

Is the Risk of Infection Higher for Anterior Pelvis Plate Fixation in the Presence of a Urethral or Extraperitoneal Bladder Injury?

*Mario Cuadra, MD; Givenchy W. Manzano, MD; Ziqing Yu, MS; Clay A. Spitler, MD; David Albert Patch, MD; Paul Edward Matuszewski, MD; Tyler J. Pease, BS; Andrew Chen, MD; Victoria Garrard, MD; Madhav A. Karunakar, MD; Pelvic Fracture Study Group
Atrium Health, Charlotte, North Carolina, UNITED STATES*

Purpose: Concerns for deep infection following anterior pelvic plate fixation performed in the presence of a genitourinary injury have led some to avoid internal fixation. We report the risk of deep infection after plate fixation in the presence of an extraperitoneal bladder rupture (EPBR), or urethral injury (UI) compared to a cohort with no anterior internal fixation.

Methods: A multicenter retrospective database review of 2571 pelvic fractures from 4 trauma centers identified patients with pelvic fractures that underwent operative fixation in the presence of an EPBR or UI between 2008 and 2018. Demographics collected included age, gender, mechanism of injury (MOI), classification (Young-Burgess, OTA), and presence of a suprapubic tube (SPT). Plate fixation and no anterior internal fixation (external fixation) cohorts were compared for the incidence of deep pelvic infection.

Results: 87 patients with 92 genitourinary injuries were included: 40 (43%) UI and 52 (57%) EPBR, 5 combined. Mean age was 38 years (range, 31-53), majority male (80%), with high-energy MOI (motor vehicle collision 65%,) sustaining lateral compression (29%) or anterior posterior compression (26.5%) pelvic injuries; OTA classification: 61B 43 (49.4%), 61C 24 (27.6%). 44/87 patients (51%) underwent plate fixation. Of the 40 UIs, 17 (43%) underwent plate fixation. Of the 52 EPBRs, 29 (56%) underwent plate fixation. The overall deep infection rate for the entire cohort was 6/87 (7%) with no difference between plate fixation and no internal fixation groups: 2/44 (4.5%) versus 4/43 (9.3%), $P = 0.43$). Analysis based on type of genitourinary injury revealed no difference between plate fixation and no internal fixation for EPBR, 1/29 (3%) versus 0/23 (0%) ($P = 0.99$) and no difference between plate fixation and no internal fixation when UI present, 2/17 (12%) versus 4/23 (17%) ($P = 0.99$). 25/40 UIs (62%) had SPT placed. There was a significant difference in deep infection with SPT presence: 5/28 (18%) versus 1/59 (2%) ($P = 0.013$). 7 SPTs were removed early, 18 delayed, with no difference in infection, 0 versus 5 ($P = 0.27$).

Conclusion: Rate of deep infection was not significantly different for plate fixation and no internal fixation groups in the presence of genitourinary injury (4.5 vs 9.3%). Anterior plate fixation in the presence of UI has an infection rate of 12%, while only 3% for patients with internal fixation and EPBR. A SPT is associated with an increased risk of deep infection, regardless of timing of removal.