

Outcomes of Deflux[®] treatment for vesicoureteral reflux following pediatric transplant: a systematic review

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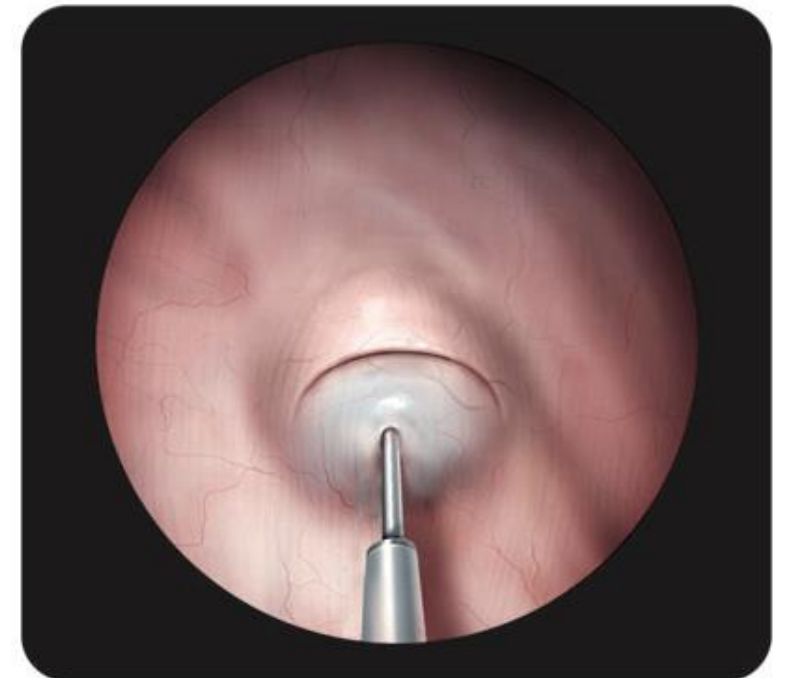
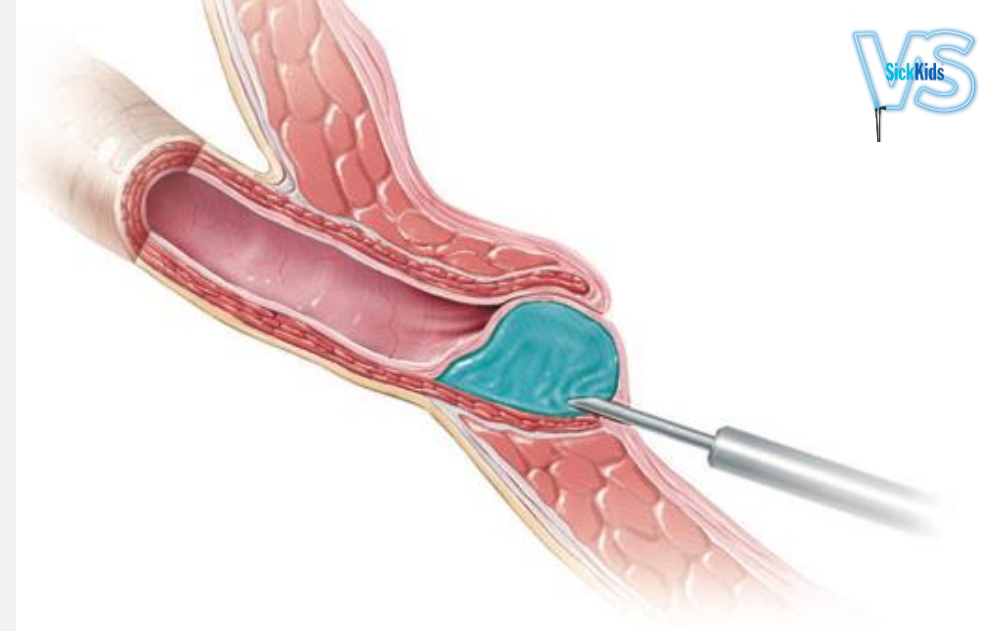


