

"Novel technique of open transvesical excision of obstructive ureterovesical junction and direct ureteric re-implantation"

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Introduction

Primary obstructive megaureter (POM) surgical management varies depend on age of during intervention. Surgical options for a patient below 1 year old of age varies from endo-ureterectomy, cutaneous ureterostomy and refluxing ureteral reimplantation [1]. We are reporting a successful modified ureteral orthotopic reimplantation which proposed by Wei Liu for our 2 month patient with unilateral POM and contralateral non-functioning multicystic kidney disease.

Case report

The child was born term at 39 weeks of gestation after an uneventful pregnancy, apart from a history of varicella zoster infection in week 11 of pregnancy. In view of this, a detailed antenatal scan was performed at 19 weeks of gestation which showed normal findings. However, at D4 of life the child was admitted to SCN with neonatal jaundice. During this period, the infant developed worsening respiratory distress, acidosis and oedema with minimal urine output. Biochemistry revealed rising urea, hyperkalemia and hyponatraemia. Chest and abdominal X-rays were unremarkable. Ultrasound performed revealed small echogenic right kidney with multiple non-communicating cysts suggestive of multicystic dysplastic kidney and a left kidney with moderate hydronephrosis and hydroureter till ureterovesical junction. Micturating cystourethrogram show no reflux and no signs of posterior urethral valve. Initial serum creatinine was 374. The infant was electively intubated for peritoneal catheter insertion and dialysis.

