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 hospital stay, absence of complications and the high success rate.

Materials and Methods
Between 2014 and 2017, 40 children underwent endoscopic subureteric 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) at the time of injection. The success rates with regard to the grade of reflux are depicted in Table 1.

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 performed for high-grade reflux. Median age was 6-months to 14.9-years. 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 and parental preference.

Results
No intra- or postoperative complications had been noticed. In 32 ureters (80%), postoperative MCU showed no reflux. The success rates with regard to the grade of reflux are depicted in Table 1. No of 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.

Keywords: Vesicoureteral reflux, Deflux

### Table 1

<table>
<thead>
<tr>
<th>No of patient</th>
<th>Downgrading of reflux</th>
<th>Disappearance of reflux</th>
<th>Persistence of reflux</th>
<th>Disappearance after 2nd inj</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>2</td>
<td>32</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>percentage</td>
<td>5%</td>
<td>80%</td>
<td>15%</td>
<td>5%</td>
</tr>
</tbody>
</table>

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%.

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

REFERENCES