

**Recovery and Functional Outcome After Radial Nerve Palsy in Adults with a Humeral Shaft Fracture: A Multicenter Prospective Case Series***Saskia Heleen Van Bergen; Esther M.M Van Lieshout, PhD MSc;**Michael H.J. Verhofstad, MD, PhD, FIOTA; Dennis Den Hartog, MD PhD;**HUMMER Investigators*

**Purpose:** The consequences of radial nerve palsy associated with a humeral shaft fracture are unclear. The aim of this study was to examine the functional recovery of radial nerve palsy in patients with a humeral shaft fracture.

**Methods:** All patients followed in the HUMMER study, a multicenter prospective cohort study including 390 adult patients with a closed humeral shaft fracture type AO type 12A or 12B, who had either radial nerve palsy at presentation or postoperative radial nerve palsy, were extracted from the HUMMER database. Data consisted of treatment and recovery of radial nerve palsy, functional outcome (Disabilities of the Arm, Shoulder and Hand (DASH) and the Constant-Murley score), pain level, health-related quality of life (Short Form-36 [SF-36] and EuroQoL-5 Dimensions-3 Levels [EQ-5D]), activity resumption, and range of motion (ROM) of the shoulder and elbow joint) at 12 months after trauma.

**Results:** Three of the 145 nonoperatively treated patients had radial nerve palsy at presentation. One recovered spontaneously and one after osteosynthesis. Despite multiple surgical interventions, the third patient did not recover radial nerve function after entrapment between fracture fragments. 13 of the 245 operatively treated patients had radial nerve palsy at presentation; all recovered. Nine other patients had postoperative radial nerve palsy of which 8 healed uneventfully. One had ongoing recovery at the last follow-up, after nerve release and suture repair due to entrapment under the plate were performed. One year after trauma, the functional outcome scores of all patients suggested full recovery regarding functional outcome (DASH and Constant-Murley score), pain, quality of life, activity resumption, and ROM.

**Conclusion:** Radial nerve palsy in patients with a humeral shaft fracture at presentation or postoperatively functionally recovers in 94% and 89%, respectively.