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MP78-08 OUTCOMES OF URETHROPLASTY FOR SYNCHRONOUS ANTERIOR URETHRAL STRICTURE

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MP78-07

THE PREVALENCE OF CONCOMITANT SQUAMOUS METAPLASIA IN BULBAR URETHRAL STRICTURES AND ITS ASSOCIATION WITH RECONSTRUCTIVE DELAY AND URETHRAL REST BY SUPRAPUBIC URINARY DIVERSION

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INTRODUCTION AND OBJECTIVE: Squamous metaplasia (SM) of a normal urethral epithelium is considered to be the initial pathological change associated with a urethral stricture. SM proximal to a stricture is a severe problem that may affect the choice of urethroplasty technique and surgical outcome. A histological analysis was conducted to evaluate the prevalence of SM in bulbar urethral strictures and the association with delayed reconstruction and urethral rest.

METHODS: We reviewed the records of 169 male patients with bulbar urethral strictures who had undergone excision and primary anastomosis (EPA) between 2010 and 2020 by a single surgeon (AH). Those with prior urethroplasty and incomplete data were excluded from analysis. The proximal edges of formalin-fixed, paraffin-embedded urethral sections were sliced axially, and ImageJ measured the ratio of the urethral lumen in which SM was present on HE-stained slides by an experienced pathologist (MK). Reconstructive delay was calculated as the time between the initial stricture diagnosis and EPA. Urethral rest was accomplished by suprapubic tube placement and cessation of voiding at least three months before EPA. The success of EPA was defined as the absence of need for additional treatment.

RESULTS: SM was present in 88 patients (52.1%), and the median ratio of SM in the urethral lumen was 13.5%. The median reconstructive delay in patients with SM (40 months) was significantly longer than that in patients without SM (9 months, $p<0.0001$). Patients with SM were significantly more likely to have had no urethral rest ($p<0.0001$) and undergo repeat transurethral treatments such as urethrotomy and dilation before EPA ($p=0.0002$). Multivariate logistic regression analysis showed that a longer reconstructive delay (for every month: odds ratio (OR) 1.01, 95% confidence interval (CI) 1.00−1.02, $p=0.004$) and absence of urethral rest (OR 3.82, 95% CI 1.59−9.20, $p=0.002$) were significant predictors of concomitant SM. There was no significant difference in the success rates between patients with SM (82 of 88, 93.1%) and those without SM (79 of 81, 97.5%, $p=0.18$).

CONCLUSIONS: Persistent chronic high-pressure voiding due to reconstructive delay and absence of urethral rest are responsible for concomitant SM.

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MP78-08

OUTCOMES OF URETHROPLASTY FOR SYNCHRONOUS ANTERIOR URETHRAL STRICTURE

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INTRODUCTION AND OBJECTIVE: The incidence of male anterior urethral stricture disease (USD) has been well described. Less is known regarding the management strategies and outcomes in patients with synchronous USD (SUSD). SUSD is the presence of two distinct urethral strictures separated by a healthy intervening urethral segment. This study sought to assess the functional outcomes following repair of SUSD.

METHODS: Patients with documented SUSD within a multi-institutional database were retrospectively assessed and compared to patients with solitary USD. Patients who underwent single-stage or staged anterior urethroplasty, including meatoplasty and perineal urethrostomy were included. Patients with a posterior urethral stricture or bladder neck involvement were excluded. Stricture classification according to the LSE (Length, Urethral Segment, Etiology) was performed. Stricture recurrence between cohorts was assessed, defined as undergoing repeat treatment. Logistic regression was performed to assess predictors of failure.

RESULTS: 168 of the 2,299 patients had SUSD (7.3%). Patients with SUSD had a significantly shorter mean primary stricture length than those with solitary USD, 3.6 cm vs. 4.7 cm, $p<0.001$. Mean stricture length for the secondary stricture was 2.6 cm. Patients with SUSD had a larger proportion of strictures classified as S2b, S2c and S2d than in those with solitary USD ($p<0.001$). Patients with SUSD were more likely to be due to Lichen Sclerosus (LS) or hypospadias (Table 1). On univariate analysis, SUSD had a higher stricture retreatment rate, 8.0% vs. 13.1%, $p=0.02$. On multivariable analysis, SUSD was not associated with higher retreatment rates, OR 1.37 (0.79−2.28), $p=0.2$. Patients with SUSD and stage S1a, S1b, S2c, S2d and S3 stricture location demonstrated higher rates of stricture recurrence than controls (Table 2).

