Primary Endoscopic Realignment of Urethral Disruption Injuries—A Double-Edged Sword?

Niels V. Johnsen,* Roger R. Dmochowski, Stephen Mock, W. Stuart Reynolds, Douglas F. Milam and Melissa R. Kaufman

From the Department of Urologic Surgery, Vanderbilt University Medical Center, Nashville, Tennessee

Abbreviations and Acronyms

AAST = American Association of Surgery for Trauma

CIC = clean intermittent catheterization

DVIU = direct vision internal urethrotomy

ED = erectile dysfunction

PER = primary endoscopic realignment

SPT = suprapubic tube

UI = urinary incontinence

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Study received institutional review board approval.

* Correspondence: Department of Urologic Surgery, A-1302 Medical Center North, Vanderbilt University Medical Center, Nashville, Tennessee 37232 (telephone: 504-250-6694; FAX: 615-322-8990; e-mail: niels.v.johnsen@vanderbilt.edu).

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Purpose: Controversy remains regarding initial management of traumatic urethral disruption injuries. We evaluated the outcomes of primary endoscopic realignment vs suprapubic tube placement in this patient population.

Materials and Methods: We reviewed our urological trauma database for patients with blunt trauma related posterior urethral injuries from 2000 to 2014. Patients underwent primary endoscopic realignment or suprapubic tube placement alone. The primary outcome was the success of primary realignment, defined as no further need for urological intervention. Secondary outcomes were the need for endoscopic interventions and/or urethroplasty, time to urethroplasty, urethroplasty success and long-term functional outcomes.

Results: A total of 27 patients underwent primary realignment and 14 underwent suprapubic tube placement. Mean followup was 40 months (median 24, range 1 to 152). Realignment was successful in 10 patients (37%) at a mean followup of 67.3 weeks (median 27.3, range 4 to 284). In the 17 cases (63%) that failed mean time to failure was 9.7 weeks (median 8.5, range 1 to 26). Seven patients (26%) treated with realignment and 11 (79%) with a suprapubic tube proceeded to urethroplasty. Mean ± SD time to urethroplasty was significantly shorter in the suprapubic tube group (14.6 ± 7.6 vs 5.8 ± 1.6 months, $p = 0.003$). There was no difference in operative time, complications, success or functional outcomes.

Conclusions: Management of traumatic urethral disruption injuries by primary endoscopic realignment serves as definitive therapy in more than a third of treated patients. It prevents the need for formal urethroplasty in more than half of failed cases.

Key Words: urethra; urinary bladder; wounds, nonpenetrating; urethral stricture; endoscopy

Traumatic urethral disruption injuries in men are a rare consequence of pelvic trauma with a recent series reporting an incidence of less than 2%.[1] The recently published AUA (American Urological Association) guideline recommendation that clinicians may perform PER as initial management is based on grade C evidence and, thus, it highlights the limited data available to guide treatment strategies.[2] The aim of PER is to achieve earlier return of unobstructed voiding and obviate the need for future urethroplasty. Numerous studies show that patients treated with PER have lower rates of urethral stricture disease and less severe

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strictures when they develop.[3–7] However, a recent analysis suggested that patients treated with PER experience a prolonged clinical course with a delayed return to unobstructed voiding compared to those who undergo primary SPT alone.[8] As such there is concern that some practitioners may improperly view PER as definitive therapy and this misconception may delay appropriate referral to specialists.[9]

We evaluated our single institution experience with the management of urethral disruption injuries, directly comparing the clinical course of patients treated with PER to those who received a SPT alone. The primary aim was to determine the rate of successful PER (defined as no further interventions after catheter removal), hypothesizing that a significant proportion of patients treated with PER avoid future major urethral reconstructive surgery. Secondary aims included evaluation of time to urethroplasty as well as procedural complications and outcomes between patients treated with PER and SPT.

