

Pediatric renal injuries: management guidelines from a 25-year experience

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Purpose: We defined the mechanism and cause of pediatric renal trauma, and developed guidelines for management based on the outcome analysis of operative vs nonoperative management.

Materials and Methods: We retrospectively reviewed 374 pediatric renal injuries at San Francisco General Hospital, comparing operative vs nonoperative management based on clinical presentation, type of renal injury, hemodynamic stability, associated injuries and the results of radiographic imaging.

Results: Blunt trauma accounted for 89% of pediatric renal trauma with a renal exploration rate of less than 2%. Penetrating trauma represented the remaining 11% with a renal exploration rate of 76%. Of grade IV renal injuries 41% were successfully managed nonoperatively based on computerized tomography and staging in hemodynamically stable children. Our overall renal salvage rate was greater than 99%.

Conclusions: Pediatric renal trauma is often minor and observation poses no significant danger to the child. In serious pediatric renal injuries early detection and staging based on clinical presentation and computerized tomography are critical for determining operative vs nonoperative management. Regardless of the type of management the standard of care is renal preservation (less than 1% nephrectomy rate in this series).

Editorial Comment

This series, from the most reliable American center of excellence in GU trauma surgery, is one of the largest pediatric series ever published. The lessons from this series are clear:

1. Most (96%) blunt pediatric renal injuries of low severity (Grades I-III).
2. Overall, 41% of Grade IV injuries were managed nonoperatively (mostly blunt). Even some (24%) penetrating renal injuries were treated nonoperatively.
3. Few patients (1/37 explored, overall 1/374 patients seen) patients required a nephrectomy.
4. Worsening urinary extravasation required stent placement uncommonly—in only 1 case.

Large and authoritative series such as this lend further support for an initial nonoperative approach to most hemodynamically stable renal injuries, even in children. Patients with suspected Grade V vascular injuries (avulsion of the hilar vessels, and those that acutely require more than 3 units of blood, are the only absolute indications for surgery.

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PATHOLOGY

Bladder neck invasion is an independent predictor of prostate-specific antigen recurrence

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Background: The 1997 TNM staging system for prostatic carcinoma and the 2002 revision thereof classified prostatic carcinoma with bladder neck involvement classified as pT4 disease. This classification is based on the belief that tumors that invade surrounding structures are more aggressive and warrant higher staging than tumors that do not invade surrounding structures. Recent reports in the literature suggested that microscopic involvement of the bladder neck does not carry independent prognostic significance. Therefore, resection specimens with bladder neck involvement should not be classified as pT4. The current study prospectively examined the prognostic significance of bladder neck involvement by prostatic carcinoma.

Methods: The authors analyzed the totally embedded and whole-mounted radical prostatectomy specimens from 364 consecutive patients. The mean patient age was 66 years (range, 41-77 years). The bladder neck, which had been coned from the specimen, was cut in a perpendicular fashion. Involvement of the bladder neck was defined as the presence of neoplastic cells within the smooth muscle bundles of the coned bladder neck. The data were prospectively collected. Bladder neck involvement was analyzed in relation to age, preoperative prostate-specific antigen (PSA) level, prostate weight, Gleason score, final pathologic classification, tumor volume, surgical margin status, the presence of high-grade prostatic intraepithelial neoplasia, multifocality, seminal vesicle invasion, extraprostatic extension, perineural invasion, and PSA recurrence.

Results: Bladder neck involvement was found in 22 (6%) of 364 patients. Univariate results indicated that bladder neck involvement versus no bladder neck involvement was significantly associated with preoperative PSA ($P < 0.001$), higher pathologic classification ($P < 0.001$), larger tumor volume ($P < 0.001$), extraprostatic extension ($P < 0.001$), positive surgical margins ($P < 0.001$), and PSA recurrence ($P = 0.003$). In a multivariate logistic regression model controlling for pathologic classification, Gleason score, and surgical margin status, bladder neck involvement was an independent predictor of PSA recurrence ($P = 0.04$). The adjusted odds ratio for bladder neck involvement was 3.3 (95% confidence interval, 1.04-10.03).

Conclusions: In the current study, bladder neck involvement was an independent predictor of early PSA recurrence. The data demonstrated the importance of continued assessment of bladder neck invasion and supported the placement of tumors with bladder neck involvement in a stage that recognizes the prognostic implications of such involvement.

Editorial Comment

Recent studies have questioned the high risk for disease recurrence in cases of bladder neck involvement by the prostate cancer (pT4 disease) (1-4). The risk of recurrence conferred with bladder neck invasion appears not to be different from that with extraprostatic extension (pT3a) or seminal vesical invasion (pT3b).

