

Retrograde Transpubic Screw Osteosynthesis: Retrospective Analysis of 158 Fractures

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Purpose: Anterior lesions are found in 80% of patients with pelvic ring fractures. Operative stabilization of the anterior ring enhances its stability at about 30%. There is only limited information about clinical outcome and complications using minimally invasive retrograde transpubic screws.

Methods: All consecutive patients treated with a retrograde transpubic screw in a Level-I trauma center from 2003-2017 were included. Patient records and radiographs were studied. Fracture mechanism was classified as high-energy or fragility fracture of the pelvis (FFP). Assessed were: implant loosening, suboptimal positioning, peri-implant infection, hematoma, neurovascular damage, and operative revision. Nonunion was defined as radiographic lack of union after 6 months. Categorical data were compared using χ^2 test; $P < 0.05$ was regarded as statistically significant.

Results: 158 retrograde transpubic screws were implanted in 128 patients; half were in FFPs, half in high-energy trauma. Mean age was 64 ± 21 years, 83 females and 45 males. 63% of the screws ended in the supra-acetabular region. There were 10% early implant-associated complications (suboptimal positioning, peri-implant infection, hematoma); therefore 5% of the screws were revised. There were no neurovascular or urologic complications. After a mean follow-up of 58 weeks, there were signs of loosening in 9%. A nonunion rate of 10% was observed in patients with a minimum follow-up of 6 months; this correlated with a peri-implant infection ($P = 0.001$), operation >6 months after trauma ($P = 0.02$), and nonsignificantly with implant loosening ($P = 0.076$). There was no correlation of nonunion with patient age, the fracture mechanism, or a nonexcellent reduction. In total, 12.5% of the patients were reoperated; in 5.1%, a reosteosynthesis was conducted.

Conclusion: Compared to alternative methods of anterior pelvic ring fixation, retrograde transpubic screws show good clinical results with lower or similar complication rates. Fracture union did not depend on fracture mechanism or age. Hence, this minimal-invasive method is especially attractive in elderly patients with an FFP. Because it is an internal fixation of the superior pubic ramus with relative stability, an anatomic open reduction is not necessary to achieve fracture union.