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### Title

PD46-01 PATIENT CLINICAL AND RADIOGRAPHIC CHARACTERISTICS ASSOCIATED WITH FAILED ANGIOEMBOLIZATION AS FIRST-LINE THERAPY AFTER TRAUMA: RESULTS FROM THE AMERICAN ASSOCIATION FOR THE SURGERY OF TRAUMA GENITOURINARY TRAUMA STUDY

### Permalink

<https://escholarship.org/uc/item/75s852v6>

### Journal

Investigative Urology, 203(Supplement 4)

### ISSN

0021-0005

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### Publication Date

2020-04-01

### DOI

10.1097/ju.0000000000000933.01

Peer reviewed

**Trauma/Reconstruction/Diversion: External Genitalia Reconstruction and Urotrauma (including transgender surgery) II**

**Podium 46**

**Sunday, May 17, 2020**

**9:30 AM-11:30 AM**

**PD46-01**

**PATIENT CLINICAL AND RADIOGRAPHIC CHARACTERISTICS ASSOCIATED WITH FAILED ANGIOEMBOLIZATION AS FIRST-LINE THERAPY AFTER TRAUMA: RESULTS FROM THE AMERICAN ASSOCIATION FOR THE SURGERY OF TRAUMA GENITOURINARY TRAUMA STUDY**

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**INTRODUCTION AND OBJECTIVE:** Nonoperative management strategies for traumatic injuries have been associated with lower hospital costs, earlier discharge, less intra-abdominal complications, & reduced transfusion rates. Angioembolization (AE) has been pivotal in the transition to increased nonoperative management. Despite wide use, trauma-related AE can fail & require additional interventions. This multi-institutional study sought to determine what clinical & radiographic factors associated with AE failure.

**METHODS:** Patients were selected from the Multi-institutional Genito-Urinary Trauma Study (MiGUTS), a collaborative effort between the AAST & the Genito-Urinary Trauma Study Group. This database includes high-grade renal trauma (HGRT; AAST grades III-V) admitted to participating centers between 2-2014 & 2-2017. The inclusion criterion was any HGRT that underwent a diagnostic angiography & subsequently AE for renal and/or non-renal bleeding. This cohort was dichotomized into successful or failed AE. The AE was considered a failure if it was followed by (1) repeat angiography and/or (2) an exploratory laparotomy.

**RESULTS:** A total of 72 patients underwent angiography & 46 subsequently received AE. Among those who underwent AE, 28 of 46 (61%) underwent AE for renal bleeding including 23 exclusively for renal bleeding & 5 for renal & non-renal bleeding. The AE failed for 21 (46%) patients. These patients had higher injury severity scores, renal injury grades, larger transfusion requirements at 4- & 24-hours, & longer hospital & ICU stays ( $p < 0.05$ ). A total of 18 patients underwent renal AE & had initial radiographic data for review with 6 (33%) having a failed renal AE. The failed renal AE group had larger perirenal hematoma sizes.

**CONCLUSIONS:** AE for high-grade renal trauma failed in 46% of patients. This was associated with having more severe renal injuries, larger perirenal hematomas, more additional injuries, & larger transfusion requirements. Likely these characteristics are reflective of the severity of trauma injuries being treated & are probably less amenable to a single AE for effective treatment.

**Source of Funding:** None.

**PD46-02**

**EXTERNAL VALIDATION OF A NOMOGRAM TO PREDICT BLEEDING INTERVENTIONS AFTER HIGH-GRADE RENAL TRAUMA**

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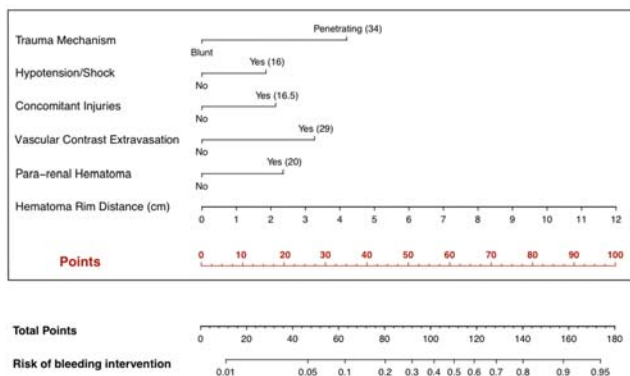
**INTRODUCTION AND OBJECTIVE:** A multi-institutional nomogram incorporating clinical and radiologic factors has been previously developed to predict bleeding interventions after high-grade renal trauma (HGRT). We aimed to externally validate this nomogram using multi-center data from level-1 trauma centers.

**METHODS:** We gathered HGRT (AAST grades III-V) data from 7 Level-1 trauma centers. Patients were included with available initial CT scans. Two radiologists reviewed the images. Nomogram variables included: 1. trauma mechanism; 2. shock (SBP <90 mmHg); 3. concomitant injury (i.e. any solid organ, gastrointestinal, spinal cord, or major vascular injury, or pelvic fracture); 4. vascular contrast extravasation (VCE); 5. pararenal hematoma extension (beyond aorta on left or IVC on right or into the pelvis); and 6. hematoma rim distance (HRD, i.e. largest measure from the edge of the kidney to the hematoma). Bleeding interventions were: nephrectomy (total or partial), renorrhaphy, renal packing, and renal-related angioembolization. Mixed-effect Poisson regression was used to assess the associations. The prediction accuracy of the nomogram was assessed using the area under the receiver operating characteristic curve (AUC) and its 95% confidence interval (CI).

**RESULTS:** A total of 297 HGRT patients with a mean age of  $38.2 \pm 17.3$  years were included. Injuries were grade III, IV, and V in 57%, 37%, and 6%. Trauma mechanism was blunt in 91%. Overall, 70% had concomitant injuries and 21% presented in shock. Using initial CT scans, 13% had VCE and 40% had pararenal hematoma. Mean HRD was  $2.1 \pm 1.6$  cm and 20% had an HRD  $\geq 3.5$  cm. 44 (15%) patients underwent bleeding interventions including 26 angioembolizations and 15 nephrectomies. Presence of VCE was associated with 4.6-fold increase in risk of bleeding interventions (95% CI: 2.51–8.35). Every cm increase in HRD was associated with 43% increase in risk of bleeding interventions (RR:1.43; 95% CI: 1.23–1.66). The prediction accuracy of the nomogram based on the AUC was 0.85 (95% CI: 0.79–0.90).

**CONCLUSIONS:** The prediction accuracy of the proposed nomogram remains high using external data. Predictive tools such as this nomogram can help to better risk stratify renal injuries, identify variables important for interventions, and to potentially reduce the number of unnecessary renal explorations.

The MiGUTS (Multi-institutional Genito-Urinary Trauma Study) nomogram for predicting bleeding interventions after high-grade renal trauma



**Source of Funding:** None