

## Operative Management of Stress-Positive Minimally Displaced Lateral Compression Type 1 Pelvic Ring Injuries: Analysis of Outcomes Before and After Implementation of a Departmental Stress Protocol

*Nicholas Jerome Tucker, BS; Cyril Mauffrey, MD; Joshua A. Parry, MD  
Denver Health Medical Center, Denver, Colorado, UNITED STATES*

**Purpose:** Our objective was to compare the hospital course of patients with minimally displaced (<1 cm) lateral compression type 1 (LC1) injuries treated before and after implementation of a departmental protocol utilizing lateral stress radiographs (LSRs) to determine management.

**Methods:** This retrospective review of a prospectively collected database identified patients with isolated LC1 injuries that were managed before (n = 33) and after (n = 40) implementation of LSR to determine treatment. All patients in the pre-stress cohort were managed nonoperatively, while patients in the LSR cohort were managed operatively if stress-positive ( $\geq 1$  cm displacement on LSR) and nonoperatively if stress-negative. Primary outcomes were ability to clear physical therapy (PT) for discharge, discharge location, and hospital length of stay (LOS).

**Results:** The pre-stress and LSR protocol groups were similar in demographic / injury characteristics (age, sex, mechanism, American Society of Anesthesiologists (ASA) score, Nakatani classification, bilateral / unilateral injury, Denis zone, sacral fracture completeness, sacral comminution). The LSR protocol group was more likely to clear PT by discharge (97.5% vs 75.8%, proportional difference [PD]: 21.7%, 95% confidence interval [CI]: 5.1% to 36.8%,  $P = 0.009$ ), less likely to discharge to a rehabilitation facility (2.5% vs 18.2%, PD: -15.7%, CI: -30.0% to -0.5%,  $P = 0.04$ ), and had no difference in LOS (median difference [MD]: 0, CI: -1 to 1,  $P = 0.57$ ). 55.0% of LSR protocol patients (n = 22) were stress-negative and managed nonoperatively. 100% of stress-negative patients were able to clear PT by the third day of admission. When compared to patients in the pre-stress group that were able to clear PT by the third day of admission, stress-negative patients did not differ in patient / injury characteristics or primary outcomes. 45.0% of LSR protocol patients were stress-positive (n = 18) and managed operatively. When compared to patients in the pre-stress group who were not able to clear PT by the third day of admission, the operative LSR group was more likely to clear PT (94.4% vs 50.0%, PD: 44.4%, CI: 13.4% to 66.6%,  $P = 0.006$ ), less likely to discharge to a rehabilitation facility (5.6% vs 37.5%, PD: -31.9%, -55.0% to -2.8%,  $P = 0.03$ ), and had a trend of a shorter LOS (MD: 1, CI: 0 to 2,  $P = 0.13$ ).

**Conclusion:** Implementation of a LSR protocol to determine management of minimally displaced stress-positive LC1 injuries was associated with increased rates of operative management, PT clearance by discharge, and a reduction in the number of patients discharging to rehabilitation facilities. Further research is required to determine the implication of the LSR protocol in post-hospital outcomes.