

## What's new in urological trauma? 2012 update

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Urologic trauma continues to be a dynamic and evolving subspecialty of urology. This is evident by the trauma papers published this past year. Highlights of the 2011 literature include a needed revision of renal trauma grading, increased use of large population-based datasets and multiple papers examining the use of angioembolization.

Buckley and McAninch (1) revised the current American Association for the Surgery of Trauma Renal Injury Grading System producing a staging classification that is more clear and straightforward. Grade 1 (renal contusion), grade 2 (<1 cm laceration), grade 3 (>1 cm laceration without collecting system injury) remain unchanged. Grade 4 injuries now include all collecting system injuries. Grade 5 injuries denote major catastrophic vascular injury including main renal artery or vein laceration or avulsion of the main renal artery or vein thrombosis. This classification reflects that most injuries involving the renal parenchyma and segmental vessels can be managed conservatively while hilar injuries frequently will require surgery for salvage.

The majority of manuscripts related to urologic trauma this past year are case reports and case series which in part reflects the low volume of injuries seen at most centers worldwide. Management consensus and practice guidelines continue to be based on large, seminal case series from high volume urologic trauma centers. Increasingly, population-based data sets are being utilized to study urologic trauma epidemiology and outcomes. This trend should continue given the rise and availability of inexpensive, powerful statistical software and large publically accessible data sets. Urologic trauma has lagged other urologic subspecialties such as cancer in the utilization of such data sets.

The National Trauma Data Bank (NTDB) is a robust and publically available data repository. Managed by the American College of Surgeons, the NTDB contains trauma

admissions of participating Level 1-5 trauma centers in the United States, totaling over 600,000 case records. Compared to case series, NTDB has the advantage of drawing from a large and diverse population from all regions of the country. Potential disadvantages include the reliance on administrative data and the inability to reexamine new variables in historical patients.

A number of groups have utilized this data set to study urologic trauma this past year. Bjurlin *et al.* examined over 16,000 bicycle injuries and found GU organs involved 2% of cases (2). The kidneys were the most commonly injured GU organ among bicycle accidents. Among patients who sustained a vertebral fracture, concurrent bladder/urethra (38%) or a renal injury (23%) were common. These bicycle related injuries represent the most severe type as these patients all required hospital admission to be included in the data set. The same group performed an analysis looking at geriatric urogenital trauma (3). They reported that penetrating GU injuries were less common among geriatric patients and that although geriatric patients have similar mean Injury Severity Scores as non-geriatric patients, they had significantly more comorbidities, hospital complications and higher mortality.

Another group used the NTDB to compare the operative and nonoperative management of bladder injury (4). They reported on over 8000 bladder injuries, 54% of which underwent bladder surgery. Of the bladder injuries 14% were intraperitoneal and 86% were extraperitoneal ruptures. Interestingly, only 76% of intraperitoneal bladder ruptures received operative management.

When to use angioembolization in the management of renal trauma has been (5) and continues to be a point of debate. A handful of studies examined the use of angioembolization to treat renal trauma. A group from

Seattle, Washington (6) used the NTDB to explore national practice patterns. Of 9002 renal injuries over a five-year period, only 165 patients (2%) underwent diagnostic angiography after renal injury with 77 undergoing angioembolization. Of concern, 30% of the patients who underwent angioembolization had grade 1 and 2 renal injuries. Strong evidence supports the use of conservative management for low-grade renal trauma. Increased collateral patient harm, renal damage and cost will be incurred with the use of angioembolization for low-grade renal injuries. Furthermore, they found the initial success rate for angioembolization to be low. 88% of patients required some type of secondary intervention, either surgery or repeated embolization. Interestingly, overall renal salvage of high-grade lesions was high with the use of successive angioembolization.

Sarani and colleagues reported on their single institution experience managing blunt renal trauma with either open surgical repair or angioembolization (7). They contend that patients with high-grade renal injuries without other indications for immediate abdominal operation benefit from arteriography and possible embolization. It should be noted that a third of their population had grade 3 injuries which in most cases could have been observed. Finally, a group from Germany reported on 19 patients who required angioembolization most of which were from iatrogenic causes (8). The initial failure rate was 37% with repeat embolization producing a similar failure rate.

We believe that embolization can effectively treat renal injuries that failed conservative management as evident by hypotension or the need for greater than 2 units of blood products. Embolization is not warranted when the patient is going to the operating room for repair of other injuries nor has a low-grade injury (grade 1-3) unless the previous criteria are met. High grade renal injuries that require intervention may be treated with similar success with embolization (most likely repeated) or surgery.

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## Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

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