Percutaneous Posterior Pelvic Stabilization for Spinopelvic Dissociation: A 20-Year Series of Displaced and Nondisplaced Fracture Patterns

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Purpose: Spinopelvic dissociation is a rare injury pattern. The choice of percutaneous, open, or a combined approach is dictated by displacement, neurologic status, associated injuries, individual surgeon preference, and institutional protocols. We sought to assess the success and complication rate of treating spinopelvic dissociation with percutaneous iliosacral (IS) and/or transiliac-transsacral (TS) screw fixation.

Methods: We identified and reviewed all sacral fractures treated operatively over a 20-year period. From an initial cohort of 156 patients with spinopelvic dissociation, we identified 63 patients treated using percutaneous IS and/or TS screw fixation with a minimum 3-month follow-up. Fracture displacement, kyphosis, and neurologic status were collected. Clinical outcomes were collected through chart review, including evidence of union, hardware failure, wound complications, and reoperation.

Results: 27 patients (43%) had displaced sacral fractures (Roy-Camille 2 or 3) with an average preoperative kyphosis of 31.5°. The remaining fractures (n = 36) were nondisplaced. A variety of fixation constructs were used, ranging from one IS screw placed bilaterally at one sacral segment to three TS screws placed with fixation at multiple levels. 42 patients were neurologically intact (66%), 7 patients had a documented neurologic deficit prior to surgery, and the remaining cases had an unknown neurologic examination prior to surgery. The mean follow-up was 376 days. Radiographic and clinical follow-up demonstrated no cases of fixation failure or nonunion. Four patients (6%) had radiographic evidence of screw loosening, all of whom had fixation with a single IS screw placed bilaterally. All progressed to eventual radiographic and clinical union. Two patients (3%) underwent hardware removal and two patients (3%) had screw breakage at the level of the sacroiliac joint following union. In patients with a documented preoperative neurologic deficit, two patients (29%) had persistent deficits at final follow-up. Neurologic recovery occurred at an average of 202 days (range, 82-363 days). Radicular pain and paresthesias were the most common long-term neurologic complication present among all patients at final follow-up (n = 5, 8%).

Conclusion: Percutaneous treatment of spinopelvic dissociation appears to be safe with a low complication rate and reliable union. In a cohort of displaced fractures with kyphosis that were fixed in situ, we found no cases of late displacement or fixation failure. Fixation with one IS screw placed bilaterally was associated with screw loosening prior to union. Radicular pain and paresthesias were the most common long-term neurologic sequelae.