including internal/external fixation, upper/lower extremity fasciotomy, amputation, and soft tissue debridement.

In studies related to organization and triage, Özdemir G et al. [7] reported that patient data were archived using applications like WhatsApp, and patient interventions were carried out in a team-based, multi-disciplinary approach coordinated by a consulting orthopedic surgeon. They emphasized that a triage system utilizing effective communication and organization strategies could be beneficial in future disasters. Özel M et al. [8] found that the Mangled Extremity Severity Score (MESS) might be useful in predicting amputations in patients transferred to centers following limb crushing injuries in major earthquakes. Regarding crush syndrome, fasciotomy, and amputation, Kundakci B et al. [9] stated that the timing of fasciotomy should not be delayed and emphasized that amputation was life-saving in cases of severe lower extremity injuries. Bingol O et al. [10] highlighted that the risk of amputation increased with the duration of rescue from debris and that delayed fasciotomies were associated with a higher amputation risk. Furthermore, Yalın M et al. [11] reported that in adults and pediatric patients with acute kidney injury due to crush syndrome, there was no increase in the risk of death after fasciotomy. They found that the number of fasciotomy incisions was associated with the development of sepsis and that the frequency of crush syndrome and mortality rates were relatively low in pediatric patients. Kilic E et al. [12] reported that the MESS score was a useful scoring system for determining the level of amputation after trauma but that hyperbaric oxygen therapy did not change the level of amputation in patients who underwent fasciotomy. In studies related to wound care and closure, Ulusoy S et al. [13] indicated that methods such as debridement creams containing collagenase, wound and skin antiseptics, negative pressure wound therapy, and hyperbaric oxygen therapy could provide satisfactory results in the short term for earthquake-related wound care and treatment. Kılıçarslan K et al. [14] reported that in patients with cruris fasciotomy due to acute compartment syndrome, vacuum-assisted closure required more grafts and increased treatment costs compared to the subcuticular polydioxanone method.

The studies of our colleagues summarized above have undoubtedly made significant contributions to our current knowledge. However, when we examine articles related to earthquakes, both from our country and abroad, it is observed that information regarding patient records and long-term follow-up of patients are insufficient. Therefore, we do not have reliable and detailed data on the long-term follow-up of patients who developed crush syndrome af-

ter the earthquake, underwent limb-salvage treatment, or amputation. Again, there are insufficient records regarding patients who developed renal failure after limb-sparing treatment and experienced serious morbidity [15]. Therefore, injuries caused by earthquakes centered in Kahramanmaraş require long-term research in terms of both orthopedic and other medical disciplines.

Finally, physical and mental rehabilitation of earthquake victims with orthopedic injuries is also very important and it is necessary to work in cooperation with relevant experts on this issue [1]. Furthermore, researchs on rehabilitation and prosthetic applications for earthquake-related amputations, as well as rehabilitation for earthquake-related limb injuries, spinal cord injuries, and peripheral nerve damage, is important.

After this disaster we experienced, it became clear that the process should be reviewed and all our colleagues should be updated scientifically regarding patient management in earthquake injuries, with the awareness that we live in an earthquake-prone region. We can update our knowledge with the scientific research reports of our colleagues working on this subject.

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

Funding sources: The authors declared that this article received no financial support.

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