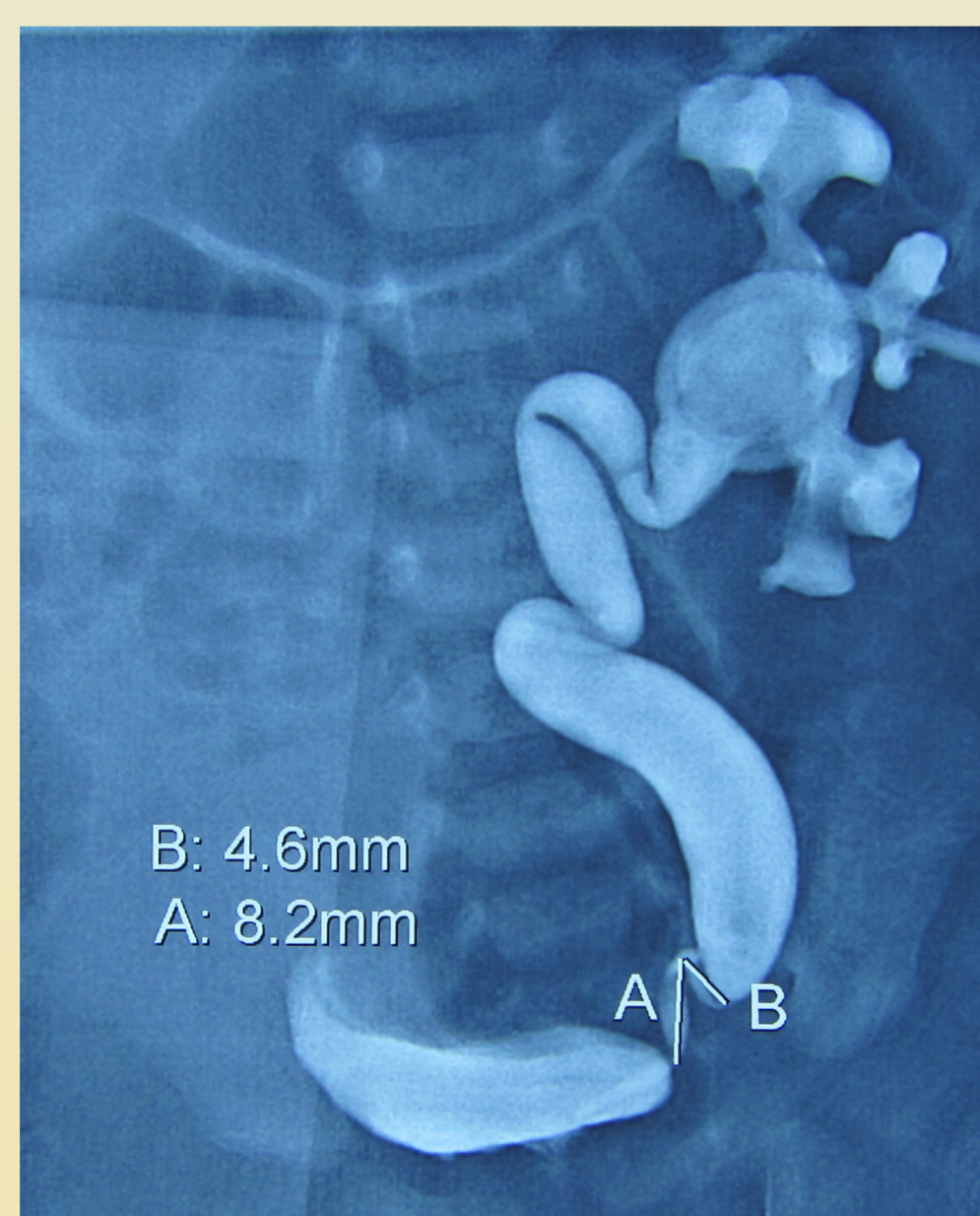


FIG.1. Left antegrade pyelogram : tight short segment stricture at the distal ureter about 1.3cm from the left VUJ.



FIG. 3. Ultrasound image of neoureteric orifice post operation

Peritoneal dialysis was performed for 5 days. Left Nephrostomy insertion by interventional radiologist was performed using size 7Fr Pigtail catheter, anchored at 10cm with good output and improvement of renal function. Creatinine improved from 353 prior nephrostomy insertion to 55 post insertion. Left Anterograde Pyelogram shows tortuous left ureter with a tight short segment stricture at the distal ureter, about 1.3cm from left vesicoureteric junction.

A decision was made for open left ureteric reimplantation. Left modified ureteral orthotopic reimplantation done after patient was stable. Open transvesical approach was used to dissect the left ureterovesical junction. A 4.5 cm of narrow distal ureter till dilated segment was transected. The distal ureter was anchored directly into the bladder protruding 0.5 cm into the bladder. Terminal ureteral mucosa turned outside to create the neoureteric orifice. There was no dissection of trigone and no dissection for submucosal tunnel, to avoid any damage to neurovasculature. Bladder was closed in layers, with suprapubic catheter in situ. Post operation, bladder irrigation was performed for 5 days to prevent clot retention. Nephrostomy was removed at day 6 post operation and suprapubic catheter removed at day 7 post operation. Review at 6 weeks after operation showed completely resolved hydronephrosis on ultrasound and creatinine level reduced to 24. MAG 3 done 3 month post operation show no obstruction at left ureter.

