

Urethroplasty Improves Overactive Bladder Symptoms in Men With Anterior Urethral Strictures



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OBJECTIVE	To assess the effect of urethroplasty on overactive bladder (OAB) symptoms.
MATERIALS AND METHODS	From March 2011 to November 2014, 47 anterior urethroplasties were performed by a single surgeon (RSP). Of these, 42 men prospectively completed the validated Overactive Bladder Symptom Score (OABSS) prior to and after urethroplasty. Comparative analysis of preoperative to postoperative OABSS results was performed.
RESULTS	The median (range) age of men who comprised our cohort was 49 (22-90). Questionnaires were completed preoperatively and at a median of 12 months (2.3-74.6) postoperatively. Stricture location included the following: bulbar (75%), penile (15%), and membranous (7.5%) urethra. Median stricture length was 3 cm (1-6). Half of the men underwent an excision and anastomotic repair, and half underwent buccal mucosal graft. Men experienced significant improvement in urinary flow rate, postvoid residual urine, and OAB symptoms reported on the OABSS. Of the 28/42 men with preoperative, clinically significant OAB (ie, OABSS \geq 8), 25/28 reported a 54.2% (0%-100%) median reduction in OABSS, with only 1 patient reporting worsening of symptoms following surgery. Those men with the highest preoperative OABSS experienced the greatest improvement in OAB symptoms postoperatively.
CONCLUSION	In men with anterior urethral strictures and OAB, urethroplasty decreased reported OABSS by $>$ 50% and cured 90% of men with clinically significant OAB symptoms. UROLOGY 93: 208–212, 2016. © 2016 Elsevier Inc.

Veterans Administration and Medicare claims data suggest that 0.2% to 0.9% of men suffer from urethral strictures,^{1,2} with up to 42% of those developing a urinary infection and 11% incontinence in any given year.³ Common presenting symptoms of strictures include obstructive lower urinary tract symptoms and urinary retention,⁴ and urethroplasty offers an effective, durable treatment.⁵ Urethral strictures may also lead to overactive bladder (OAB) symptoms. This overlap between urinary obstruction precipitating irritative voiding symptoms has been well documented.⁶ In fact, over half of men with urethral stricture disease will complain of urgency and frequency.^{6,7}

Urinary urgency is the essential feature of OAB, which the International Continence Society defines as “urgency with or without urge incontinence, usually with frequency

and nocturia.”⁵ Because there has not been a validated instrument to define OAB until recently, there have not been adequate studies evaluating whether patients with strictures and OAB symptoms have resolution of their OAB after urethroplasty. We evaluated the effect of urethroplasty on urgency and OAB using a validated instrument—the Overactive Bladder Symptom Score (OABSS) questionnaire. This tool quantitates all aspects of OAB and utilizes a graded response for urgency symptoms.⁶ The OABSS is the only validated and reliable OAB questionnaire with a validated, hard cutoff score of \geq 8 for clinically significant for OAB. Our primary aim was to evaluate changes in OAB symptoms, utilizing the OABSS following anterior and membranous urethroplasty. We hypothesized that in men with OAB and urethral strictures, anterior urethroplasty cures overactive and urgency symptoms.

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MATERIALS AND METHODS

From March 2011 to November 2014, 47 anterior urethroplasties were performed by a single surgeon (RSP). Of these, 42 men prospectively completed both a preoperative and postoperative OABSS and comprised our cohort for analysis. The diagnosis of urethral stricture was based on clinical symptoms, flow rates, and/

or postvoid residual (PVR), and confirmed by cystoscopy and retrograde urethrogram (RUG). The etiology, location, and length of anterior stricture were recorded. Preoperative patient assessment was made with history, physical examination, urinary flow rate (Q), postvoid residual, cystoscopy, and/or voiding cystourethrogram.

All men underwent anterior or membranous urethral reconstruction. Men who reported a prior history of pelvic radiation, posterior urethral distraction defects, prior pelvic fractures, or with multiple, discrete synchronous strictures on retrograde urethrogram were excluded from this study. Patients who did not complete a preoperative or postoperative questionnaire were also excluded from analysis. Men who underwent alternative treatments for anterior stricture disease such as surveillance, meatotomy, urethrotomy, or urethral dilation were also excluded from this analysis.

