

Does Operative Intervention Provide Early Pain Relief for Patients with Undisplaced Unilateral Sacral Fractures?

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Purpose: Sacral fractures comprise approximately 75% of pelvic fractures. The most common type is a unilateral sacral injury with anterior impaction of the sacrum. Operative indications are unclear even in undisplaced fractures. One of the drivers of operative management is the belief that fixation will diminish early pain, potentially leading to faster recovery. We designed a multicenter prospective trial to evaluate unilateral sacral fractures that is funded by the OTA. The purpose of this report is to compare the early pain experienced by patients with undisplaced unilateral sacral fractures treated operatively versus those treated nonoperatively.

Methods: Over a 7-year period we offered enrollment to all patients with unilateral sacral fractures in 15 centers. Exclusion criteria were: AP compression injuries as demonstrated by symphyseal dislocation, pregnant patients or prisoners, and those who would not be able to follow up. All fractures were evaluated for location by zone and displacement (in mm) on the standard three views of the pelvis and CT scan. For the purpose of this report, undisplaced fractures demonstrated no displacement on the AP and inlet views. Pain was assessed using a standard visual analog scale (VAS) score of 0-10. Pain “over the last day” in the anterior pelvis and the posterior pelvis were documented at baseline (prior to injury), 24 hours posttreatment (first 48 hours for nonoperative), and 1, 3, 6, and 12 weeks posttreatment or postinjury. We compared the VAS pain at each time point for all patients with data at that visit using group t tests with significance set at $P < 0.05$.

Results: We enrolled 298 patients with undisplaced fractures (average age = 40, average ISS = 13.7) of whom 53% were female. The average body mass index (BMI) was 25.9. The most common mechanisms of injury were motor vehicle accident (51%) followed by fall

from a height (20%). 136 patients were treated nonoperatively and 63 operatively. There were no differences in age, gender, BMI, or mechanism of injury between the groups. ISS was statistically higher in the operative group (16.6 vs 12.8; $P < 0.02$). Nonoperative patients reported 1.6-point average higher pain in the posterior pelvis and 1 point in the anterior pelvis at 24 hours post-treatment or postinjury and 1 point in the anterior pelvis at 1 week. There was no further difference in VAS reported at 3, 6, or 12 weeks.

Conclusion: We sought to evaluate whether operative intervention resulted in early pain relief for patients with undisplaced unilateral sacral fractures from a prospective cohort of patients treated in 16 trauma centers. There was a 1-point increase in anterior pain and a 1.6-point difference in posterior pain reported at 24 hours by the nonoperative group. By 3 weeks there was no difference between the 2 groups that continued through union at 3 months. Internal fixation of undisplaced unilateral sacral fractures does not provide substantial pain relief during union.