

# Lower Urinary Tract Pain and Anterior Urethral Stricture Disease: Prevalence and Effects of Urethral Reconstruction

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## Abbreviations and Acronyms

CLSS = Core Lower Urinary Tract Symptoms Score

I-PSS = International Prostate Symptom Score

LUTP = lower urinary tract pain

MSHQ = Male Sexual Health Questionnaire

PROM = patient reported outcomes measure

QOL = quality of life

SHIM = Sexual Health Inventory for Men

USD = urethral stricture disease

**Purpose:** Anterior urethral stricture disease most commonly presents as urinary obstruction. Lower urinary tract pain is not commonly reported as a presenting symptom. We prospectively characterized lower urinary tract pain in association with urethral stricture disease and assessed the effects of urethroplasty on this pain.

**Materials and Methods:** Men (18 years old or older) with anterior urethral stricture disease were prospectively enrolled in a longitudinal, multi-institutional, urethral reconstruction outcomes study from June 2010 to January 2013 as part of TURNS (Trauma and Urologic Reconstruction Network of Surgeons). Preoperative and postoperative lower urinary tract pain was assessed by the validated CLSS. Voiding and sexual function was assessed using validated patient-reported measures, including I-PSS.

**Results:** Preoperatively 118 of 167 men (71%) reported urethral pain and 68 (41%) reported bladder pain. Age was the only predictor of urethral pain with men 40 years or younger reporting more pain than those 60 years old or older (81% vs 58%,  $p = 0.0104$ ). Lower urinary tract pain was associated with worse quality of life and overall voiding symptoms on CLSS and I-PSS (each  $p < 0.01$ ). Postoperatively lower urinary tract pain completely resolved in 64% of men with urethral pain and in 73.5% with bladder pain. There were no predictive factors for changes in lower urinary tract pain after urethral reconstruction.

**Conclusions:** Lower urinary tract pain is common in urethral stricture disease, especially in younger men. It is associated with worse quality of life and voiding function. In most men lower urinary tract pain resolves after urethral reconstruction.

**Key Words:** urethral stricture, lower urinary tract symptoms, pain, quality of life, reconstructive surgical procedures

ANTERIOR USD in men most commonly presents as complaints of a slow or weak urine stream, recurrent urinary tract infections, difficult catheterization and/or acute urinary retention.<sup>1,2</sup> Pain is described less often as a

presenting symptom in USD, although retrospective reports in USD populations mention dysuria rates up to 10%<sup>3</sup> and genitourinary pain rates up to 22.9%.<sup>4</sup> Because conditions that lead to pain are

Accepted for publication July 7, 2014.  
Study received institutional review board approval.

Supported by an unrestricted grant from the Joe W. and Dorothy Dorsett Brown Foundation.

\* Financial interest and/or other relationship with American Medical Systems, GT Urological, Percusion and Auxilium.

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associated with higher patient bother,<sup>5</sup> health care seeking behavior and health costs,<sup>6</sup> a study specifically addressing the association of LUTP and USD is warranted. Additionally, with PROMs becoming an increasingly important tool to monitor surgical outcomes the response of LUTP to USD treatment is of particular interest to reconstructive urologists.

The purpose of our study was to 1) describe the prevalence of LUTP in men with anterior USD, 2) determine patient and stricture characteristics associated with LUTP, 3) assess the effect of urethral reconstruction on LUTP in the postoperative period and 4) determine patient and surgical characteristics that predict changes in LUTP after urethroplasty. We hypothesized that 1) using validated questionnaires that assess LUTP with lower urinary tract symptoms we would find LUTP rates in patients with USD that were higher than previously reported in retrospective series, 2) preoperative LUTP rates would differ by stricture location and length, and baseline patient demographics, and 3) successful urethroplasty in patients with complaints of preoperative LUTP would improve their pain.

## METHODS

### Study Subjects

Between June 2010 and January 2013 men 18 years old or older undergoing anterior urethral reconstruction for USD at a total of 8 institutions participating in TURNS (Trauma and Urologic Reconstruction Network of Surgeons) were offered enrollment in a prospective, longitudinal, institutional review board approved, observational database to study outcomes of anterior urethroplasty. Subjects were excluded from study if they had underlying neurogenic bladder, a suprapubic tube at the time of initial assessment (preventing the ability to assess preoperative voiding pain) or PROM surveys were not obtained preoperatively and postoperatively. For all enrolled subjects a multitude of subjective and objective data, including uroflowmetry, were obtained preoperatively and postoperatively, generally at 3 and 12 months, and yearly thereafter, according to the TURNS specific protocol.<sup>7</sup> This information along with demographic and clinical data obtained during clinical and operative visits was prospectively recorded in a web based, institutional review board approved database. Stricture characteristics were assessed preoperatively and intraoperatively. However, in the current analysis only intraoperative characteristics such as stricture length were included.

### LUTP Analysis

To meet the objectives discussed we first analyzed the responses provided by study participants on the CLSS questionnaire<sup>8</sup> preoperatively and at all postoperative visits. CLSS is a 10-item questionnaire validated to assess a range of lower urinary tract symptoms for a wide range of obstructive and nonobstructive urological diseases.

CLSS questions 9 and 10 ask patients to rate the frequency of bladder and urethral/penile pain, respectively, on a Likert scale of 0—never, 1—rarely, 2—sometimes and 3—often. The CLSS QOL question is “If you were to spend the rest of your life with your urinary symptoms just the way it is now, how would you feel about that?” The CLSS PROM does not assess pain severity or the timing of pain in relation to urination.

We also used cumulative data from other questionnaires administered preoperatively and at all postoperative visits to assess the relationship between LUTP and other urological specific conditions. Voiding symptoms and urinary specific QOL were assessed by I-PSS. The total score possible was 35 with 1 to 7 points indicating mild, 8 to 19 indicating moderate and 20 to 35 indicating severe symptoms. The QOL question, “If you had to spend the rest of your life with your symptoms just as they are now, how would you feel about that?” is rated on a scale of 0—delighted to 6—terrible. Ejaculatory function was evaluated using the 4 questions in MSHQ specific to ejaculation. MSHQ includes a total of 25 questions. The 4 questions relating to ejaculation are scored on a range of 5—good to 0—bad. Erectile function was evaluated by SHIM. The total possible score is 25 with 1 to 7 indicating severe, 8 to 11 indicating ED, 12 to 16 indicating mild to moderate and 17 to 21 indicating mild erectile dysfunction.

All subjective and objective data were obtained preoperatively and at each followup appointment. For subjects on whom more than 1 postoperative followup information was available the most recent data were used for analysis.

### Statistical Analysis

We first described the presence of urethral/penile and bladder pain in patients with urethral stricture preoperatively using simple statistics. The chi-square test was used to evaluate the association between preoperative patient variables and pain. We then determined how LUTP responded to urethral reconstruction by determining patient specific postoperative changes in pain scores using simple statistics. Changes in pain scores from preoperatively to postoperatively were compared to patient and surgical predictor variables using chi-square analysis for categorical variables and the t-test for continuous variables. In patients who completed more than 1 postoperative CLSS questionnaire we used data only from the most recent questionnaire. Finally, multivariate analysis was done by creating logistic regression models using a stepwise process to predict for preoperative pain and changes in pain postoperatively. All statistical analysis was done with SAS® 9.3 with  $p < 0.05$  considered significant.

## RESULTS

### Demographics and Clinical Factors

Five surgeons provided CLSS questionnaires to their patients at preoperative and postoperative visits between June 2010 and January 2013, resulting in 167 men being included in the current analysis. A total of 97 men who underwent urethroplasty during

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