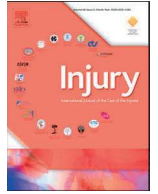


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Missed hand and forearm injuries in multiple trauma patients: An analysis from the TraumaRegister DGU®

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ABSTRACT

Purpose: Multiple trauma patients have a high risk of missed injuries. The main point of our study was to provide new epidemiological data on hand and forearm injuries in multiple trauma with a focus on those that were missed. Therefore, we used the database of the TraumaRegister DGU®.

Methods: In this study, we evaluated anonymous data from 139931 patients aged 1–100 years with multiple trauma in the TraumaRegister DGU® of the German Society for Trauma Surgery from 2007 to 2017. Patients with hand and forearm injuries documented during hospital stay were identified and analyzed. We included fractures, dislocations, tendon injuries, nerve injuries and vessel injuries. Patients with missed hand and forearm injuries were compared with patients with primary diagnosed injuries in view of gender, age, ISS, Abbreviated Injury Score (AIS), Glasgow Coma Scale (GCS), Glasgow Outcome Scale (GOS), trauma mechanism type of injury, hospital stay, RISC II and mortality rate. Missed injuries were defined as injuries that were recently diagnosed and documented in the intensive care unit (ICU).

Results: A total of 50459 multiple trauma patients (36.1%) had hand or forearm injuries, and 89472 patients (63.9%) had neither. Patients with hand injuries were younger and were more often involved in car and motorcycle accidents. Severe head trauma was evaluated less frequently, and severe thorax trauma was evaluated more often in patients with hand injuries.

The times of diagnosis of hand injuries were documented in 10971 cases. A total of 727 patients (6.6%) with missed hand injuries were registered. The most commonly missed injuries in multiple trauma were 104 carpal fractures/dislocations (11.2%), 195 nerve injuries (25.4%) and 54 tendon injuries (11.4%). Predisposing factors for missing injuries were multiple diagnoses, primary care in the first hospital and direct from emergency room transfer to the ICU.

Conclusion: In contrast to previous findings, severely injured patients, especially those with head injuries and GCS of ≤ 8 , were not predisposed to have missed hand injuries compared to patients without severe head trauma. Special attention should be paid to younger patients after traffic accidents with multiple diagnoses and direct transfer to the ICU.

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Introduction

Hand and forearm injuries are relatively common in patients with multiple trauma [1]. Up to 25% of multiple trauma patients

have hand and wrist injuries [2]. Generally, hand injuries are not life-threatening, but they can cause chronic pain, functional impairment, affect quality of life and complicate return to work [3].

According to Advanced Trauma Life Support (ATLS) guidelines, life-threatening injuries are diagnosed during the primary survey [4], while all other injuries are generally evaluated in the secondary survey during emergency room management [5]. Minor injuries, such as hand injuries, can be missed during primary and secondary surveys [6,7]. Despite having no general definition [8], a

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