

series 73% of infants with VUR were males. Another striking finding which corresponded with other studies (10,11,12) was that VUR in infants was generally of a higher grade. In vast majority of our patients (Table-II) Grade of VUR was more than II. It may be that because of its severity, VUR presents early in infancy. It therefore must be treated early and vigorously.

14 of our patients received STING in first year of life (Group-I) and eight patients in second year (Group-II). The results in the two groups were almost the same. The success rate of STING therapy depended on the severity of VUR and not on the timing of the STING procedure.

Conclusions

1. VUR was seen only in full term infants.
2. 73% of the infants involved were male.
3. Failure of Sting procedure was related to the severity of VUR and not to the timing of Sting procedure.
4. STING procedure can safely be performed in the very young infant without significant morbidity.
5. Success rate overall is 90%. STING procedure can therefore safely be recommended to treat VUR and major surgery like ureteric reimplantation can be avoided in most cases.

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ible Cannula (5). The follow up ranged from 1-4 years.

Results

Total number of 26 patients with 47 refluxing ureters presented during the period of this study. 19 (73%) patients were male and 7 (23%) female. VUR was bilateral in 21 and unilateral in 5. All patients were found to be full term.

The grades of VUR found in the refluxing ureters in the series are shown in Table-2.

Table # 2

Grade:	No. of Ureters
I	0
II	3
III	28 Two of these had pyelo-tubular reflux as well.
IV	14
V	2
Total	47

The age at presentation varied from one week to 11 months (mean 5 months). Presenting features are shown in table-3. 22 patients had endoscopic submucosal Teflon (Polytef) Injection (Sting). In one patient the attempt to inject polytef was a technical failure. 14 infants received String in 1st year of life (Group-I) and the rest of 8 in 2nd year of life (Group-II). There was no untoward effect of endoscopy on infant urethra.

Table # 3

Presenting features	No.
Irritability	26
Fever	26
Off feeds	26
Vomiting	10
Foul smelling urine	3
Convulsions	1
Vulvitis	1

Five patients had persistent post operative urinary tract infections. Three patients from Group-I and one patient from Group-II had failure of repeated Sting procedures and needed ureteric reimplantation. All of these had severe (grade IV-V) VUR. The failure of Sting in these patients was not related to the time of Sting procedure but was rather related to the severity of the reflux. One patient needed nephroureterectomy on one side because of a very severe reflux nephropathy resulting in a contracted scarred non-functioning kidney.

18 patients were cured by STING. In two patients post STING follow up was still awaited. Table-IV shows the result of STING procedure in cured patients.

Table # 4

Successful-after 1st STING	12 (54.8%)
after 2nd STING	16 (72.7%)
after 3rd STING	17 (77.0Y)
after 4th STING	18 (81.8%)

Discussion

Endoscopic Submucosal Teflon Injection (STING) is now a widely established technique of treating vesico-ureteric reflux (VUR) in children (6,7), since its introduction in 1981 by Matouscheke (8,9).

However there has been no published study of its application in infants. We have successfully carried out STING procedure in infants without any difficulty. Owing to the small size of urethra, all the infants were calibrated before introduction of the cystoscope.

All the infants with VUR happened to be full term. This finding needs further evaluation. Is VUR a disease of full term babies? What goes wrong in last weeks of gestation causing reflux?

In infants VUR is more common in males (10,11,12) as compared to older children in whom it is much more common in females (6,7). In our

VESICoureTERIC REFLUX IN INFANTS: ENDOSCOPIC MANAGEMENT

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Abstract

Over a period of six years (1984-90) 26 infants presented with Urinary Tract Infection (UTI) and were diagnosed as having vesico-ureteric reflux (VUR). 19 (73%) of them were male and seven (23%) female. All of them were full term.

22 patients had severe VUR and were treated endoscopically with Submucosal Teflon (polytef) Injection (STING). 18 patients were cured by this procedure. Failures were related to severity of VUR (Grade IV-V) and were subsequently treated by ureteric reimplantation. There were no untoward effects of endoscopy on infant urethra.

STING procedure can safely be performed in infants for the management of vesico-ureteric reflux and is recommended as procedure of first choice before embarking upon extensive procedure like reimplantation of ureters.

Key Words: Vesicoureteric Reflux, Submucosal teflon injection.

Introduction

About 90% of renal scarring and related hypertension is associated with Vesico Ureteric Reflux (VUR) and VUR is found in over 1/3 of children investigated for UTI (1,2). It is therefore important to detect it as early as possible and treat it vigorously. Endoscopic correction by Polytef Paste injection at the 6 'O' clock position of refluxing ureteric orifice has now been one of accepted treatments for control of VUR. Other substitutes like blood or bovine collagen have also been used

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as an alternative to teflon paste for subureteric injection (3,4).

In this article we present our experience of Submucosal Teflon (Polytef) Injection (STING) for the control of VUR in infants.

Patients and Methods

All the infants that presented with UTI to our department from 1984-1990 were included in this study of 26 patients (47 refluxing ureters). 19 (73%) were male and 7(23%) female.

Proven UTI and presenting features were recorded. Mid Stream Urine, Intravenous Urogram and later urinary tract ultrasound and micturating cystogram were performed on all. Diethylene Triamine Penta Acetic Acid (DTPA) scans were done on some with poor renal function particularly those who had evidence of renal scarring on IVU/renal ultrasound. All of these patients were treated with antibiotics initially therapeutically and later prophylactically. The decision to Endoscopic correction of VUR by polytef injection was based on the indications mentioned in table 1.

Table # 1
Indications for Endoscopic Correction of VUR.

1. Breakthrough of UTI inspite of antibiotic prophylaxis.
2. Renal scarring.
3. VUR III-V
4. Pyelotubular reflux.

The amount of teflon paste injected at each ureteric orifice varied from 0.05 to 0.5 ml (mean 0.275 ml) using 10F cystoscope and Puri 5F flex-