Do Extra-Articular Lower Extremity Injuries Perform Better Than Articular Fractures in Physical Performance Tests 12 Months After Injury?

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Purpose: Lower extremity fractures (LEFs) with articular involvement are historically associated with poor patient-reported outcomes while extra-articular injuries are often thought to do well. We sought to determine the impact that LEF with articular involvement has on physical performance in both injured and non-injured limbs at 12 months from injury. We hypothesized that extra-articular fractures would be associated with improved physical function when compared to LEFs with articular involvement.

Methods: An observational cohort study of 120 patients (43.9 ± 15.6 years) with an LEF requiring surgical fixation were recruited from a Level I trauma center. At 12 months post-injury single leg step down (SLSD), single leg calf-raises, leg abduction strength, gait characteristics via Loadsol, rate of torque development (RTD), and peak torque were assessed. Paired t-tests were performed to compare the objective performance of injured to uninjured limbs. A mixed model comparing articular involvement and injured/non-injured limb was performed to evaluate the influence of the injury type on the injured/non-injured limb.

Results: 100 subjects (83%) completed this study. No significant interaction was identified between articular involvement and physical performance of the injured limb for all measures with exception of single leg calf raise (SLSD: $F(1,121) = 3.36$, $P = 0.069$; RTD: $F(1,77) = 0.193$, $P = 0.662$; total loading: $F(1,107) = 2.02$, $P = 0.158$; peak force: $F(1,108) = 0.88$, $P = 0.351$; single leg calf raise: $F(1,121) = 4.12$, $P = 0.045$). A significant interaction in physical performance was identified between uninjured and injured limb (SLSD: –9.12 ± 11.60 95% confidence interval [CI] = 7.06-11.18; single leg calf raise: –4.71 ± 6.73 [3.51-5.90]; RTD: –0.83 ± 1.71 [0.45-1.21]; loading rate: –8.23 ± 21.64 [4.15–12.30]; peak force: –0.34 ± 1.11, [0.14–0.55]).

Conclusion: Extra-articular fractures do not appear to impart a substantial improvement in objective performance measures in the ipsilateral limb 12 months after surgical fixation. Regardless of articular injury, all patients demonstrate a significant difference between objective physical performance in their uninjured limb compared to the injured limb. These data highlight the impact that all types of injuries have on contralateral limb functioning, suggesting that extra-articular injuries should not be overlooked and all types should receive targeted rehabilitation interventions to both extremities.