#25353: THE EFFECT OF WELL MANAGED LOWER URINARY TRACT DYSFUNCTION ON THE SUCCESS RATE OF ENDOSCOPIC SUBURETERIC INJECTION FOR LOW - MODERATE VESICOURETERAL REFLUX

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Hypothesis / aims of study

Endoscopic subureteric injection (STING) stands out as a widely used, reliable and effective minimally invasive surgical technique in the treatment of vesicoureteral reflux (VUR).

The success rate of STING has been reported to be related to some factors such as reflux grade, surgical technique, ureteral orifice anatomical abnormalities and other complicating factors such as lower urinary tract dysfunction (LUTD)

Although LUTD is a common and plausible condition, able to decrease the success rate in endoscopic correction, therefore it is recommended to treat LUTD before the treatment of VUR to achieve better outcomes.

Since then, the LUT parameters might be similar between the successfully treated reflux patients and those with persistence of VUR after treatment.

To our knowledge, no study specifically focuses on objective LUT parameters as a factor in the success of STING. Moreover, treated LUTD has not been specifically studied as a factor for STING success.

We aimed to study the presence of lower urinary tract dysfunction (LUTD) and those objective parameters obtained from voiding diary (VD), uroflowmetric (UF) and postvoiding residual urine (PVR) and voiding dysfunction symptom score (VDSS) as possible factors affecting the success rate on STING to correct VUR.

Study design, materials and methods

Children who underwent STING for the first time due to low (I-II) and moderate (III) grade of VUR in our clinic between 2012 and 2022 were included. All records were evaluated retrospectively.

All children diagnosed with VUR were routinely evaluated for LUTD with VD, UF, PVR and Voiding Dysfunction Symptom Score (VDSS)

STING was performed under general anesthesia by a pediatric cystoscope when the urine culture was sterile. Dextranomer/hyaluronic acid copolymer paste was used and the injection was delivered to the affected ureteral orifice at 6 o'clock until the required orificial appearance was achieved.

All children underwent control VCUG at the 6th postoperative month.

Renal units were divided into two groups according to the presence of postoperative VUR: Group 1, those with no VUR (successful), and Group 2, those with unresolved VUR (failure).

Demographic characteristics, DMSA scintigraphy findings and voiding parameters (voiding frequency and urgency/incontinence in VD, maximum flow rate (Qmax), flow pattern (normal/ abnormal), maximum bladder capacity (MBC)/expected bladder capacity (EBC) in UF and VDSS) were compared between the two groups.

Results

A total of 80 children (73 (91.3%) girl, 7 (8.8%) boy) with a median age of 8 (3-16) years were included in the study with a total of 112 Rus. 48 of which are unilateral and 32 bilateral. 48 (60%) children had unilateral VUR, and 32 (40%) bilateral VUR. 38 (33.9%) grade 1 VUR, 39 (34.8%) grade 2 and 35 (31.3%) grade 3 were detected.

VUR was not detected in control VCUG following STING procedure in 93 (83%) of 112 RUs (group 1 (successful STING): 93 RUs, group 2 (failed STING): 19). The success rate was 83.3% (40/48 RU) in children with unilateral VUR and 82.8% (53/64 RUs) in bilateral VUR.

Febrile UTI, constipation, VUR phase, grade, DMSA findings, abnormal UF pattern, and urinary incontinence in VD were similar between the two groups (Table 1). Also no difference was found between those groups in terms of daytime voiding frequency, Qmax, MBC/EBC, PVR and VDSS (Table 2).

The coexistence and relationship of LUTD and VUR has been reported many times. In our study, we studied children with only primary low-moderate VUR and the LUTD rate was 26.25% (21/80). In the Swedish reflux study, LUTD, in which voiding symptoms were predominant, was detected in 20% of children aged 1 to 2 years with grade 3-4 reflux [1].

Despite the guideline-based experience, there are some studies reports conflicting results. In a study evaluating 54 children with high-grade VUR and bladder dysfunction as a subgroup, it was reported that a cure rate of 83% was achieved after 1 to 3 endoscopic interventions. The authors concluded that bladder dysfunction is not a contraindication of STING [2].

In another study including 200 children aged between 2 and 15, it was found that the presence of LUTD increased the failure of endoscopic surgery by 2.493 times [3].

In our retrospective study, children who underwent endoscopic intervention for low-moderate VUR were evaluated, and no difference was found in objective LUT parameters between successful and failed STING groups. The present study stands out in terms of comparing parameters such as flow pattern and rate, bladder capacity, symptom score and PRV between groups for the first time according to the results of STING unlike other published studies evaluated based solely on the diagnosis of LUTD.

Conclusions

In the present series, which was homogeneous in terms of age, VUR grade, renal cortical damage, surgical technique, and volume of injected material, it was found that there was no difference in preoperative parameters of VD, UF, PVR and VDSS between successful and failed endoscopic correction.

Therefore, we believe that effectively treated preoperative LUTD provides a comparable STING success rate for correcting low to moderate-grade vesicoureteral reflux (VUR) in the short term.

Table 1. Comparison of characteristic features between two groups

		Group 1		Group 2		P value
		(n=93)	%	(n=19)	%	
Gender	**Boy**	6	6.5	4	21.2	0.064
	Girl	87	93.5	15	78.9	
Febrile UTI	**Presence**	66	71	14	73.7	0.527
	Absence	27	29	5	26.3	
Constipation	**Presence**	8	8.6	1	5.3	0.612
	Absence	85	91.4	17	89.5	
VUR phase	**Filling**	83	89.2	19	100	0.288
	Voiding	10	10.8	0	0	
VUR grade	**Grade 1**	34	36.6	4	21.1	0.366
	Grade 2	32	34.4	7	36.8	
	Grade 3	27	29	8	42.1	
Abnormal DMSA findings	**Normal**	33	35.5	6	31.6	0.798
	Abnormal	60	64.5	13	68.4	
UF Pattern	**Normal**	78	83.9	17	89.5	0.733
	Abnormal	15	16.1	2	10.5	
Incontinence in VD	**Presence**	13	86	5	26.3	0.195
	Absence	80	14	14	73.7	

(VUR: vesicoureteral reflux, UTI: urinary tract infection, VD: voiding diary)

Table 2. Comparison of age and lower urinary tract parameters between two groups

	Group 1 n=93		Group 2 n=19		P value
	Median	Min-Max	Median	Min-Max	
Age (years)	8	3-16	8	3-16	0.444
Daytime voiding frequency	5	3-16	6	4-10	0.625
Qmax (ml/sn)	20	8-45	19	8-48	0.904
MBC/ EBC (%)	83.33	26.94-240.00	83.05	45.71-144	0.754
PVR (ml)	7	0-70	10	0-70	0.214
VDSS	4	0-31	3	0-25	0.922

(Qmax: maximum flow rate, MBC: maximum bladder capacity, EBC: expected bladder capacity by age, PVR: postvoiding residual urine, VDSS: Voiding Dysfunction Symptom Score)

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