Surgical Complications After Operative Fixation of Minimally Displaced Lateral Compression Type 1 Pelvic Ring Fractures

Joshua A. Parry, MD, MS*; Yong-Cheol Yoon, MD, PhD; Ye Joon Kim, MD; Cyril Mauffrey, MD; Nicholas J. Tucker, MD*

Purpose: Surgical fixation of minimally displaced (<1 cm) lateral compression type 1 (LC1) pelvic ring fractures is controversial. While no significant benefit in long-term outcomes has been demonstrated, some authors argue that short-term improvements in pain and ability to mobilize may benefit some patients. The purpose of this paper was to review surgical complications after fixation of these injuries and to evaluate risk factors for these complications in order to better counsel patients with these injuries.

Methods: A retrospective review identified 299 patients with minimally displaced (<1 cm) LC1 pelvic ring injuries treated at a single Level I trauma center. Operative fixation was performed in 108 patients based upon stress radiographs and/or ability to mobilize. Surgical complications were reviewed along with additional procedures. Patient characteristics, fracture morphology, and fixation constructs were reviewed to determine if these were associated with the development of complications.

Results: The median patient age was 52.5 years (interquartile range 30.7 to 71.7), 58.3% (n = 63) were women, and 59.3% (n = 64) were high-energy injuries. Of the 108 patients who received operative fixation, 98 had percutaneous screw fixation of the posterior ring (87 had single screws and 11 had 2 screws). Anterior fixation was utilized in 78 patients, 74 of which were percutaneous rami screws; the remainder were treated definitively with 3 external fixators and 1 plate. The surgical complication rate was 18.5% (20/108), including hematomas/bleeding (7.1%, n = 7), rami screw loosening (5.1%, n = 5), symptomatic transsacral screws (4.0%, n = 4), fixation failure with loss of reduction (3.1%, n = 3), and iatrogenic L5 nerve injury (1.0%, n = 1). Additional procedures occurred in 9.3% (10/108), including revision fixation for loss of reduction (2.0%, n = 2), loose rami screw removal (3.1%, n = 3), symptomatic transsacral screw removal (3.1%, n = 3), and embolization for bleeding (2.0%, n = 2). Patients who had complications were more likely to be female (80.0% vs 53.4%, P = 0.04) but otherwise did not differ in age (P = 0.67), ISS (P = 0.10), body mass index (P = 0.56), American Society of Anesthesiologists classification (P = 0.29), bilateral rami fractures (P = 1.0), displacement on stress radiographs (P = 0.37), high-energy injuries (P = 0.80), days to surgery (P = 0.76), posterior fixation (P = 0.35), anterior fixation (P = 0.38), retrograde rami screws (P = 1.00), rami comminution (P = 0.43), or parasymphyseal rami fractures (P = 0.76).

Conclusion: Operative fixation of minimally displaced LC1 pelvic ring fractures had a high complication and additional procedure rate. Female gender was the only variable evaluated that was associated with complications. These data can be used for counseling patients considering operative fixation of these controversial injuries.