

Outcomes and Predictors of Delayed Intervention After Renal Trauma

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Introduction: Historically, a zone II hematoma mandated exploration after penetrating trauma, but this has been challenged given potentially higher nephrectomy rates and the advent of therapeutic endovascular and endoscopic interventions. We hypothesized penetrating mechanism was not a predictor for delayed intervention in the modern era.

Methods: This single-center, retrospective study included renal trauma patients from 3/2019 to 6/2022. Our institutional practice is selective exploration of zone II hematomas for active bleeding and expanding hematoma only, regardless of mechanism. Descriptive statistics and multivariable logistic regression (MLR) were performed.

Results: One-hundred and forty-four patients were identified, with median age 32 years (IQR:23,49), 66% blunt mechanism, and injury severity score 17(IQR:11,26). Forty-three (30%) required operative intervention, and of the 20 that had a zone II exploration, 3 (15%) underwent renorrhaphy and 17 (85%) underwent nephrectomy. Penetrating patients more frequently underwent immediate operative intervention (67%vs10%, $P < .0001$), required nephrectomy (27%vs5%, $P = .0003$), and were less likely to undergo pre-intervention CT (51%vs96%, $P < .0001$) compared to blunt patients. Delayed renal interventions were higher in penetrating (33%vs13%, $P = .004$) with no difference in mortality or length of stay compared to blunt mechanism. Ureteral stent placement and renal embolization were the most common delayed interventions. On MLR, the only independent predictor for delayed intervention was need for initial operative intervention (OR 3.803;95%CI:1.612-8.975, $P = .0023$). Four (3%) required delayed nephrectomy, of which only one underwent initial operative intervention without zone 2 exploration.

Conclusions: The most common delayed interventions after renal trauma were renal embolization and ureteral stent. Penetrating mechanism was not a predictor of delayed renal intervention in a trauma center that manages zone II retroperitoneal hematomas similarly regardless of mechanism.