CONCLUSIONS: Patients with SUSD have higher rates of stricture recurrence following urethroplasty compared to patients with solitary USD on univariate analysis. Patients with LS and hypospadias are more likely to have SUSD.

Table 1—Descriptive characteristics of 2,299 patients who underwent a urethral stricture repair, grouped by presence or absence of a synchronous stricture.

	Solitary USD 2,131 (92.6%)	SUSD 168 (7.3%)	Total 2,299 (100%)	P-Value
Body Mass Index	29.8 (17.7 – 57.5)	30.6 (14.7 – 56.0)	30.0 (14.7 – 57.5)	0.20
Age at Time of Surgery	48	49	48	0.90
Smoking Status				
Active	208 (9.8%)	17 (10.1%)	225 (9.8%)	0.88
Never/Former	1,923 (90.2%)	151 (89.9%)	2,074 (90.2%)	
Number of Prior DVIUs	0.88 (0.00 – 10.00)	0.95 (0.00 – 7.50)	0.88 (0.00 – 10.00)	0.63
Number of Prior Dilations	1.6 (0.00 – 10.00)	1.4 (0.00 – 10.00)	1.6 (0.00 – 10.00)	0.51
Operative Stricture Length #1	4.7 (0.20 – 25.00)	3.6 (0.50 – 17.00)	4.6 (0.20 - 25.00)	< 0.001
Operative Stricture Length #2	-	2.6 (0.50 – 12.00)	-	-
S Stage #1*				
S1a	947 (44.4%)	57 (33.9%)	1,004 (43.7%)	< 0.001
S1b	362 (17.0%)	16 (9.5%)	378 (16.4%)	
S2a	214 (10.0%)	10 (6.0%)	224 (9.7%)	
S2b	226 (10.6%)	36 (21.4%)	262 (11.4%)	
S2c	140 (6.6%)	25 (14.9%)	165 (7.2%)	
S2d	114 (5.3%)	18 (10.7%)	132 (5.7%)	
S3	128 (6.0%)	6 (3.6%)	134 (5.8%)	
S Stage #2*				
S1a		68 (40.5%)		
S1b		19 (11.3%)		
S2a	-	9 (5.4%)	-	-
S2b		31 (18.5%)		
S2c		6 (3.6%)		
S2d		15 (8.9%)		
Other		20 (11.9%)		
E Stage†				
1	205 (9.6%)	11 (6.5%)	216 (9.4%)	< 0.001
2	919 (43.1%)	46 (27.4%)	965 (42.0%)	
3a	259 (12.2%)	24 (14.3%)	283 (12.3%)	
3b	241 (11.3%)	30 (17.9%)	271 (11.8%)	
3c	105 (4.9%)	5 (3.0%)	110 (4.8%)	
4	30 (1.4%)	0 (0.0%)	30 (1.3%)	
5	136 (6.4%)	18 (10.7%)	154 (6.7%)	
6	154 (7.2%)	27 (16.1%)	181 (7.9%)	
Repair type				
Substitution	1,442 (67.7%)	96 (57.1%)	1,538 (66.9%)	< 0.001
Anastomotic	170 (8.0%)	7 (4.2%)	177 (7.7%)	
Excisional	161 (7.6%)	27 (16.1%)	188 (8.2%)	
Perineal Urethrostomy	199 (9.3%)	3 (1.8%)	202 (8.8%)	
Hypospadias	27 (1.3%)	0 (0.0%)	27 (1.2%)	
Meatoplasty	12 (0.6%)	11 (6.5%)	23 (1.0%)	
Fistula	22 (1.0%)	0 (0.0%)	22 (1.0%)	
Other	98 (4.6%)	24 (14.3%)	122 (5.3%)	

***(S):** S1a = proximal bulb; S1b = distal bulb; S2a = bulbar/penile; S2b = penile only; S2c = penile/fossa; S2d = fossa only; S3 = bulb/penile/fossa
†(E): E1 = external trauma; E2 = idiopathic; E3a = internal trauma; E3b = urethroplasty failure; E3c = radiation; E5 = hypospadias; E4/6 = inflammatory/lichen sclerosus
USD: Urethral Stricture Disease; SUSD: Synchronous Urethral Stricture Disease; DVIU: Direct Visual Internal Urethrotomy

Table 2—Descriptive characteristics of recurrence in patients who underwent a urethral stricture repair, grouped by presence or absence of a synchronous stricture.

