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Evaluation of Functional, Objective and Sexual Outcomes and Patient Reported Quality of Life After Anterior Urethral Reconstruction

Sabby Dias, Vijay Patidar, Rohit Namdev, Sandeep Kumar, Shivanand Prakash, Hari Shankar, Sameer Trivedi

Department of Urology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India

What's known on the subject? and What does the study add?

Traditionally used parameters to define the success of urethral reconstruction have been under scrutiny in several recently published studies which have the importance of subjective assessment using patient reported quality of life measures and evaluation of sexual function following urethral reconstruction. However, there is still sparse data regarding the role of subjective and sexual function assessment in evaluating outcomes of urethral reconstruction. This study evaluates and underscores the role of patient reported outcome measures as a complement to the established objective parameters and highlights the importance of assessing sexual function in patients undergoing urethral reconstruction.

Abstract

Objective: To assess patient satisfaction and quality of life after urethroplasty using clinician driven and patient reported outcome measures.

Materials and Methods: We prospectively evaluated fifty-one men with anterior urethral stricture who underwent urethroplasty. Patient demographics, maximum flow rate and post-void residual urine, International Prostate Symptom Score (IPSS), urethral stricture surgery patient-reported outcome measure (USS-PROM), five-item International Index of Erectile Function (IIEF-5), Male Sexual Health Questionnaire Short Form (MSHQ EjD SF), were collected before surgery and compared with outcomes 1 year after surgery.

Results: Fifty-one men with anterior urethral stricture underwent 18 (35.3%) anastomotic urethroplasties and 33 (64.7%) augmentation urethroplasties. Of 47 men who were available at follow-up, Qmax improved from preoperative mean of 4.4 to 18.3 [-13.86; 95% confidence interval (CI) (-15.1) - (-12.6); p<0.001], post-void residual urine volume (PVR) from 115.1 to 22.1 (93.0; 95% CI 75.2 - 111; p<0.001), IPSS from 20.93 to 3.55 (17.3; 95% CI 16.1 - 18.6; p<0.001). 38 (80.9%) patients were "very satisfied", 3 (6.4%) patients were "satisfied", 5 (10.6%) patients were "unsatisfied" and 1 (2.1%) patient was "very unsatisfied" with the surgery as per USS-PROM. IIEF-5 was insignificantly improved from preoperative mean of 20.72 to 20.89 [-0.17; 95% CI (-0.6) - 0.3; p=0.47] and MSHQ-EjD SF was significantly improved from 10.2 to 11.2 [-0.1; 95% CI (-1.2) - (-0.7); p<0.001].

Conclusion: Patient-reported outcome measurements play an important role in evaluating the outcome of urethroplasty in men with urethral stricture disease and should be used concomitantly with objective measurements of Qmax and PVR. This helps in evaluating the outcomes of surgery in the form of patient satisfaction and quality of life.

Keywords: Urethroplasty, urethral stricture surgery patient-reported outcome measure, sexual function

Introduction

The urethral stricture is a high complexity disease that impacts affected men by progressive symptoms and the need for repeated surgical interventions. Outcome measures of urethroplasty, considered a gold standard for managing urethral stricture disease, are predominantly clinician driven indicators of technical success (1). These measures are not always aligned with symptomatic and health-related quality of life improvements. The definition of urethroplasty success varies widely, which makes comparisons between different studies difficult (2,3).

Correspondence: Sameer Trivedi MD, Department of Urology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India
Phone: +91 9839861656 **E-mail:** drsameertrivedi@gmail.com **ORCID-ID:** orcid.org/0000-0001-8308-9220
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The need for a subjective assessment after urethroplasty was studied in 2002 by Kessler et al. (4) In urethroplasty, patient-reported outcome measure (PROM) is an upcoming tool to score the outcome of urethroplasty based on patient-centered, subjective information complementary to the objective information provided by uroflowmetry, urethrography and urethroscopy.

