Indications and Outcome of Cuff-Nipple Ureteroneocystotomy

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Introduction
Infants and children with obstruction or structural weakness of the uretero-vesical junction (UVJ) may require surgical repair. Re-implantation of a dilated ureter into a small capacity and/or scarred bladder following failed surgery, can represent a major surgical challenge. Herein a report on the outcome of the cuff-nipple method of ureteroneocystotomy in these difficult cases, and this represents additional experience with this previously reported technique (1).

Methods
From 1995 to 2016, 50 megaureters of 33 infants (3-10 months) and 12 abnormal ureters of 10 children (3-7 years old), underwent ureteroneocystotomy using a combination of a short submucosal tunneling and cuff-nipple method. The primary indications were repeated breakthrough pyelonephritis while on prophylaxis and/or worsening hydroureteronephrosis. The clinical abnormalities were: obstructed megaureters (21 megaureters/17 infants), reflux megaureters (29/16), and repeat surgery in 12 ureters of 10 children (6/5 failed reimplantation, 4/4 post renal transplantation, 2/1 bladder extrophy). Radionuclide renal scans showed reflux nephropathy in 23/37 infants, while on prophylaxis and/or worsening hydronephrosis. Repeat surgery in 12 ureters of 10 cases, reflux nephropathy in 23/37 infants.

Results
Follow up ranged between 6 months and 12 years. Post-operative VCUG (3-6 mos.) showed no evidence of VUR in 55/60 ureters (91.6%). US at 3, 6, and 12 months indicated improved or unchanged upper tract dilation in 51/60 (85%) kidneys, however, 7/43 (16%) developed recurrent bacteriuria.

Conclusions
The time-tested Paquin (2) dogma of tunnel/width ratio of 5:1 was challenged by Lyons et al. (3). Their contention was that the shape of the ureteral orifice (UO) is more important than tunnel length for correction of VUR. Recently Villanueva et al. (4) performed a parametric simulation study of ureteral collapse (LS-DYNA finite-element software). The changes in the pressure required to collapse the ureter were evaluated with each variable (tunnel length, ureteral diameter, and ureteral thickness/stiffness). Their studies showed that the pressure required to collapse the ureter was inversely related to the diameter of ureter and a 1 cm tunnel length would allow the ureter to collapse under a lower pressure. They proposed the creation of a better UO, which the cuff nipple does, would contribute to an efficient ureteral collapse, i.e. reflux prevention. These observations would explain the high success rate which was achieved by the reported cuff-nipple technique.

References