The OABSS is a validated and reliable OAB questionnaire consisting of 7 self-administered questions on a 5-point Likert scale. Five questions are related to urinary urgency and 2 are related to nighttime frequency, with the total score ranging from 0 to 28. A hard, cutoff score of ≥ 8 has been validated for the diagnosis of clinically significant OAB.⁶ A score of 7 or less was not consistent with OAB. The OABSS questionnaire was completed during patients' initial visit and postoperatively following urethroplasty. Stricture recurrence or failure was defined by the inability to pass a 15 French cystoscope past the area(s) of urethral reconstruction. Comparisons between all preoperative and postoperative assessments including OABSS was performed with a Wilcoxon rank-sum test. Statistical significance was defined by *P* value less than .05. All statistical analysis was carried out with SPSS v. 20 (IBM, Armonk, NY).

Table 1. Baseline characteristics and demographics

	Median N (Range) or (%)
Total	42
Age	49 (22-90)
Follow-up in months	46.2 (2.3-82.8)
Intraoperative stricture length (cm)	3 (1-6)
Etiology*	
Idiopathic	11 (32.4%)
Iatrogenic	17 (50%)
Trauma	4 (11.8%)
Location*	
Bulbar	30 (75%)
Membranous	3 (7.5%)
Penile	6 (15%)
Repair type	
EPA	21 (50%)
Buccal graft	21 (50%)

EPA, excision and primary anastomosis.

* Not all data available.

RESULTS

Preoperative and postoperative OABSS were completed by 42 men who underwent anterior urethroplasty by excision and primary anastomosis (EPA) or substitution buccal mucosal graft.

Table 1 demonstrates the baseline characteristics of the cohort. The most common etiology of stricture disease was iatrogenic (50%) followed by idiopathic (32.4%). The median intraoperatively measured urethral stricture length repaired was 3 cm (range 1-6), and the most common location was the bulbar urethra (75%) for which the equal number of men underwent EPA repair or buccal mucosal graft urethroplasty. Buccal grafts were used both ventrally and dorsally as both onlays or with an augmented anastomosis. Of the 42 men included for analysis, 28 men reported clinically significant preoperative OAB symptoms as defined by a score ≥ 8 on the OABSS.

Postoperatively, patients were followed for a median of 44.8 months (range 2.3-82.8). Postoperative OABSS questionnaires were completed at a median of 12.25 months (range 2.3-31.2) to ensure stabilization and/or normalization of symptoms. Median changes in PVR, maximal Q, and OABSS data for our cohort are summarized in Table 2. During the follow-up period, no patient required treatment for recurrence of stricture.

The median percentage decrease in total OABSS following surgical intervention of men with clinically significant OAB was 54.2% (0%-100%), with greater improvement seen in men with higher preoperative OABSS. Of the 28 men with clinically significant OAB, 90% reported an improvement in OAB symptoms. Two patients (7.1%) were unchanged and one (3.6%) reported worsening symptoms. In this patient, a urethroscopy was performed without evidence of recurrent stricture. No patients required further OAB treatment postoperatively with medication. Following urethroplasty, 25 men reported an OABSS < 8 , defined as cure from symptoms (Fig. 1). On subanalysis, men who reported an OABSS between 12 and 15 or greater than 15 were found to have significant improvements in their postoperative OABSS (Fig. 2).

DISCUSSION

Bladder outlet obstruction (BOO) from prostatic obstruction has long been recognized to cause both obstructive voiding symptoms and irritative storage symptoms.⁸ BOO from urethral strictures may cause a variety of lower urinary tract symptoms including slow stream, hesitancy, double voiding, intermittency, urgency, urge incontinence

Table 2. Preoperative to postoperative changes in men following anterior urethroplasty

	Preoperative (Range)	Postoperative (Range)	Median Change	<i>P</i> Value*
Qmax (mL/s)	5 (1-26)	24 (3-135)	+73.1%	<.01
Post-void Residual (cc)	82 (0-1000)	27 (0-394)	-53.6%	<.01
Median OABSS	13 (6-22)	5 (1-22)	-54.2%	<.01

OABSS, Overactive Bladder Symptom Score; Qmax, maximal urinary flow rate.

* Wilcoxon rank-sum test.