Jackson et al. (5) in 2011 designed and validated the first PROM to assess condition-specific quality of life as well as health-related quality of life for patients undergoing urethral stricture surgery (USS-PROM). It is a composite instrument comprising lower urinary tract symptoms (LUTS) domain, a generic health status domain, and a treatment satisfaction question. Various validated translations of USS-PROM have been reported and implemented in routine clinical practice (6,7).

Persisting *de novo* erectile dysfunction (ED) has been described in 1% of the patients after urethroplasty (8). An abridged five-item version of the 15-item International Index of Erectile Function was developed (IIEF-5) to diagnose the presence and severity of ED (9).

The Male Sexual Health Questionnaire (MSHQ) was developed in 2004 to assesses sexual function and satisfaction in older men with urogenital symptoms of LUTS and sexual dysfunction (10). The abridged version, MSHQ-EjD Short Form, was developed and validated for assessing ejaculatory dysfunction in 2007 (11). Ejaculatory function is often better after urethroplasty than before, provided the continuity of the bulbospongiosus muscle is actively restored during the multilayered closure of the perineum (12,13).

Very few studies have included International Prostate Symptom Score (IPSS), USS-PROM (including Health-related quality of life domains, and a treatment satisfaction question), IIEF-5 and MSHQ-EjD SF in combination to assess the outcomes of urethral reconstruction in a single study. This study aimed to evaluate patient-reported outcomes to better describe patients' perception of success, considering urinary bother scores, quality of life, erectile, ejaculatory and sexual function.

Materials and Methods

Between January 2018 and January 2019, 51 consecutive men with anterior urethral strictures who underwent urethroplasty in the Department of Urology at a tertiary level academic institute were included in the study after seeking approval from the Institute Ethical Committee and Institutional Review Board. Patients were followed up for minimum 1-year post-surgery. The Local Institutional Ethics Committee (no: 2018/EC/781, date: 31.01.2018) approved this study.

Inclusion Criteria

Men with anterior urethral strictures undergoing urethroplasty,

Age 18 to 65 years.

Exclusion Criteria

Patients who had previously undergone urethroplasty,

Patients with neurogenic bladder,

Patients with BPH.

Pre-operative Assessment

Patients' data were collected in terms of age, presenting complaints including LUTS, co-morbid conditions, and prior history of urinary tract infection, catherization, urological intervention, surgery, and trauma. Patients underwent a thorough physical examination with an assessment of meatus and glans, presence of lichen sclerosus like changes, palpation of urethra, genitalia and digital rectal examination. Pre-operative routine tests were conducted in the form of urine routine and microscopic examination, culture and sensitivity testing, hemogram, and renal function tests. Uroflowmetry was obtained from patients not on a suprapubic catheter. The maximum flow rate (Qmax) along with voided volume and flow pattern was noted. Ultrasonography was performed to assess the upper tracts, bladder wall changes and post-void residual urine volume (PVR). A combined retrograde urethrogram and voiding cystourethrography was performed to assess the stricture length and location. Cysto-urethroscopy was performed to identify the site of stricture and to assess the elasticity of the urethra along with the degree of spongiofibrosis. In selected cases, pediatric endoscopes were used to visually inspect and assess the caliber of the urethral lumen. IPSS, USS-PROM, IIEF-5 and MSHQ-EjD SF were collected preoperatively.

The USS PROM questionnaire incorporates LUTS and Health-related quality of life (HRQoL) domains, and a treatment satisfaction question. The IIEF-5 questionnaire was used to assess the presence and severity of ED. MSHQ-EjD Short Form, which consists of three ejaculatory function items and one ejaculation bother item was used for assessing ejaculatory dysfunction.

Operative Assessment

Surgical procedures performed for urethral reconstruction included anastomotic urethroplasty and augmentation urethroplasty using oral mucosal grafts. The site and length of stricture along with the degree of spongiofibrosis was noted. The site, size, number and length of grafts required for augmentation urethroplasty were noted.

