Abstract

Title: *Modern Methods of Functional Rehabilitation in the Post-Traumatic Hand with Multiple Injuries*

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Background:

Complex post-traumatic hand injuries involving multiple anatomical structures lead to significant impairments in ROM, grip strength and overall function, with a substantial impact on quality of life. The optimal timing for initiating rehabilitation remains controversial, particularly regarding early postoperative rehabilitation versus conventional approaches.

Methods:

This study included 90 patients treated between July 2023 and July 2025 at the Emergency Clinical Hospital of Bucharest. Conventional rehabilitation was applied in 26 patients, while 64 patients followed an early rehabilitation protocol initiated immediately postoperatively. Patients were evaluated at baseline, 4 weeks, and 12 weeks using Total Active Motion (TAM), grip strength (Jamar dynamometer), pain (VAS), edema (figure-of-eight method), functionality (QuickDASH), and anxiety (GAD-7). A comparative analysis between the two approaches was performed.

Results:

Both rehabilitation strategies resulted in significant improvements across all parameters. However, early rehabilitation was associated with superior outcomes in functionality and quality of life, despite higher initial levels of pain and anxiety. Subgroup analysis revealed different recovery patterns depending on the type of injury.

Conclusions:

Early controlled rehabilitation, adapted to tissue healing and patient-specific characteristics, represents an effective and evidence-based approach for optimizing functional outcomes in patients with complex post-traumatic hand injuries.

Keywords: early rehabilitation, post-traumatic hand, complex injuries, function, quality of life.