

## Determining the Role of Posterior Pelvic Ring Fixation Density in Postoperative Pelvic Ring Displacement

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**Purpose:** We sought to determine if posterior pelvic ring fixation density affects postoperative pelvic ring displacement. We hypothesized that greater posterior pelvic ring fixation density leads to less postoperative pelvic ring displacement.

**Methods:** A retrospective chart review was performed for all patients who underwent surgical fixation of pelvic ring injuries. Patients were included if they had an anterior-posterior preoperative, same day postoperative, and 6-month follow-up plain films of the pelvis available. Measurements were made according to the methodology previously described by Keshishyan. We stratified our cohort into categories based on the presence of sacroiliac (SI) or transsacral transiliac (TS) screws: (0 SI: 0 TS, 1 SI: 0 TS, 1 SI: 1 TS, 0 SI: 1 TS, 0 SI: 2 TS, 2 SI: 0 TS, and finally 2 SI: 1 TS). Change in pelvic displacement was determined by subtracting the displacement at final follow-up from the displacement measurement immediately following fixation. Significance was set at  $P < 0.05$ .

**Results:** 279 patients met our inclusion and exclusion criteria. Average age was  $45 \pm 19$  years. Average time of radiographic final follow-up was  $1.3 \pm 7$  years. Average change in displacement was  $1.0 \pm 6.5$  mm. The three most frequently observed constructs were: 1 SI: 0 TS (32.6%), anterior only fixation (26.1%), and 2 SI: 0 TS (18.9%). One-way analysis of variance demonstrated no significant difference in preoperative displacement between the 7 groups ( $P = 0.14$ ). Regression analysis found that patients who had (1 SI: 0 TS) screw had significantly less change in displacement when referenced against patients with no posterior constructs (0 SI: 0 TS). No significant difference was found between the remaining constructs and change in displacement when referenced against patients with 0 SI: 0 TS screws. Finally, it should be noted that the number of screws placed in the anterior pelvic ring was nonsignificant in predicting loss of reduction at final follow up.

**Conclusion:** We found that 1 SI screw leads to decreased displacement at final follow-up relative to no posterior fixation, although more dense posterior fixation constructs did not prevent displacement. Traditional fixation methods combined with restricted weightbearing provide adequate restriction to motion of the pelvis. Increased posterior fixation density does not result in decreased pelvic motion.