☐ A NOMOGRAM PREDICTING THE NEED FOR BLEEDING INTERVENTIONS AFTER HIGH-GRADE RENAL TRAUMA: RESULTS FROM THE AMERICAN ASSOCIATION FOR THE SURGERY OF TRAUMA (AAST) GENITOURINARY TRAUMA STUDY.

Keihani S, Rogers DM, Putbrese BE, et al. *J Trauma Acute Care Surg*. 2019 Feb 7. doi: 10.1097/TA.0000000000002222

The American Association for the Surgery of Trauma (AAST) has assigned a grading scale for renal injury in trauma that assigns high-grade renal trauma (HGRT) as levels III-V. Some patients with HGRT require surgical management including nephrectomy but many other patients have good outcomes with non-operative management. Currently no guidelines exist to inform management of renal injury based on clinical and radiologic data.

The objective of this study was to create a nomogram to describe likelihood of surgical intervention for bleeding in HGRT. This study collected data on clinical and radiologic factors present in patients with HGRT and whether or not they had a bleeding intervention. These data were collected between 2014-2017 from 14 Level 1 Trauma centers as part of the Genito-Urinary Trauma Study, which was a prospective multi-institutional collaborative effort between AAST and the Trauma and Urologic Reconstruction Network of Surgeons (TURNS). Clinical variables collected for analysis were age, sex, trauma mechanism (blunt vs penetrating), side of renal injury (right, left, bilateral), injury severity score (ISS), hypotension/shock (defined as systolic blood pressure <90 mmHg at any time during the first 4 hours from admission), glascow coma scale (GCS), blood products needed in the first 24 hours, admission lab values, and presence of any concomitant injury (solid organ, gastrointestinal, spinal cord, major vascular, pelvic fracture). Radiologic variables included assessed presence of active bleeding, size and extension of hematoma and laceration location (lateral, medial, complex). Definition of interventions included nephrectomy, partial nephrectomy, renorrhaphy, renal packing and renal angioembolization. For this study, 2 radiologists who were blinded to patient outcomes, intervention and clinical factors assessed the CT scans for radiologic findings. Comparisons were made between the patients who underwent intervention and those who did not. Stepwise regression was performed to discover which variables affected the likelihood of intervention.

326 patients met the clinical and imaging inclusion criteria. Of the included patients, 81% of trauma was blunt and 47 patients (14%) underwent bleeding intervention, including 19 renal angioembolizations and 16 nephrectomies. In the bleeding intervention group there were higher incidences of penetrating injury, higher-grade renal injury, vascular contrast extravasation (VCE) and larger hematomas. In regression, the factors most predictive of bleeding intervention were penetrating mechanism of injury, presence of VCE and increasing hematoma rim distance (HRD). Point values were assigned to the nomogram based on predictive strength of each variable. The sum total of these points ranges from 0 to 180, and this total score corresponds to a likelihood of bleeding intervention (0-100%). The calculated AUC was 0.83 (95% CI: 0.81-0.85), which indicated the nomogram performed better as a predictor for intervention than simply using the AAST grading system alone (AUC 0.69; 95% CI: 0.61–0.77). The nomogram is currently undergoing external validation.

The authors conclude that this nomogram is a novel tool that, compared with the AAST grading system alone, can more accurately predict which patients with HGRT may need a bleeding intervention or who could be managed conservatively. This may be an effective starting point for the standardization of management of HGRT.

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Commentary: Surgical versus conservative management in HGRT has historically been mostly a judgement call. This is the first attempt to assist clinicians in predicting who needs a bleeding intervention in patients who were stable enough to obtain imaging (of note, those who required immediate operative intervention were excluded). If externally validated, this nomogram may be especially helpful for more remote or rural facilities without direct access to Trauma Surgery or Interventional Radiology as it will help inform the decision to transfer for surgical care. Inter-facility transfer carries its own risks and expenses. Both the patient and the healthcare system will benefit from more accurate assessment of which patients need operative versus non-operative management of HGRT.

☐ CLEARING THE CERVICAL SPINE IN PATIENTS WITH DISTRACTING INJURIES: AN AAST MULTI-INSTITUTIONAL TRIAL.

Khan AD, Liebscher SC, Reiser HC, et al. *J Trauma Acute Care Surg*. 2019; 86(1): 28-35

This trial aimed to demonstrate that the cervical spine can be cleared using only the physical examination in the setting of blunt trauma despite the presence of distracting injuries. Single center trials have suggested that clinical examination of the cervical spine in blunt trauma patients with a distracting injury (DI) is a sensitive measure to exclude cervical spine injury, and this study attempted to further validate this conclusion using a multicenter assessment of the sensitivity of clinical examination.

This prospective 42 month study evaluated adult blunt trauma patients at eight level 1 trauma centers using a standardized cervical spine examination. All patients that suffered a blunt mechanism of trauma, were age 18 years or older, and had a glasgow coma scale (GCS) score of 14-15 were enrolled. There were no further exclusion criteria. All patients were questioned and examined, and if no neurological deficits were present, their cervical spine was held in manual stabilization while the standardized physical exam was performed to determine the presence of any pain. The physical examination was performed by either the attending trauma surgeon, the trauma surgery resident, or the trauma surgery APRN. Whether or not the patient had pain, they were potentially placed back into their collar depending on institution protocol, and all patients received computed tomography (CT) imaging of their cervical spine. Only CT scan results interpreted by radiology attendings were used for data collection. Distracting injuries in the study included long bone fractures, skull fractures, facial fractures,