	Control Group 2,131 (92.6%)	Study Group 168 (7.3%)	Total 2,299 (100%)	P-Value
Retreatment*¶				
Functional Success	1960 (92.0%)	146 (86.9%)	2106 (91.6%)	0.02
Functional Failure	171 (8.0%)	22 (13.1%)	193 (8.4%)	
Retreatment: Endoscopic†				
No	2011 (94.4%)	151 (89.9%)	2162 (94.0%)	0.02
Yes	120 (5.6%)	17 (10.1%)	137 (6.0%)	
Retreatment: Revision Urethroplasty				
No	2,055 (94.4%)	158 (94.4%)	2,213 (96.3%)	0.1
Yes	76 (5.6%)	10 (6.0%)	86 (6.0%)	
Recurrence Length (cm)	2.1 (0.0 – 12.0)	1.3 (0.0 – 7.0)	2.0 (0.0 – 12.0)	0.12
Functional Failure* § (Patients with functional failure/total)	52/947 (5.5%)	7/57 (12.3%)	-	
S1a	38/362 (10.5%)	3/16 (18.8%)		
S1b	27/214 (12.6%)	1/10 (10.0%)		
S2a	22/226 (9.7%)	1/36 (2.8%)		
S2b	14/140 (10.0%)	4/25 (16.0%)		
S2c	4/114 (3.5%)	4/18 (22.2%)		
S2d	14/128 (10.9%)	2/6 (33.3%)		
S3`				
Recurrence Location				
Excisional Anastomosis	27/2104 (1.3%)	8/160 (4.8%)	35/2264 (1.5%)	< 0.001
Proximal Graft	29/2102 (1.4%)	4/164 (2.4%)	33/2266 (1.4%)	0.29
Distal Graft	32/2099 (1.5%)	6/162 (3.6%)	38/2261 (1.7%)	0.04
Mid Graft	39/2092 (1.8%)	8/160 (4.8%)	47/2252 (2.0%)	0.01
Other	22/2109 (1.0%)	11/157 (6.5%)	33/2266 (1.4%)	<0.001
Number of DVIUs as treatment for recurrent urethral stricture	1.13 (1.00 – 2.00)	1.22 (1.00 – 2.00)	1.14 (1.00 – 2.00)	0.48
Number of urethral dilations as treatment for recurrent urethral stricture	1.23 (1.00 – 4.00)	1.22 (1.00 – 3.00)	1.23 (1.00 – 4.00)	0.98

* Described as undergoing any form of treatment for recurrence, includes clean intermittent catheterization, DVIU, dilation or revision urethroplasty.
¶ Patients who underwent both endoscopic management and revision urethroplasty were documented as a single event
† Includes clean intermittent catheterization, DVIU or dilation.
§ **(S):** S1a = proximal bulb; S1b = distal bulb; S2a = bulbar/penile; S2b = penile only; S2c = penile/fossa; S2d = fossa only; S3 = bulb/penile/fossa

Source of Funding: None

MP78-09

SALVAGE DIRECT VISION INTERNAL URETHROTOMY FOR AFTER FAILED SUBSTITUTION URETHROPLASTY: EXTENDED LONG-TERM FOLLOW-UP FROM A RECONSTRUCTIVE REFERRAL CENTER

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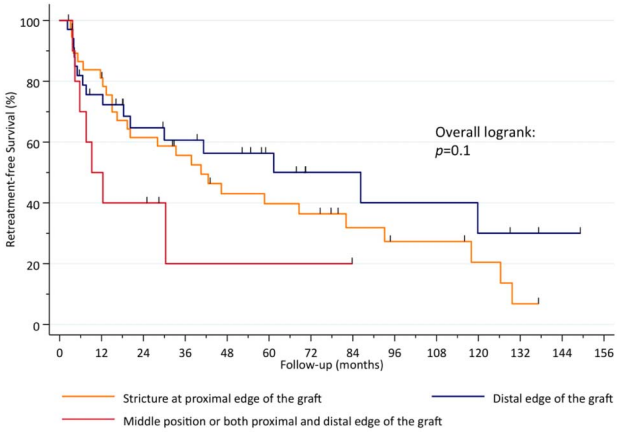
INTRODUCTION AND OBJECTIVE: There is controversy regarding the optimal salvage treatment option for stricture recurrence after anterior buccal mucosal graft urethroplasty (BMGU). Data on retreatment modalities and their outcomes are scarce. Thus, we aimed to report on our extended follow-up of patients undergoing direct vision internal urethrotomy (DVIU) for short, veil-like recurrences after anterior BMGU.