In a recent study based on patients submitted to radical prostatectomy at our institution (4), we found that bladder neck involvement correlates with pathologic unfavorable findings on radical prostatectomy specimens as well as to preoperative PSA levels. However, the PSA-recurrence risk associated with bladder neck involvement (pT4) was similar to extraprostatic extension (pT3a) and substantially lower than seminal vesicle invasion (pT3b). Our findings favor a need for downstaging of bladder neck involvement in the next version of the TNM staging system.

The findings of Poulos et al. contradict our study and of other authors (1-4). The subject is controversial and demands further scrutiny. We believe that macroscopic or microscopic involvement of the bladder neck has different biologic implications. The original TNM classification considered as T4 the macroscopic involvement of the bladder neck. Today only microscopic involvement is seen on radical prostatectomies.

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Prostate needle biopsies: multiple variables are predictive of final tumor volume in radical prostatectomy specimens

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Background: Tumor volume is one of the most powerful predictors of patient outcome in prostatic adenocarcinoma. It is uncertain as to which preoperative variables are most predictive of final tumor volume at radical prostatectomy, especially among patients who have had positive biopsies at multiple biopsy sites. The current study attempted to identify the biopsy variables that are most predictive of final tumor volume.

Methods: The authors examined prostate biopsy specimens from 151 consecutive patients with at least 2 positive biopsy sites. The following data were collected: highest percentage of adenocarcinoma at any biopsy site, percentage of adenocarcinoma at the biopsy site with the highest Gleason score, highest percentage of cores positive for adenocarcinoma at any biopsy site, percentage of positive cores with carcinoma at the site with the highest Gleason score, number of positive sites, tumor bilaterality, and percentage of biopsy sites positive for disease. All patients underwent radical prostatectomy. The prostatectomy specimens were entirely embedded and whole mounted. Tumor volume was measured using the grid method. Logarithmic transformation was applied to tumor volumes for the purposes of the analysis.

Results: Highest percentage of adenocarcinoma at any biopsy site ($P = 0.012$), percentage of adenocarcinoma at the biopsy site with the highest Gleason score ($P = 0.021$), number of positive biopsy sites ($P = 0.026$), tumor bilaterality ($P = 0.008$), and percentage of biopsy sites positive for disease ($P = 0.0001$) all were significant predictors of tumor volume on linear regression analysis. Highest percentage of cores positive for adenocarcinoma ($P = 0.081$) and percentage of positive cores with carcinoma at the site with the highest Gleason score ($P = 0.240$) were not significant predictors of tumor volume. Based on the model F statistic, percentage of biopsy sites positive for tumor, tumor bilaterality, and highest percentage of adenocarcinoma at any biopsy site were the variables that were most predictive of tumor volume.

Conclusions: Highest percentage of adenocarcinoma at any biopsy site, percentage of adenocarcinoma at the biopsy site with the highest Gleason score, number of positive biopsy sites, tumor bilaterality, and percentage of biopsy sites positive for disease all are useful preoperative predictors of tumor volume in radical

prostatectomy specimens. Although these preoperative biopsy parameters were significant in linear regression models, none was sufficient as a single predictor of tumor volume.

Editorial Comment

The study by Poulos et al. showed that multiple pathologic findings seen in needle biopsies are predictive of final volume in radical prostatectomy specimens. The authors used the grid method for measuring tumor volume. Some institutions have calculated the tumor volume accurately, using computer-assisted image analysis systems. Because this method is not feasible for the routine clinical practice, other investigators have proposed alternative simpler means. The grid method is one of these alternative simpler means that measures tumor extent.

A number of studies have documented that the tumor extent, the volume or the percentage of prostatic tissue involved by the tumor within the prostate gland may be important prognostic indicators. However, the subject is controversial. Although most authors agree that tumor extension (percentage of carcinoma or tumor volume) in patients with prostate carcinoma should be reported in radical prostatectomies because of its prognostic importance, in some analyses, tumor size has not been considered to be an independent predictor of tumor recurrence (1,2).

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INVESTIGATIVE UROLOGY

Intracavernosal injection of vascular endothelial growth factor improves erectile function in aged rats

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Objectives: To investigate whether intracavernosal injection of vascular endothelial growth factor (VEGF) can restore erectile function in the aging rat.

Materials and Methods: Ten young (4-5 months) and 30 old (24 months) Sprague-Dawley male rats were used. The old rats were divided into 3 groups: vehicle-only (phosphate buffered saline plus 0.1% bovine serum albumin; n = 10), VEGF 1 microg/kg (n = 10), and VEGF 10 microg/kg (n = 10). At 2 and 4 weeks after