Augmentation procedures included were dorsal inlay graft (Asopa), dorsal onlay graft (Barbagli), dorsolateral graft

(Kulkarni), and combined dorsal plus ventral graft urethroplasty. Dorsal inlay graft (Asopa) urethroplasty was used for cases where the urethra is densely adherent to the underlying corpora cavernosa as a consequence of repeated optical urethrotomies or urethral dilatations and strictures with relatively wider caliber (urethral lumen more than 10 Fr), while dorsal onlay graft urethroplasty (Barbagli) or dorsolateral graft (Kulkarni technique) was used for narrow strictures (urethral lumen less than 10 Fr). Combined dorsal plus ventral graft urethroplasty was used for very tight strictures (urethral lumen less than 6 Fr).

Patients underwent pericatheter urethrogram 3 weeks after the surgery, following which the trial of void was given. The suprapubic catheter was removed 1 week after a successful trial of the void.

Postoperative Follow-up Assessment

IPSS, uroflowmetry and PVR were evaluated at 3 months following urethroplasty. Uroflowmetry, PVR, IPSS, USS-PROM, IIEF-5, and MSHQ-EjD SF scores were collected at 1 year follow up and compared with preoperative scores. Patients with persisting symptoms and/or those requiring subsequent procedures were noted. Technical success was defined as patients who did not require re-intervention. Patient satisfaction according to the USS-PROM was also assessed.

Statistical Analysis

Qualitative data are represented in the form of frequency and percentage. Quantitative data were presented using mean, range & 95% Confidence Interval. Comparison between quantitative data pre- & post-surgery was done using Paired t-test. Association between qualitative variables was assessed using Chi-Square test with Continuity Correction for all 2 X 2 and Fisher's Exact test for all 2 X 2 tables where p-value of chi-square test was not valid due to small counts.

Results are graphically represented where deemed necessary. Appropriate statistical software, including MS Excel and SPSS 25, were used for statistical analysis. A graphical representation was done in MS Excel 2016.

Results

Baseline characteristics of the 51 patients included in the study are given in Table 1.

Urine cultures were positive in 7 (13.8%) patients - *E. coli* in 6 (11.8%) patients and *E. faecalis* in 1 (2%). Patients were started on antibiotic therapy according to their sensitivity.

Operative Findings

Details of the surgical procedures are provided in Table 2. Meatal narrowing was seen in 15 (29.4%) patients who underwent the meatal reconstruction using oral mucosal grafts. A unilateral lingual mucosal graft was taken in seven (13.7%) patients while bilateral strips of lingual mucosal grafts were required in 24 (47.1%) patients. In 2 (3.9%) patients, bilateral lingual mucosal grafts along with buccal mucosal grafts were required. The mean length of the graft used was 10.7cm [range 4-18; 95% confidence interval (CI) 9.4-12.1]. The mean duration of surgery was 135 minutes (range 90-180 min).

Complications

Three (5.8%) patients who had undergone lingual mucosal graft augmentation urethroplasty complained of transient difficulty in chewing and swallowing, which subsided in 3 days. Four (7.8%) patients developed urethral discharge and were treated as per the culture and sensitivity report.

Table 1. Baseline characteristics

Age (mean)	38.16 years (95% CI 34.1-42.1)
18 to 45 years	35 (68.6%)
46 to 65 years	16 (31.4%)
Duration of complaints (mean)	39.88 months (95% CI 29.6-50.1)
Etiology	
Lichen sclerosus	16 (31.4%)
Infection	4 (7.8%)
Iatrogenic	10 (19.6%)
Trauma	9 (17.6%)
Idiopathic	12 (11.5%)
Suprapubic catheter	7 (13.7%)
Previous intervention	
DVIU	11 (21.6%)
Dilatations	11 (21.6%)
Comorbidity	
Hypertension	3 (5.9%)
Diabetes	2 (3.9%)
PVR (mean) in 44 (86.3%) patients	112.07 mL (95% CI 89-135)
Qmax (mean) in 44 (86.3%) patients	4.57 mL/sec (95% CI 3.8-5.2)
Location of stricture	
Penile	12 (23.5%)
Bulbar	12 (23.5%)
Peno-bulbar	27 (52.9%)
Penile + bulbar urethra	18 (35.3%)
Pan urethral (meatus + penile + bulbar urethra)	9 (17.6%)
Length of stricture (mean)	7.59 cm (range 1-18; 95% CI 6.0-9.1)

CI: Confidence interval, PVR: Post-void residual urine volume, DVIU: Direct vision internal urethrotomy

Re-intervention

Four (7.8%) patients required reintervention at a mean of 3.5 months (range 2-9) following urethroplasty. One patient underwent redo EEA urethroplasty, another required direct vision internal urethrotomy (DVIU), while two patients required urethral dilation.

