

## Does Posterior Pelvic Ring Fracture Location Predict Neurologic or Vascular Injury?

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**Purpose:** Posterior pelvic ring injuries often require a significant amount of force and can lead to major neurologic dysfunction. Denis et al. describe 3 zones associated with sacral fracture patterns that showed some correlation with degrees of neurologic dysfunction but failed to assess the relationship of sacroiliac (SI) joint injury/SI fracture dislocation with neurologic injury. The purpose of this study is to assess the relationship between posterior pelvic ring fracture pattern and associated neurologic and vascular injuries.

**Methods:** A retrospective review was performed of all operative pelvic ring injuries at a single Level-I trauma center over 4 years (2015-2019). Patients were excluded for follow-up less than 3 months or inability to obtain a preoperative neurologic examination. 319 pelvic fractures were included for chart and radiographic review. Neurologic injury was defined as dermatomal sensory disturbance or discrete motor weakness. Vascular injury was defined as any patient requiring angiography or interventional radiology due to their vascular injury. Posterior pelvic ring fracture was described by the Denis classification, SI joint injury, SI joint fracture dislocation, or spinopelvic dissociation pattern.

**Results:** Of 319 total pelvic ring injuries over the 4-year study period, 14.1% of all operative pelvic ring fractures sustained preoperative neurologic injury. There was no association between posterior pelvic ring fracture pattern, unilateral versus bilateral posterior injury, or Young-Burgess classification and neurologic injury. The rate of vascular injury was 16.84% in all fractures. Vascular injury was not associated with Young-Burgess classification or posterior pelvic fracture pattern, but was significantly more common in bilateral versus unilateral posterior injuries ( $P = 0.02$ ).

**Conclusion:** Even though patient survival after pelvic ring fractures continues to increase, the posterior fracture location does not predict neurologic injury. Vascular injuries, however, occur more commonly in bilateral posterior ring fracture as opposed to unilateral fractures. This association can help direct resuscitation and early intervention in these fracture patterns to improve overall patient survival.