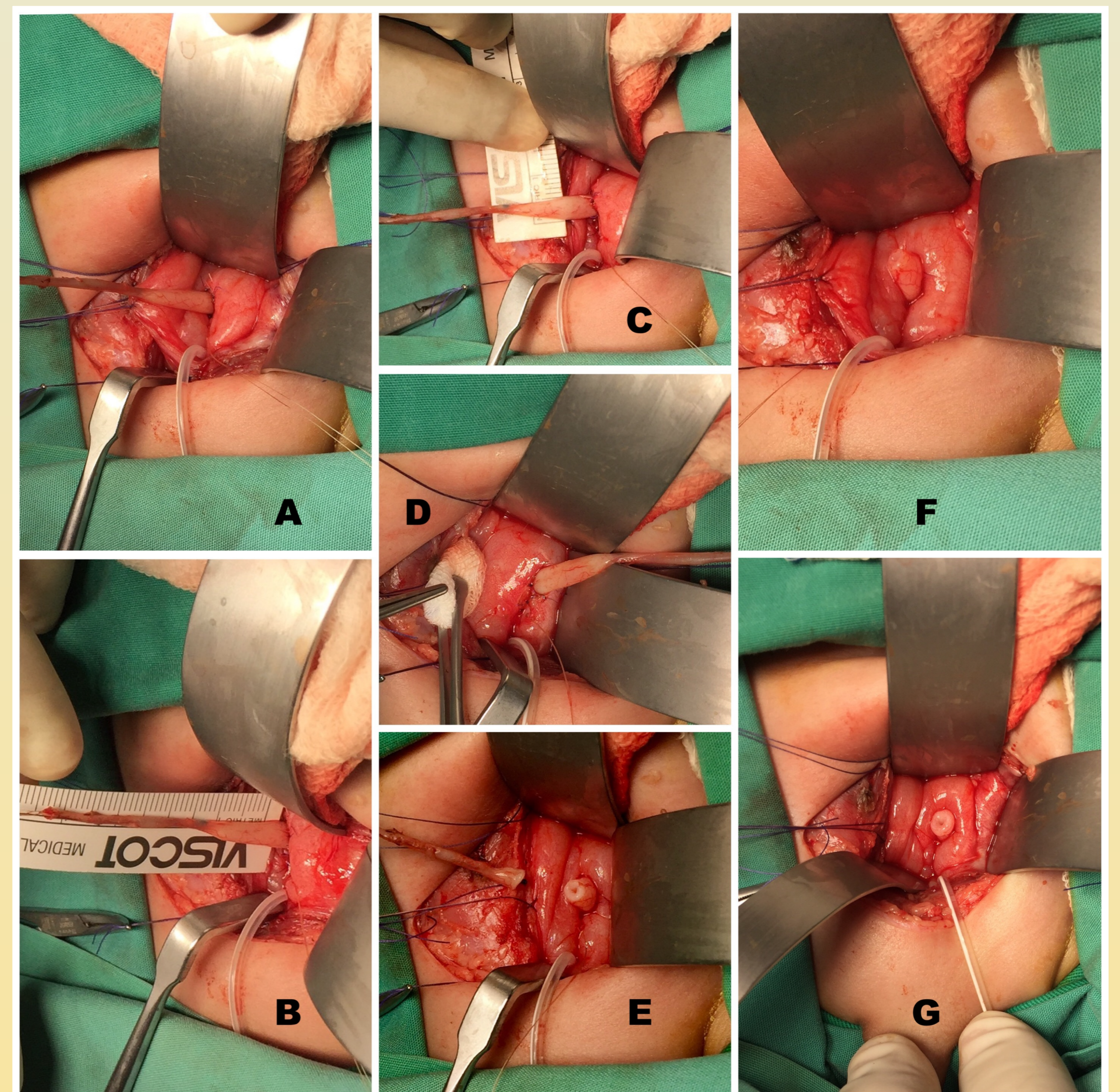


FIG.2. Surgical procedure (A) Open tranvesical approach, the distal narrow with dilated proximal segment of ureter were dissected out, (B) Diluted ureter diameter was measured, (C) Narrow and dilated ureter measured, (D) Dilated ureter segment anchored at seromuscular layer to bladder and part detrusor muscle, reimplantation at original position.(E) Distal narrow segment of ureter was excised, (F) Ureteral length preserved, (D) Terminal ureteral mucosa turned outside to create neoureteric orifice.

Discussion

Primary Obstructive Megaureter is a congenital dilatation of ureter which not associated with vesico-ureteric reflux, bladder outlet obstruction nor other structural anomaly [2]. Based on latest British Association of Paediatric Urologists (BAPU) consensus, congenital megaureters may managed conservatively by insertion of JJ stent or a refluxing reimplantation for those indicated [1]. This patient developed renal failure at early age due to contralateral non-functioning kidney. It has been reported about 2 % patient of multicystic dysplastic kidney disease has a contralateral megaureter [3]. Early peritoneal dialysis and nephrostomy helped to stabilize the affected kidney from irreversible damage.

Surgical options for a patient below 1 year old of age varies from endo-ureterectomy, cutaneous ureterostomy and refluxing ureteral reimplantation [1]. Classical ureteric reimplantation can be very challenging due to the discrepancy between grossly dilated ureter and small bladder. Lee proposed refluxing reimplantation to avoid potential difficult reimplantation [4]. Mini reimplantation is one type of refluxing reimplantation described by Babu which is an intravesical approach, repairing the detrusor muscle behind ureter and placing the ureteric orifice at native position without tapering [5]. The bladder mucosa is closed cranial to the ureteric opening which creates sandwich tunnel between mucosa and detrusor muscle. Mini reimplantation provides modest tunnel length of twice the ureter diameter [5].

Modified ureteral orthotopic reimplantation method is proposed by Wei Liu et al as another method of refluxing reimplantation. Treatment consists of transecting the ureter proximal to the obstruction and performing orthotopic reimplantation, with distal ureter freely protruding into the bladder. The ratio between dilated ureteral diameter and length of protruding ureter is 1:1.5-2 [6]. Range of the patient's age was 1-7 months. We did the operation when the patient was at 2 month 10 days of life. We consider the reimplantation at this age due to renal failure. Recent evidence also showed that direct reimplantation in infant under 1 year of age is safe comparable with reimplantation over 1 year of age [7]

Post operatively, patient developed transient hematuria treated by bladder irrigation. Subsequently bladder function improved and ultrasound show reducing hydro ureter and hydro nephrosis. Children with POM may have higher risk of bladder dysfunction because of global urinary tract dysplasia and maldevelopment [7]. We will follow up this patient till patient achieved toilet training.

Conclusion Open intravesical orthotopic direct re-implantation in the infancy is a good option.

References

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