Introduction

- Post-transplant vesicoureteral reflux (VUR) in pediatric population as high as 58%¹
 - May be associated with urinary tract infection (UTI), chronic renal insufficiency, and allograft loss
- Correction of transplant VUR beneficial to patient and may prolong graft survival

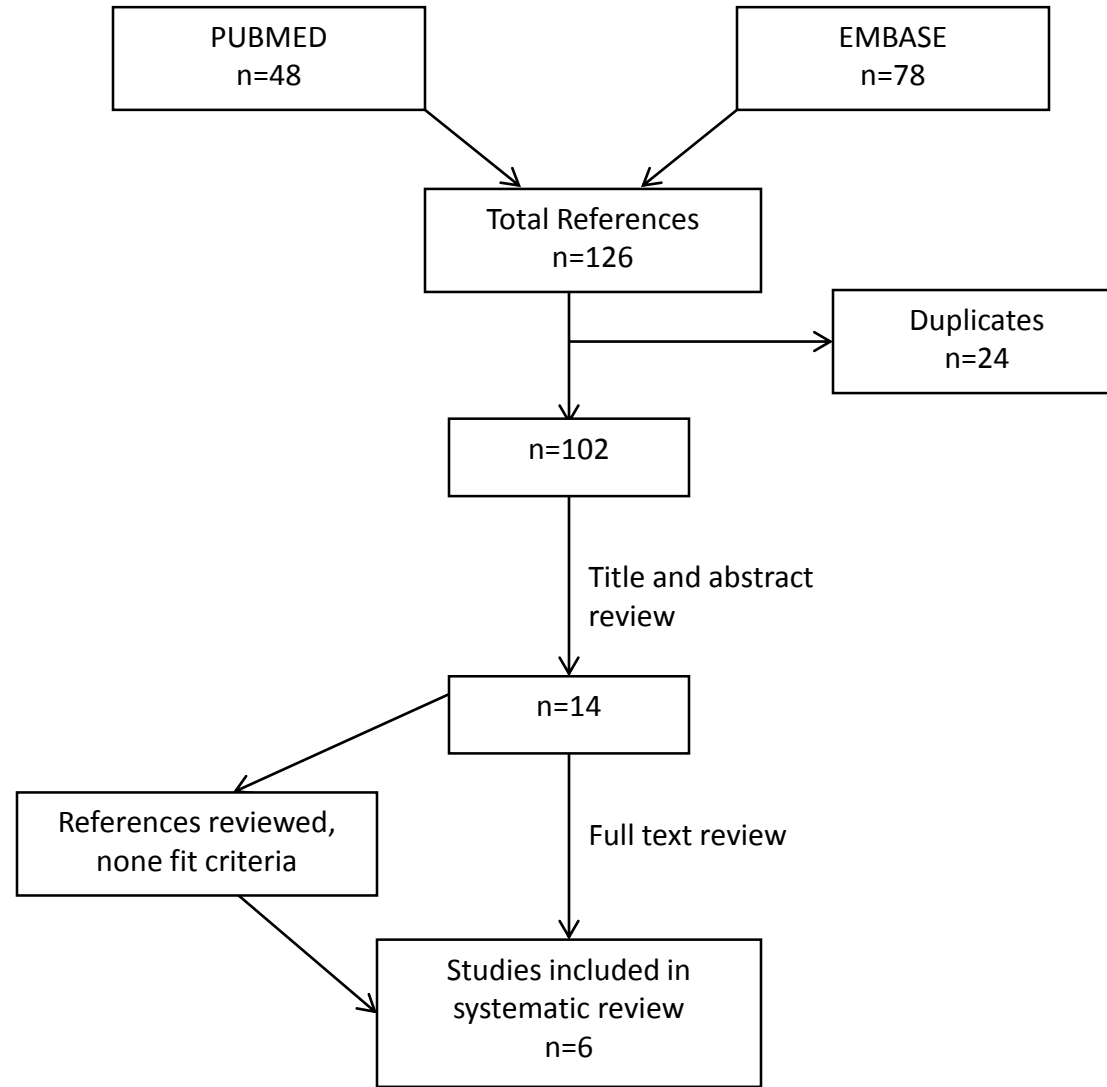
Deflux[®]