Follow-up at One Year

At one year following surgery, 4 patients (7.8%) were lost to follow up. Baseline and post-operative parameters in the 47 patients are shown in Table 3.

On subgroup analysis, there was no significant change in mean IIEF-5 scores in patients undergoing anastomotic (pre 19.47; post 19.53; p=0.85) or augmentation urethroplasty (pre 21.43; post 21.67; p=0.47). There was significant improvement in MSHQ-EjD SF score (pre 9.8; post 10.8; p=0.001) and MSHQ-EjD SF BOTHER score (pre 1.9; post 1.2; p=0.01) in patients undergoing anastomotic urethroplasty. Similarly, there was significant improvement in MSHQ-EjD SF score (pre 10.4; post 11.4; p<0.001) and MSHQ-EjD SF BOTHER score (pre 1.7; post 0.67; p<0.001) in patients undergoing augmentation urethroplasty.

Of the 47 patients available at follow-up, 14 (82.3%) out of 17 patients who underwent anastomotic urethroplasty, were "very satisfied" or "satisfied" while 3 (17.6%) were "unsatisfied" or "very unsatisfied" with the surgery, as per USS-PROM (Table 4). 27 (90%) of 30 patients who underwent augmentation urethroplasty, were "very satisfied" or "satisfied" with the surgery, while 3 (10%) patients were "unsatisfied" or "very unsatisfied". On statistical analysis, there was no significant difference in the treatment satisfaction rates between the two groups (p=0.67).

There was greater improvement in Qmax, IPSS, USS PROM and MSHQ-EjD SF scores in patients who were "Very satisfied" or "Satisfied" with urethroplasty compared to patients who were "Unsatisfied" or "Very unsatisfied" (Table 5).

Table 2. Types of surgery

Anastomotic urethroplasty	**18 (35.3%) patients**
Excision and primary anastomosis (EPA) urethroplasty	17 (33.3%)
Non-transecting urethroplasty	1 (2%)
Length of stricture (mean)	1.7 cm (95% CI 1.4-2.0)
Augmentation urethroplasty	**33 (64.7%) patients**
Dorsal onlay graft urethroplasty (Barbagli)	20 (39.2%)
Dorsal inlay graft urethroplasty (Asopa)	11 (21.6%)
Dorsolateral graft urethroplasty (Kulkarni)	1 (2%)
Dorsal plus ventral graft urethroplasty	1 (2%)
Length of stricture (mean)	10.7 cm (95% CI 9.3-12.1)
Lingual mucosal graft	31 (60.8%)
Lingual and buccal mucosal combined graft	2 (3.9%)

CI: Confidence interval

Discussion

The surgical management of urethral stricture is challenging and the diverse etiology, varied stricture characteristics and sundry surgical procedures described in the literature make the assessment of surgical outcomes a difficult task. There is a lack of consensus on the optimal protocol to be followed for the evaluation of urethroplasty outcomes. Meeks et al. (14) demonstrated an average of 3.15 different diagnostic tests for this purpose after surgery. Variable follow-up protocols and lack of standardization make comparisons between different studies difficult.

Kessler et al. (4) highlighted that subjective measures should be included in the assessment of urethroplasty outcomes. In their study, of the 30 patients who were considered a failure from a surgeon's perspective, 24 were subjectively satisfied or very satisfied with the surgical outcome. The recently published OPEN trial, comparing patient reported outcomes following open urethroplasty and endoscopic urethrotomy, has re-emphasized the importance of patient-centered evaluation of outcomes following surgical intervention for urethral strictures (15). Assessment of patient satisfaction after reconstruction is critical for patient counseling (4,16). This study evaluated the 1-year outcome of 51 patients who underwent urethroplasty for urethral stricture disease.

