Use of Porous Ingrowth Implants for Stability and Concurrent Sacroiliac Joint Fusion During Fixation of High- and Low-Energy Posterior Pelvic Ring Injuries

Craig S. Bartlett, III, MD*; John-David Black, MD; Bharat Desai, MD; Timothy Holt; Leo Masari; Gian Luigi Moro; Roberto Mongil Escudero; David Watson, MD*

Purpose: Optimal treatment of sacroiliac joint (SIJ) disruptions and sacral fractures remains undefined, including the role of concurrent SIJ fusion (SIJF). Percutaneous treatment is popular but screw loosening and revision occurs in 20%. Posttraumatic SIJ pain is also recognized with 34% developing chronic pelvic pain and 16% gait disturbances after fixation. SIJF with fracture stabilization may provide more robust constructs, lessen pain, and improve function. Our objective was to evaluate outcomes of patients with operatively treated posterior ring injuries who underwent minimally invasive SIJF at the time of definitive stabilization.

Methods: A retrospective multicenter study identified 50 patients. Classification included Young-Burgess for high-energy (HE) and Bakker for low-energy (LE) injuries. Standard principles were utilized including concomitant iliosacral or transiliac-transsacral screws with (n = 7) or without supplemental anterior fixation. Patients underwent lateral percutaneous placement of 1-3 triangular titanium implants (TTIs) for SIJF. This design provides immediate stability across the zone of injury and porous surfaces for bone ingrowth, providing construct durability. Weightbearing was guided by injury and fixation stability, with most mobilizing as tolerated. Outcome measures included procedure variables, pain scores, and functional and radiographic status at follow-up.

Results: 33 had LE (mean age 74, 84% female) and 17 HE (48, 41% female) injuries. LE types were associated with minor falls (n = 23) or no recalled trauma (n = 10). HE injuries included 2 crush, 3 falls from height, and 11 motor vehicle accidents. Lateral compression was most common in HE; Bakker C3 injuries were most common in LE. Bilateral injury was more common in LE. At follow-up (average 7.9 months LE; 10.6 months HE), pain was minimal (mean visual analog scale 1.9, standard deviation 1.7, P<.0001). Both groups regained pre-fracture mobility (P = 0.18 and 0.68 mobility status change scores). Late imaging (mean 8.7 months, n = 48) showed screw backout in 4 (3 LE and 1 HE) but no TTI migration, breakage, or subsidence. Healing occurred in all but 2 cases.

Conclusion: In our series of 50 patients, fracture fixation with concomitant SIJF was safe and effective for restoration of pain and function in patients with posterior ring injuries.