

## Recovery After Neurologic Injury in Operative Acetabular and Pelvic Fractures: Defining the Natural History

*Phillip M. Mitchell, MD; Colby C. Wollenman, MD; Cade Morris, MD; Claudia Davidson, MPH; Jacquelyn S. Pennings, PhD*

**Purpose:** We sought to define the natural history of foot drop following operative acetabular and pelvic injuries to provide prognostic data to inform patients and guide treatment.

**Methods:** A retrospective chart review was conducted at a Level I tertiary referral center from 2000-2021 using CPT codes for pelvic and acetabular surgery and the keywords “foot drop” [OR] “footdrop” [OR] “AFO” [OR] “EMG” to identify patients with neurologic injury in the setting of operative acetabular and/or pelvic ring trauma. Patients were included if they had documented, graded weakness not clearly explained by a concomitant injury (extremity or spine) following a pelvic/acetabular injury. Patients were followed to a minimum of 6-month follow-up or to neurologic recovery. Outcomes included the presence and time to recovery of motor and/or sensory function, and ultimate interventions regarding persistent deficits.

**Results:** We identified 121 patients with neurologic injury. In this cohort, 63 patients (52.1%) showed no improvement in their neurologic examination at final follow-up. In the patients demonstrating improvement in their palsy (n = 58, 47.9%), 44 (75.8%) improved to functional or full strength. In those patients with an initial complete palsy, patients showed functional, subfunctional (lack of antigravity), and no recovery in 30.8%, 13.5%, and 55.8%, respectively. Patients with at least initial flicker strength demonstrated recovery of functional strength in 70.6% and no improvement in 29.4%. Of the 69 patients with acetabular injuries, 25 (36.2%) improved to a functional level of strength, with 8 (11.6%) achieving full strength. Of 35 patients with pelvic injuries, 13 (37.1%) improved to functional strength, with 7 (20%) achieving full strength. Finally, of 16 patients with ipsilateral combined pelvic/acetabular injuries, 10 (62.5%) had no improvement and 6 (37.6%) demonstrated functional improvement. Median time to initial improvement was 96 days (interquartile range [IQR] 46-249), and median time to maximum recovery was 208 days (IQR 129-495).

**Conclusion:** These results highlight the relatively poor prognosis for neurologic recovery in operative pelvic/acetabular injuries. The findings further yield prognostic data regarding expected timing of recovery and impact of injury type and initial palsy severity on expected degree of recovery.