Uroflowmetry parameters like Qmax are commonly used for evaluating outcomes of urethral reconstruction, but these can be unreliable markers. Erickson et al. (1) demonstrated that uroflowmetry can be used to screen for postoperative stricture recurrence only when the voiding curve and urinary symptoms were also evaluated. Studies have shown that patient reported outcomes, as represented by the USS-PROM, IPSS, and QoL scores, were not diminished by the lesser improvement in Qmax (17,18). In our study, 2 (4.2%) patients despite having Qmax below 15 mL/sec (mean 14.3 mL/sec) were satisfied with the surgery as per USS-PROM and did not require reintervention.

IPSS is the most frequently used questionnaire in the evaluation of urethroplasty outcomes (3), however, it lacks specificity for urethral stricture disease and is considered inadequate for patients with urethral strictures (19). In our study, there was significant improvement in the mean IPSS score (pre 20.9; post 3.5; p<0.001) and IPSS QoL (pre 4.5; post 0.7; p<0.001).

To standardize patient-centered evaluation of interventions for urethral strictures, Jackson et al. (5) developed and validated USS-PROM. Studies have reported a significant decrease in USS PROM LUTS score and Peeling's stream picture scores, improvement in USS-PROM LUTS Likert type condition-specific QoL, EQVAS score and EQ-5D index score post urethroplasty (5,7).

In our study, there was a significant decrease in the USS PROM LUTS score (pre 14.3; post 2.1; <0.001) and Peeling's voiding picture score (pre 3.4; post 1.2; p<0.001). While comparing USS-PROM LUTS Likert type condition-specific QoL in 40 patients who were not on suprapubic catheter and who completed the follow-up after the surgery, 39 (97.5%) patients had ≥1 scale point improvement, 36 (90%) patients had ≥2 scale point improvement, and 16 (40%) patients reported a 3-scale point improvement while 1 (2.5%) patient had no improvement. There was significant improvement in the mean USS-PROM EQ 5D Visual analog scale score (pre 69.66; post 84.3; p<0.001) and USS-PROM EQ-5D index score (pre 0.78; post 0.95; p<0.001).

In a study by Jackson et al. (20), 87% patients were ''satisfied'' or ''very satisfied'' with the outcome of their urethroplasty as per USS-PROM treatment satisfaction question. In our study, 38 (80.9%) patients were "very satisfied", 3 (6.4%) patients were "satisfied", 5 (10.6%) patients were "unsatisfied" and 1 (2.1%) patient was "very unsatisfied" with the surgery. Overall, 87.3% of patients were "satisfied" or "very satisfied" with urethroplasty. There was no significant difference in treatment satisfaction between patients undergoing anastomotic urethroplasty and augmentation urethroplasty (p=0.67). Similarly, there was no significant difference in the treatment satisfaction between the two age groups at 18 45 and 46 to 65 (p=0.08). Of 6 patients (12.7%) who were "Unsatisfied" of

Table 3. Baseline and postoperative mean of PVR, Qmax, IPSS, IPSS QoL, IPSS, IIEF-5 and MSHQ EjD

n=47	Preop	Postop	Mean Diff	95% CI Diff		p
PVR (mL)	115.2	22.1	93.07	75.2	111	<0.001
Qmax (mL/sec)	4.48	18.33	-13.9	-15.1	-12.6	<0.001
IPSS	20.93	3.55	17.37	16.1	18.69	<0.001
IPSS QoL	4.55	0.77	3.787	3.44	4.13	<0.001
Urethral stricture surgery patient-reported outcome measure (USS-PROM)						
LUTS SCORE	14.3	2.15	12.15	11.1	13.22	<0.001
Peeling's stream picture score	3.48	1.23	2.25	2.02	2.47	<0.001
LUTS QOL	2.48	0.2	2.27	2.04	2.5	<0.001
EQ-5D VAS	69.66	84.3	-14.6	-16	-13.3	<0.001
EQ-5D TTO	0.78	0.95	-0.16	-0.2	-0.14	<0.001
International index of erectile function (IIEF-5)						
IIEF-5	20.72	20.89	-0.17	-0.64	0.3	0.471
Male Sexual Health Questionnaire Short Form (MSHQ EjD)						
MSHQ-EjD SF	10.25	11.28	-1.03	-1.26	-0.79	<0.001
MSHQ-EjD SF bother/satisfaction	1.75	0.8	0.95	0.72	1.17	<0.001

