



## ENDOSCOPIC TREATMENT OF REFLUX WITH DEFLUX –TERTIARY CARE CENTER EXPERIENCE

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**ABSTRACT** **Background.** A number of bulking agents have been used for the endoscopic correction of Vesicoureteral reflux in children. We present our long-term results of endoscopic use of dextranomer/hyaluronic acid copolymer (Deflux®) for VUR treatment in children.

**Patients and methods.** Between 2014 and 2017, 40 children underwent endoscopic subureteral injection of Deflux® in 50 ureters. 30 children had unilateral reflux and 10 had bilateral reflux. Median age was 5-years (6-months to 14.9-years) 3month postoperatively, a voiding cystourethrogram was performed. Age, sex, grade of reflux and treatment results were recorded and evaluated. Successful reflux correction was defined as downgrading or disappearance on follow-up VCUG

**Results.** No intra- or postoperative complications had been noticed. In 32 ureters (80%), VCUG showed no VUR 3month postoperatively. Two children received a 2nd Injection (two successful). In 6 ureter reflux persist(15%) & were converted to open surgery.

**Conclusion.** Endoscopic treatment of vesicoureteral reflux can be recommended as a first-line therapy for most cases of vesicoureteral reflux, because of the short hospital stay, absence of complications and the high success rate.

**KEYWORDS :** Vesicoureteral reflux; Deflux

### Introduction:

Vesicoureteric reflux (VUR) is a common problem encountered by pediatric urologists. Traditionally, if medical management with low-dose antibiotic prophylaxis failed, the only alternative was ureteral reimplant surgery [1]. Since Matouschek's initial description of the subureteric injection technique in 1981 [2] and the first clinical series reported by O'Donnell and Puri in 1984 [3], it has evolved into a therapeutic alternative to ureterocystostomy.

The recent surgical treatment modalities of VUR disease are open and endoscopic surgery.

The endoscopic treatment may be chosen as an alternative to open surgery because of low morbidity and mortality rates, lower cost, short term of hospital stay, and similar results to open surgery [4].

We present the recent results of endoscopic treatment using the subtrigonal injection of Deflux for VUR in children by the same operator at our institute.

### MATERIALS AND METHODS

We retrospectively reviewed all cases of subtrigonal injection performed with Deflux from 2014 to 2017 at bai jerbai wadia hospital. All patients who entered into the study had vesicoureteric reflux, as determined by voiding cystourethrogram (VCUG).

### Indications

All the patients of vur needing surgical intervention as per conventional indications were given option of endoscopic as well as open surgery.

However in following instances deflux was preferred Infants of vur with breakthrough UTI, presence of bowel bladder dysfunction, secondary vur and parental preference.

The technique comprises a subureteric or intra-ureteric transurethral injection of Deflux with a pediatric cystoscope. A 20-gauge needle is inserted 2 to 3 mm proximal to the ureteral orifice and delivers the material underneath the ureter at the 6 o'clock position for the subureteric technique. Alternatively, for the intra-ureteric technique,

the needle is inserted in the floor of the intravesical ureter, which is visualized by directing the cystoscope water flow at the orifice to be treated. This latter technique was usually used for high-grade reflux with wide opening orifices.9 The injection proceeded until we obtained a "bulge" with an elevated, inverted crescent shape of the orifice. Patients were maintained on their antibiotic prophylaxis until reflux was documented to be absent on postoperative cystogram. Patients were subjected to VCUG at 3month postoperative Patients who failed initial injection were offered continued observation, a second injection or ureteroneocystostomy.

Primary outcome comprised reflux status (resolution v. non resolution) The outcomes were analysed statistically

### RESULTS

Between January 2014 and January 2017, 40 children were treated minimally invasively with dextranomer/hyaluronic acid. 10 children had bilateral and 30 children had unilateral reflux. Consequently subureteral injection was performed in 50 ureters in total.

Medium operating time was 12 minutes (6-20 minutes). There was no case of perioperative complications. In our study 4 had grade II reflux, 20 had grade III reflux, and 16 had grade IV reflux and 10 had grade v reflux. All patient were put on chemoprophylaxis.

VCUG performed after 3 month in all patient Out of 40 ureter 32 (80%), postoperative MCU showed no reflux. The success rates with regard to the grade of reflux are depicted in Table 1

No of patient	Downgrading of reflux	Disappearance of reflux	Persistence of reflux	Disappearance after 2 <sup>nd</sup> inj
40	2	32	6	2
percentage	5%	80%	15%	5%

6 children were re-injected using the HIT-technique. Two children were reflux- and infection-free after the 2nd injection, which equates to a success rate of 33%.

The remaining 4 children with unsuccessful injection (one patient with reflux grade III and one patient with reflux grade IV and 3 patient with grade IV) underwent re implantation

**Table 2-rRetrovesical dia ureteric diameter vs reflux o**

Sr no	Lower ureteric dia	Reflux	Disapperance of reflux	Persistence of reflux
1	4-6mm	8	8	0
2	6-8mm	22	21	1
3	8-10mm	10	8	2
4	>10mm	10	7	3

We evaluated retrovesical dia as predictor for success and need of multiple injection. Discussion The concept of subureteral injection was introduced by O'Donnell and Puri in the 1980s to create a less invasive treatment for VUR [5]. Endoscopic treatment is based on the principle of creating a solid support behind the intravesical ureter and elongating the intramural length of the ureter [6]

In children biologic materials that are non-allergenic and do not migrate should be used [7].

Deflux® consists of dextranomer microspheres in a gel of stabilized non-animal hyaluronic acid. The micro-particles have a size of 80-250 µm and therefore do not migrate into surrounding tissue or organs. The success rate VUR depend on many factors grade of vur associated bladder dysfunction whether primary of secondary vur. Present study report success rate of 80% which is comparable to the data from the current literature [8-9,12, 13]. Kirsch et al. were able to obtain a 72% success rate; Puri et al. reported a success rate of 86% [10, 11].

The limitations of our study include that the data collected in the charts may be biased. Cost factor remains main issue compare to open surgery limiting his use in present set up.

#### Conclusion:

The endoscopic treatment of VUR with Deflux is a feasible outpatient procedure, requires minimal operating room time and causes low morbidity. It demonstrated a cure rate of approximately 80% of patients. The use of dextranomer/hyaluronic acid copolymer produces an adequate support of the posterior ureter and promotes resolution of VUR. Further experience with the material and increased use of intraureteral injection may improve our cure rates.

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