METHODS: We included all men undergoing salvage DVIU for recurrence with short segment, anastomotic fibrous rings after prior BMGU at our center between 2009-2021. We recorded clinical characteristics such as stricture location relative to the buccal graft (proximal, middle, distal), time from BMGU to DVIU in months, and etiology. Primary endpoint was retreatment-free survival after salvage DVIU. Kaplan-Meier analysis was performed for censoring and subsequent treatment modalities in the case of recurrence after salvage DVIU were extracted.

RESULTS: Overall, 105 patients underwent DVIU after BMGU for bulbar (66%), penobulbar (16%), penile (15%), or membranous stricture (2.9%). 45% of strictures were proximal of the graft, 43% distal, and 12% were located in a middle position or both proximal and distal of the graft. The majority of strictures were iatrogenic (67%), followed by idiopathic (13%), inflammatory (9.6%), and posttraumatic etiology (7.7%). Median time from BMGU to salvage DVIU was 10 mo (IQR 4.2-28). 13 men (12%) were lost to follow-up and at a median follow-up of 74 mo (IQR 32-127), 53 men (58%) suffered from stricture recurrence (median time to recurrence: 15 mo [IQR 5.0-41]). 12-mo retreatment-free survival was 86%, 82%, and 70% for proximal, distal, and middle/both proximal+distal stricture position, respectively ($p=0.1$; Figure 1). In patients recurring after salvage DVIU, most subsequent interventions consisted of redo BMGU (46%) and redo salvage DVIU (31%).

CONCLUSIONS: Salvage DVIU for veil-like, short segment recurrences remains a limited but viable endoscopic treatment option after anterior BMGU. Pending larger multi-institutional validation, the benefit of DVIU appears more pronounced for anastomotic rings developing at the distal edge of the buccal graft.



Source of Funding: n/a

MP78-10

IMPROVING PREDICTIVE UTILITY OF URETHRAL STRICTURE CLASSIFICATION SYSTEMS BASED ON SURVIVAL ANALYSIS OF STRICTURE-SPECIFIC VARIABLES

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INTRODUCTION AND OBJECTIVE: Urethroplasty is generally regarded as the most effective treatment of urethral stricture. However, recurrences and complications can occur even in the most skilled hands and reliably predicting these outcomes remains elusive. Several existing classification systems (U-Score and LSE) exist but remain largely unvalidated. The purpose of this study is to examine stricture-specific factors associated with recurrence after anterior urethroplasty in order to better refine existing classification systems.

METHODS: A retrospective review was performed of men undergoing anterior urethroplasty at a single center from 2003-2021. Stricture-specific variables of location, etiology, length, number, prior urethroplasty and previous endoscopic treatment were identified. Additionally, U Scores (US) and LSE Scores were calculated. Success was defined as easy passage of a flexible cystoscope at routine follow-up with no change in urinary function thereafter. Complications were defined as a Clavien >1 complication during the 90-day perioperative time period. Associations between clinical variables and stricture recurrence were evaluated using univariable and multivariable Cox regression analysis. Variables independently associated with stricture recurrence were sub-stratified using Kaplan-Meier analysis and arranged into a survival-analysis based classification system. Receiver operator characteristic (ROC) analysis was performed on U-Score (US), LSE and refined classification system.

RESULTS: 1573 patients underwent anterior urethroplasty over the study period with a median patient age of 47 years (IQR 34-59) and stricture length of 4 cm (IQR 3-6). Urethroplasty success was 92.0% (1447) at a median follow-up of 90 months. On multivariable Cox regression, stricture length (Hazard Ratio 1.09, 95%CI 1.04-1.16, $p=0.001$), etiology (HR 1.16, 95%CI 1.06-1.28, $p=0.002$), revision urethroplasty (HR 1.56, 95%CI 1.07-2.28, $p=0.02$), stricture number (HR 2.34, 95%CI 1.01-7.43, $p=0.05$), and location (HR 1.32, 95%CI 1.04-1.68, $p=0.02$) were independently associated with stricture recurrence after anterior urethroplasty. On Kaplan-Meier analysis there was clustering within each independent variable which allowed revision to a stricture-specific classification termed "LERNS" (Length, Etiology, Revision, Number and Segment). On ROC analysis, area under the curve (AUC) for LERNS indicated excellent discrimination