

# Combined Anterior-Posterior Versus Posterior-Only Fixation of Stress-Positive Minimally Displaced Lateral Compression Type 1 (LC1) Pelvic Ring Injuries

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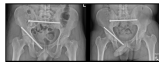
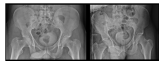
**INTRODUCTION:** Operative management of minimally displaced (<1 cm) lateral compression type 1 (LC1) pelvic ring injuries with dynamic displacement of ≥1 cm on stress radiographs is controversial. Proponents of operative management of these injuries cite potential benefits in pain control, mobilization, hospital length of stay, and ability to discharge home. Percutaneous screw fixation of the posterior ring followed by repeat stress examination to determine the necessity of anterior ring fixation has been previously demonstrated to be a successful management strategy in terms of preventing late fracture displacement. As the main proposed benefit of fixation is thought to be an improved early recovery, a strategy that maximizes pelvis stability may be more beneficial, however. In our practice, we have observed patients who do not appear to benefit significantly from posterior-only fixation. Therefore, the purpose of this study was to compare hospital outcomes and late displacement between stress-positive minimally displaced lateral compression type 1 (LC1) pelvic ring injuries treated with combined anterior-posterior versus posterior-only fixation.

**METHODS:** Retrospective review of a prospectively collected database identified patients with *isolated* stress-positive LC1 pelvic ring injuries treated with combined anterior-posterior (n=25) or posterior-only (n=10) fixation at an urban level one trauma center. Primary outcomes included physical therapy (PT) clearance, discharge location, hospital length of stay, inpatient morphine equivalent doses (MED), and fracture displacement at follow-up.

**RESULTS:**

Groups were similar in demographic and injury characteristics (age, high energy mechanism, ASA score, stress displacement, and rami/sacral fracture classifications). Anterior-posterior fixation resulted in longer operative times (median difference (MD): 27.0 min., 95% confidence interval (CI): 17.0 to 40.0, p<0.0001) and had a trend of increased estimated blood loss (MD: 10 mL, CI: 0 to 30, p=0.07). Patients with anterior-posterior fixation required less inpatient MEDs (MD: -180.0, CI: -341.2 to -15.0, p=0.02), were more likely to clear PT by discharge (100% vs. 70%, proportional difference (PD): 30%, CI: 2.0% to 57.2%, p=0.02), were less likely to discharge to rehabilitation facilities (0% vs. 30%, PD: 30%, CI: 2.0% to 57.2%, p=0.02), and had a trend of less days to clear PT after surgery (MD: -1, CI: -2 to 0, p=0.09) and decreased LOS (MD: -1, CI: -4 to 1, p=0.17). Late fracture displacement did not differ between groups.

**DISCUSSION AND CONCLUSION:** Evidence surrounding differences in outcomes between fixation constructs for LC1 pelvic ring injuries is limited. This study is the first to examine the early outcomes of posterior-only versus combined anterior-posterior fixation constructs for isolated, minimally displaced LC1 pelvic ring injuries with dynamic instability. Combined anterior-posterior fixation was associated with reduced inpatient opioid use and an increased number of patients who could clear PT and discharge home.



**Figure 1**  
 Figure 1 shows the preoperative AP and lateral views of the right hemipelvis in a patient with an isolated LC1 pelvic ring injury. Figure 2 shows the postoperative AP and lateral views of the right hemipelvis in the same patient after posterior-only percutaneous screw fixation. Figure 3 shows the postoperative AP and lateral views of the right hemipelvis in a patient with an isolated LC1 pelvic ring injury after combined anterior-posterior fixation. Figure 4 shows the postoperative AP and lateral views of the right hemipelvis in a patient with an isolated LC1 pelvic ring injury after combined anterior-posterior fixation. Figure 5 shows the postoperative AP and lateral views of the right hemipelvis in a patient with an isolated LC1 pelvic ring injury after combined anterior-posterior fixation.

Variable	AP (n=25)	PO (n=10)
Age (mean)	45.2	46.1
Gender (M/F)	18/7	7/3
ASA (mean)	2.8	2.9
Operative Time (min) (MD)	120	93
Estimated Blood Loss (mL) (MD)	10	0
Inpatient MEDs (MD)	-180	0
PT Clearance (%)	100	70
Discharge to Home (%)	100	30
Discharge to Rehab (%)	0	30
LOS (days) (MD)	-1	0
Late Displacement (%)	0	0

Outcome	AP (n=25)	PO (n=10)
PT Clearance	25/25 (100%)	7/10 (70%)
Discharge to Home	25/25 (100%)	3/10 (30%)
Discharge to Rehab	0/25 (0%)	3/10 (30%)