PVR: Post-void residual urine volume, CI: Confidence interval, USS: Urethral stricture surgery, PROM: Patient-reported outcome measure, IPSS: International Prostate Symptom Score, MSHQ-EjD SF: Male Sexual Health Questionnaire Ejaculatory Dysfunction Short Form, LUTS: Lower urinary tract symptoms, IIEF-5: Abridged five-item International Index of Erectile Function

Table 4. USS PROM treatment satisfaction

USS-PROM treatment satisfaction	Frequency	Percent
Very satisfied	38	80.9
Satisfied	3	6.4
Unsatisfied	5	10.6
Very unsatisfied	1	2.1
Among patients who were "Unsatisfied" or "Very unsatisfied"		
The urinary condition did not improve	4	66.7
The urinary condition improved but there was some other problem	2	33.3
The urinary condition did not improve and there was some other problem as well	0	0.0

USS: Urethral stricture surgery, PROM: Patient-reported outcome measure

"Very unsatisfied" with the outcome of surgery, 4 patients (66.7%) stated that "The urinary condition did not improve" and 2 patients (33.3%) stated that "The urinary condition improved but there was some other problem". Both of these patients had reported bothersome sexual dysfunction following urethroplasty. There was a significant difference in post- surgery IIEF- 5 in "Unsatisfied/Very unsatisfied" group (18.0) versus "Very satisfied/Satisfied" group (21.3) (p=0.008), whereas, there was no difference in post- surgery MSHQ-EjD SF (p=0.34) and MSHQ-EjD SF bother/satisfaction (p=0.551) in these two subsets. The lack of inclusion of the sexual function domain in USS-PROM is a shortcoming, which needs to be addressed because sexual function outcomes are a vital component of outcome evaluation following urethroplasty. Likewise, USS-PROM does not address the cause of treatment dissatisfaction due to "other problems".

Many studies have addressed the concerns regarding the effect of urethroplasty on sexual function (21,22). Patel et al. (23) did not find statistically significant differences in IIEF-5 scores before and after penile urethroplasty in 25 men. Similarly, in our study, there was no significant change in the mean IIEF-5 score between baseline and postoperative values in patients undergoing both anastomotic and augmentation urethroplasty.

MSHQ-EjD Short Form, was developed and validated for assessing ejaculatory dysfunction (EjD) in 2007 (11). Patel et al. (23) did not find a significant difference in MSHQ-EjD score in 20 men after penile urethroplasty. On the contrary, Sharma et al. (12) and Erickson et al. (22) found significant improvement in ejaculatory function after undergoing penile urethroplasty using the O'Leary Brief Male Sexual Function Inventory. In our study, there was significant improvement in MSHQ-EjD SF and MSHQ-EjD SF BOTHER scores in patients undergoing anastomotic urethroplasty as well as augmentation urethroplasty.

The technical success of urethroplasty is conventionally defined by the need for reintervention for recurrent urethral narrowing following urethroplasty. The recurrence of urethral stricture following urethroplasty ranges between 2% and 36.4%, with 75% treatment failures occurring within the first six months of surgery (14,24-26). Jackson et al. (20) reported that 15% patients in their study required surgical reintervention at a mean of 8 months after urethroplasty. In our study, four (7.8%)

Table 5. Distribution of various parameters in USS PROM treatment satisfaction groups

