Percutaneous Lumbopelvic Fixation Without Fusion Is Effective in the Management of Unstable Sacral Fractures

***James D Brodell, BA**; Mark C Lawlor, MD; Gabrielle Santangello; Andrea M.S. Kulp, NP; Ram Haddas, MBA; Addisu Mesfin, MD*

Purpose: Historically, lumbopelvic dissociation has been managed with open lumbosacral fusion and instrumentation. Our aim was to evaluate outcomes and complications following surgical management of lumbopelvic dissociation with percutaneous implants.

Methods: This was a retrospective case series at a single academic Level I trauma center. Patients who had undergone lumbopelvic fixation for lumbopelvic dissociation were included. Patient demographics, mechanism of injury, ISS, associated injuries, radiographic classification (Roy-Camille), estimated blood loss (EBL), Patient-Reported Outcomes Measurement Information System (PROMIS) Pain Interference (PI), Physical Function (PF), and Depression (D), Oswestry Disability Index (ODI), and complications were collected.

Results: 27 patients were enrolled with an average follow-up of 18.7 ± 17.6 months and age of 54.4 ± 25.1 years. All patients underwent lumbar pedicle screw and iliac screw placement. 67% of patients sustained a fall, and 33% were involved in an MVA (motor vehicle accident). 52% were Roy-Camille Type 2, and 32% and 20% were Types 1 and 3, respectively. The mean ISS was 14.4 ± 10.8. Ten patients had no other associated injuries. The mean EBL was 261 ± 400 mL. 37% required concurrent sacral laminectomy for a neurological deficit. There were no intraoperative complications and 4 postoperative complications, including surgical site infection, rod dislodgment, and deep venous thrombosis. 63% underwent removal of instrumentation after fracture healing. ODI scores significantly improved from 6 weeks postoperatively (35.5 ± 4.5) to 1-year follow-up (18.3 ± 9.6, $P = 0.005$), 2-year follow-up (20.3 ± 10.0, $P = 0.03$), and final follow-up (16.4 ± 8.8, $P = 0.002$). Statistically significant improvements were observed in the PROMIS PI, PF, and D domains ($P<0.05$).

Conclusion: This is one of the largest series demonstrating that lumbopelvic instrumentation without fusion is an effective strategy in the management of lumbopelvic dissociation, with improvement in patient-reported outcomes. The combination of percutaneous instrumentation without arthrodesis did not result in fracture nonunion. Percutaneous lumbopelvic fixation for lumbopelvic fixation is a well-tolerated and successful treatment strategy in polytraumatized and geriatric patients alike.