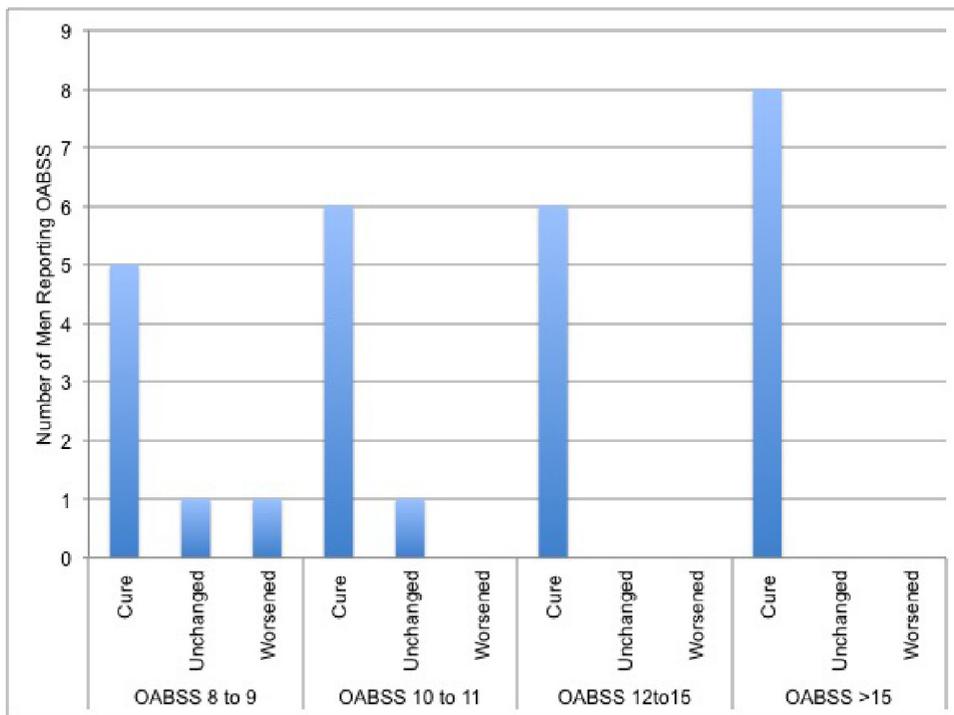


Figure 1. Outcomes of OABSS in men with clinically significant OAB⁺ following anterior urethroplasty. +Defined by OABSS \geq 8. OABSS, Overactive Bladder Symptom Score.

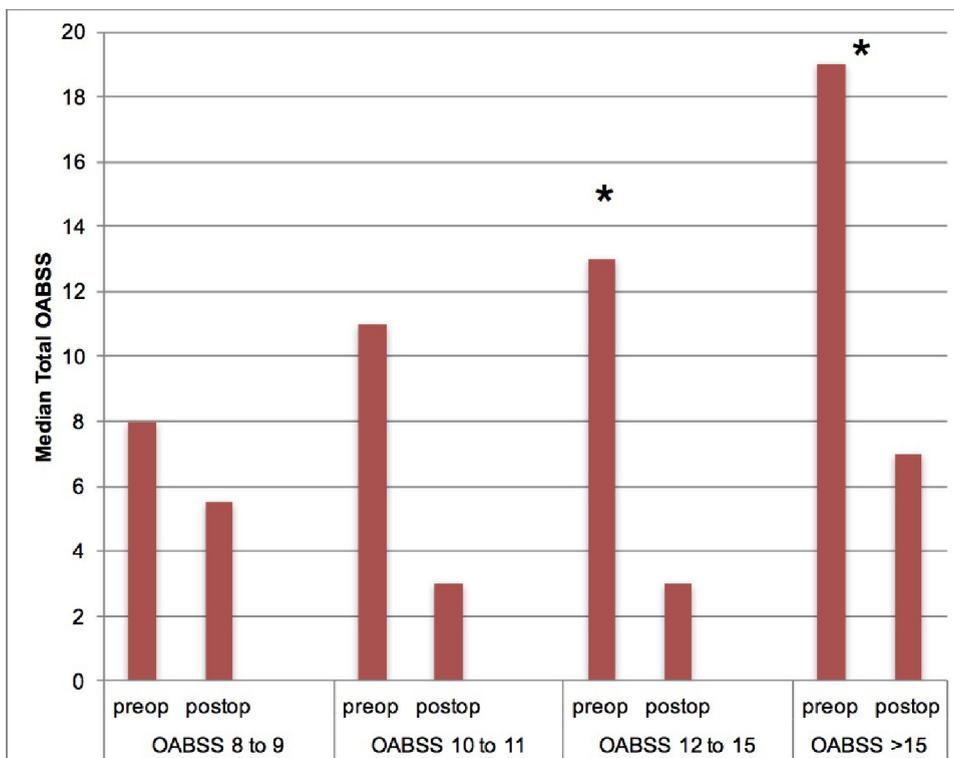


Figure 2. Preoperative to postoperative changes in OABSS in men with clinically significant OAB⁺ following anterior urethroplasty. **P* value < .01; +Defined by OABSS \geq 8. OABSS, Overactive Bladder Symptom Score.