USS-PROM treatment satisfaction		Pre-surgery	Post-surgery	Mean Diff	95% CI Diff		p
					Lower	Upper	
Unsatisfied/very unsatisfied	Qmax	3.6	11.0	-7.3	-9.4	-5.3	0.001
	IPSS	21.4	9.8	11.6	5.2	18.0	0.007
	IPSS QoL	4.7	2.8	1.8	0.0	3.6	0.048
	USS PROM luts score	15.2	6.2	9.0	4.1	13.9	0.007
	Peeling's stream picture	3.6	2.4	1.2	0.2	2.2	0.033
	LUTS QOL	2.8	1.6	1.2	-0.2	2.6	0.07
	EQ-5D VAS	67.7	74.5	-6.8	-14.3	0.7	0.066
	EQ-5D TTO	0.8	0.8	0.0	-0.1	0.1	0.749
	IIEF-5	18.2	18.0	0.2	-0.9	1.2	0.695
	MSHQ-EjD SF	10.6	11.2	-0.6	-1.3	0.1	0.07
	MSHQ-EjD SF bother/satisfaction	1.4	0.8	0.6	-0.1	1.3	0.07
Very satisfied/satisfied	Qmax	4.6	19.4	-14.8	-15.9	-13.7	<0.001
	IPSS	20.9	2.7	18.2	17.1	19.3	<0.001
	IPSS QoL	4.5	0.5	4.1	3.8	4.3	<0.001
	USS PROM luts score	14.2	1.6	12.6	11.6	13.6	<0.001
	Peeling's stream picture	3.5	1.1	2.4	2.2	2.6	<0.001
	LUTS QOL	2.4	0.0	2.4	2.3	2.6	<0.001
	EQ-5D VAS	70.0	85.7	-15.8	-16.7	-14.8	<0.001
	EQ-5D TTO	0.8	1.0	-0.2	-0.2	-0.2	<0.001
	IIEF-5	21.1	21.3	-0.2	-0.8	0.3	0.408
	MSHQ-EjD SF	10.2	11.3	-1.1	-1.3	-0.8	<0.001
	MSHQ-EjD SF bother/satisfaction	1.8	0.8	1.0	0.8	1.3	<0.001

USS: Urethral stricture surgery, PROM: Patient-reported outcome measure, CI: Confidence interval, IPSS: International Prostate Symptom Score, MSHQ-EjD SF: Male Sexual Health Questionnaire Ejaculatory Dysfunction Short Form, LUTS: Lower urinary tract symptoms, IIEF-5: Abridged five-item International Index of Erectile Function, VAS: Visual analogue scale

patients required reintervention at a mean of 3.5 months after urethroplasty. One patient underwent EEA urethroplasty, while another required DVIU and two patients required urethral dilation. Thus, the overall technical success rate was 91.5% whereas 87.3% patients were satisfied as per the USS-PROM following urethroplasty. 4.2% of patients were unsatisfied with the surgery for reasons other than urinary complaints.

This study highlights that subjective changes in PROM complement objective measurement of urinary parameters in the evaluation of men undergoing urethroplasty for anterior urethral strictures.

Study Limitations

This study had certain limitations. The patient cohort was heterogeneous with varied stricture characteristics. Likewise, the types of urethral reconstruction procedures performed were heterogeneous, as is expected in this cohort of patients. The number of patients in the study was relatively small and the follow-up duration was limited to one year. Whether treatment satisfaction rates would be sustained in longer follow up is an issue that needs to be addressed. The lack of validation of the Hindi language translation of the questionnaires used in the study is another drawback of the study.

Conclusion

Patient-reported outcome measurements play an important role in evaluating the outcome of urethroplasty in men with urethral stricture disease and should be used concomitantly with objective measurements like Qmax and PVR. This helps in evaluating the outcomes of surgery in the form of patient satisfaction and quality of life.

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Ethics

Ethics Committee Approval: The Local Institutional Ethics Committee (no: 2018/EC/781, date: 31.01.2018) approved this study.

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Authorship Contributions

Surgical and Medical Practices: S.D., V.P., R.N., S.K., S.P., H.S., U.S.D., S.T., Concept: S.D., S.T., Design: S.D., S.T., Data Collection or Processing: S.D., V.P., R.N., S.K., S.P., H.S., U.S.D., S.T., Analysis or Interpretation: S.T., Literature Search: S.D., R.N., S.P., S.T., Writing: S.D., S.T.

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