METHODS

After obtaining institutional review board approval we reviewed our prospectively maintained database of all trauma admissions to our medical center between January 2000 and June 2014. Patients were identified who had evidence of traumatic injury to the bladder or urethra as indicated by ICD-9 code 867.0 or 867.1. To capture patients referred to our tertiary care center after initial treatment elsewhere we reviewed the records of all patients seen in the Department of Urologic Surgery outpatient clinic for traumatic pelvic fracture (808.0-808.9), traumatic injury to the bladder or urethra (867.0-867.1) and/or traumatic urethral stricture (598.1) during the same period. Only patients with injuries from blunt trauma were included in analysis and all patients with concomitant bladder or ureteral injury were excluded.

Electronic medical records were reviewed to identify those with traumatic urethral disruption injuries who underwent PER or SPT placement in the acute trauma setting. Information was obtained on demographics, mechanism of injury, primary management and outcomes. The degree of urethral injury was determined by radiographic and operative findings, and graded based on the AAST classification.[10] The primary end point was PER success. Secondary end points included the need for urethroplasty, time to urethroplasty, procedural complications and success, and development of postoperative ED or UI. Patients who were lost to followup were excluded from final analysis.

Patients were placed in one of 2 groups based on an initial management strategy of PER or SPT placement. It is the general practice at our institution to attempt early PER in all hemodynamically stable patients with urethral disruption injuries. PER was done in similar fashion in all included cases. Flexible cystoscopy was performed through a suprapubic tract when applicable, with simultaneous retrograde flexible cystoscopy via the urethra. A guidewire was passed to achieve urethral continuity and a Foley catheter was placed over the wire. No open urethral realignments were performed during the study period. Urethral catheters were left in place until a pericatheter retrograde urethrogram showed no evidence of contrast extravasation.

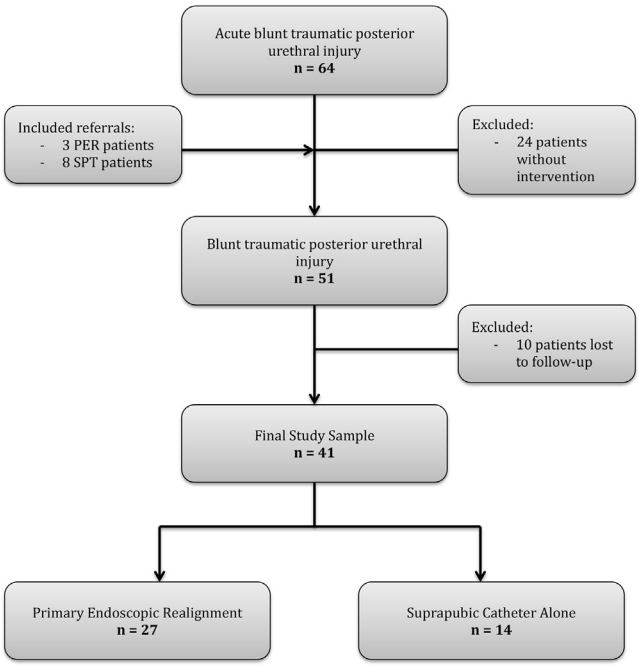
The restrospective nature of this study precluded a standardized followup schedule. However, all patients underwent subsequent uroflowmetry, post-void residual urine measurement, cystoscopy and/or symptom questionnaires following catheter removal. For those who later required urethroplasty the time to intervention, duration of procedure, need for rerouting procedures, complications and outcomes were assessed.

Failure of PER was defined as development of a symptomatic stricture requiring intervention. ED and UI were determined based on subjective patient evaluation at followup.

Statistical analysis was performed using Stata/IC™, version v13.1. Categorical variables were compared using the Fisher exact test and continuous variables were compared using the Student t-test. All statistical tests were 2-sided with $p < 0.05$ considered statistically significant.

RESULTS

A total of 64 patients were identified from January 2000 to June 2014 with blunt traumatic urethral injuries, of whom 40 had injuries requiring acute intervention (see figure). The remaining 24 patients were excluded from study since they had minimal stretch injuries and were treated with retrograde



Final study patient population