- October 2001: US FDA approved Dextranomer/Hyaluronic acid (Deflux[®]) for endoscopic therapy
- Has since been used widely for VUR management



Methods

- Pubmed/Medline and Embase databases were searched from the FDA approval date of Deflux[®] in 2001- April 2019
- Inclusion criteria
 - Full-text English articles
 - Patients less than 18 years old at the time of transplant
 - Diagnosis of VUR post-transplantation
 - Underwent Deflux[®] treatment



Results

- 6 eligible studies, total of 67 pediatric patients with post-transplant VUR treated with Deflux®
- Average success rate is **36.8%**
- **7/67 (10.4%)** developed ureteral obstruction (two studies)
 - Endoscopic ureteric stenting was the initial management, but was only successful in 1/7 patient (14%)
 - Open ureteral reimplantation was performed in 4/7 cases (57%), while 2/7 were managed expectantly (29%, unknown outcomes)
- **20/67 (29.8%)** patients had persistent VUR with UTI
 - 7 (35%) were managed with instituting prophylactic antibiotics, and 13 (65%) with open reimplant
- Success rates were low for reimplant after failed Deflux (40 to 50%) in comparison to redo reimplantation in transplant ureters without prior injection (70 to 80%)^{2,3}

²Krishnan A, Swana H, Mathias R, et al. Redo uretereocystostomy using an extravesical approach in pediatric renal transplant patients with reflux: a retrospective analysis and description of technique. *J Urol*. 2006;176:1582-1587.

³Barrero R, Fijo J, Fernandez-Hurtado M, et al. Vesicoureteral reflux after kidney transplantation in children. *Pediatr Transplant*. 2007;11:498-503.

Conclusions

- **Low success rates following injection techniques for symptomatic VUR after pediatric renal transplant**
- **Not an insignificant risk of obstruction**
- **Lower rates of success if reimplant is required after failed Deflux[®]**
- **Multi-institutional prospective study with a larger population size (study power) may further elucidate these results**

Study	n	Age (years)	Cause of end-stage renal disease (ESRD)	UNC Technique	Amount injected (mL)	Deflux® Technique	Success Rate	Complication Rate (% Obstruction)
Williams 2008	8	11.6 (7-19)	NR	NR	1-1.5	NR	43.5	0
Vemulakonda 2010	11	8 (3-16)	Upper tract 6/11 Lower tract 3/11 Both 1/11 Unknown 1/11	Lich-Gregoir	0.5-1.5	3.7 French needle is passed through the cystoscope and positioned within the submucosal plane of the transmural portion of the ureter. The Dx/HA is slowly injected	54.5	0
Castagnetti 2014	11	8.3 (1.8–17.9)	Upper tract pathology 6/11 Lower tract pathology: Prune belly syndrome 3/11 Posterior urethral valves 2/11	Extravesical reimplantation	0.6-2	transplant ureteral orifice location required a dye test with i.v. injection of a vital dye in seven cases, but the orifice could be visualized and accessed using a standard pediatric cystoscope in all. Injection sites were selected according to the anatomy of each case	63.6	0
Cambareri 2017*	17	6 -11	Denys-Drash syndrome 1/4, Bilateral multicystic dysplastic kidneys and solitary multicystic dysplastic kidney 2/4 unknown upper tract pathology 1/4	NR	1.6-3	The injection technique was the same for all patients and included STING around the circumference of the ureteral orifice.	NR	23.5
Sheth 2018	11	9.2	Renal inflammatory process, Congenital nephrotic syndrome, Thrombotic cortical necrosis, Cystic disease, Renal dysplasia, Reflux nephropathy, Lower urinary tract, obstruction	Lich-Gregoir , non-refluxing	NR	NR	0	0
Wu 2018	9	6.3 (1.5-16.3)	Glomerulonephritis, nephronophthisis, nephrotic syndrome, bilateral Wilms tumor, unknown (each n = 1), bilateral renal dysplasia, bilateral VUR (each n = 2)	Lich-Gregoir/Polita no Leadbetter	1-6	Injection at both the back wall of the ureter and circumferentially around the ureterovesical anastomosis, using the “Double HIT” technique	22.2	33.3

* Only looked at complications. NR = not reported