

Functional Outcomes of Early Active Vector Adjustable Skin Traction in Phalanx Fractures

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Abstract

Background: Intra-articular pilon fractures of the phalanges are complex injuries with high complication rates and often poor functional outcomes. Traditional treatment methods, including surgical fixation and static traction, can be associated with several limitations. This case series introduces Early Active Vector Adjustable Skin Traction (EAVAST) as a novel, non-invasive approach aimed at improving functional recovery while minimizing complications.

Methods: A retrospective review was conducted of patients with unstable intra-articular phalangeal pilon fractures treated using the EAVAST technique. The method involves adjustable skin traction allowing early, active range of motion under controlled loading conditions. Key outcome measures included joint range of motion, grip strength, and radiographic alignment. Patient adherence and device-related complications were also evaluated.

Results: Twenty-one patients with pilon fractures were treated with EAVAST. Most cases demonstrated satisfactory fracture healing without the need for open reduction or internal fixation. Patients achieved an increase in range of motion and returned to functional hand use within weeks of injury. No major complications were observed. Patient-controlled adjustability and early mobilization were identified as key factors contributing to favorable outcomes.

Conclusions: EAVAST appears to be a safe, effective, and low-resource alternative for managing complex intra-articular phalangeal fractures. It facilitates early mobilization, avoids surgical fixation and empowers patients to participate actively in their recovery. Further prospective studies with larger cohorts are warranted to validate these findings and explore broader applications.