frequency, and nocturia.⁷ Although the exact pathophysiology is complex and not fully understood, BOO from urethral stricture disease causes detrusor overactivity and OAB symptoms.⁹

Comparing our data to published literature on BOO from prostatic origin,⁸ we propose that relief of BOO by urethroplasty in men with strictures improves OAB symptoms. Our data also suggest that in male patients who present with OAB symptoms, clinicians should consider urethral stricture disease as part of their differential diagnosis prior to empiric treatment with antimuscarinics.

Measuring surgical success with symptomatic improvement following urethroplasty remains problematic due to difficulty correlating stricture severity with symptoms and their improvement following intervention.¹⁰ Questionnaires targeting urethroplasty success are sparse. Most reports utilize surrogate questionnaires targeting lower urinary tract symptoms or sexual function to evaluate improvement.¹¹ Furthermore, there is no consensus on instrument usage, frequency, or follow-up duration. Improvement in the American Urological Association symptom score (AUASS) following urethroplasty has been well documented.¹² Although the AUASS has long been used to assess obstructive and irritative voiding symptoms, the questionnaire does not capture the full scope of voiding complaints associated with urethral strictures. Furthermore, there is a lack of specificity using the AUASS to reevaluate urethral stricture recurrence. Nuss et al reported that roughly 20% of men had silent stricture disease as assessed by normal AUASS indices, suggesting that a validated, disease-specific questionnaire is warranted.⁷

The OABSS captures urinary urgency and daytime and/or nighttime urinary frequency in a 7-part, self-administered questionnaire. The questionnaire has been well correlated with health-related quality of life scores and captures response to therapeutic interventions.¹³ Blaivas et al found high levels of internal consistency, reliability, and correlation in men and women who completed the questionnaire on separate occasions in which there was stability in symptoms.⁶ This questionnaire has not previously been used to evaluate stricture disease and remains a promising addition to clinical and academic evaluation of anterior urethral strictures. Although we did not evaluate the use of the OABSS for evaluation of stricture recurrence in men who presented with OAB, this may be an area of fruitful study in the future.

This study demonstrates that urethroplasty is effective in relieving OAB symptoms in men with anterior urethral strictures. It also recognizes the high rate of OAB in men with anterior strictures, with over 65% of our cohort reporting clinically significant OAB symptoms. Following urethroplasty, there was over a 50% reduction in OAB symptoms. Only 1 patient reported significant worsening of symptoms following surgery (6 months postoperatively) and did not have evidence of recurrent stricture on urethroscopy. For a disease that causes a significant burden to our healthcare system, surgical intervention provides a safe alternative for men with clinically significant OAB

beyond pharmacologic treatments, which are fraught with deleterious side effects and have poor patient compliance.¹⁴ In our cohort, all patients with an OABSS ≥ 12 were cured of OAB symptoms.

Our study has several limitations. Patients were prospectively followed; however, the dataset was retrospectively analyzed. Men completed the postoperative OABSS assessment at differing time points. Furthermore, the durability of OABSS improvement is not known, given the limited follow-up of our cohort. Repeat OABSS assessment was not performed. The impact of urethrotomy or urethral dilation vs urethroplasty on OABSS is unknown; therefore, the superiority of a single intervention with urethroplasty is poorly defined. Lastly, surgical complication data were not collected, which may bias self-reported OABSS.

Future studies should compare treatment with antimuscarinics vs upfront urethroplasty for men with significant OAB symptoms and concomitant strictures to demonstrate if superiority of surgery over medication alone exists.

CONCLUSION

Urethroplasty via EPA or buccal mucosal graft for men with nonirradiated, short, anterior urethral stricture disease significantly improves or cures OAB symptoms in most patients. In addition to improvement of Q and PVRs, men with preoperative OAB and an anterior urethral stricture can expect some improvement in OAB symptoms following surgical intervention.

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APPENDIX

SUPPLEMENTARY DATA

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.urology.2016.04.003>.