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Operative Techniques

Dismembered extravesical reimplantation of dilated upper pole ectopic ureters in duplex systems

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Abstract

Purpose: We report the results in patients with obstructed upper pole ectopic ureters in duplex systems undergoing dismembered extravesical reimplantation of the upper pole ureter alone.

Methods: Between 01/2007 and 03/2012, 11 patients with an upper pole ectopic ureter (1 bilateral) diagnosed following the antenatal detection of hydronephrosis and showing preserved function on renal scintigraphy in a dilated upper moiety, underwent a dismembered reimplantation of the ectopic upper pole ureter as follows. The ureter was identified, separated from the lower pole ureter, and divided just above the bladder. The distal stump was suture closed, while the proximal segment was mobilized, tapered as necessary, and reimplanted using an extravesical technique.

Results: Twelve ectopic ureters were reimplanted. Median (range) patient age at surgery was 8 (3–48) months. Ureteral tapering was performed in 11 ureters, by infolding in 9 and using an excisional tailoring in the single case undergoing bilateral reimplantation. After a median (range) follow-up of 17 (6–50) months, all patients were asymptomatic. Eleven reimplanted ureters showed improving hydroureteronephrosis, no obstruction on diuretic scintigraphy, and no evidence of reflux on indirect radionuclide cystography. One reimplanted ureter developed worsening hydroureteronephrosis after excisional tailoring of the ureter and partial nephrectomy was performed.

Conclusions: Extravesical reimplantation of the upper pole ureter is an option in dilated upper pole ectopic ureters with good function. Separating the upper and lower pole ureters proximally to the bladder does not jeopardize the ureteral blood supply and allows leaving the lower pole ureter undisturbed. Excisional ureteral tailoring should be avoided.

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Ureteral ectopia is a rare condition. Most commonly it concerns the upper pole ureter of a duplex system. Upper pole partial nephrectomy is the most common approach for upper pole ectopic ureters, based on the assumption that the upper pole is often dysplastic and poorly functioning [1,2]. Nevertheless, some upper poles are big on ultrasound scan (US) and show reasonable function on renal scintigraphy thereby making reconstructive surgery appealing [1–5]. Under these circumstances, treatment options include diversion of the

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upper into the lower moiety or ureteral reimplantation [1–5]. When reimplantation is elected, in contrast with the experience with primary reflux [6], an intravesical reimplantation is generally recommended. Moreover, both ipsilateral ureters are usually reimplanted en-bloc based on the assumption that they share a common vascular supply. To our knowledge, a dismembered extravesical reimplantation of upper pole ureters has so far been reported only in a small series of patients with duplex system ureteroceles [7].

We report our experience in a series of patients with a dilated upper pole ectopic ureter undergoing a dismembered extravesical reimplantation of the upper pole ureter after its division and mobilization proximally to the bladder.

1. Patients and methods

We retrospectively reviewed the charts of 18 patients (12 females) treated at our institution between January 2007 and March 2012 for a duplex system associated with obstructive hydroureteronephrosis of an ectopic upper moiety.

All these patients were started on prophylactic antibiotics at presentation pending a preoperative work-up that included US, micturating cystourethrography (MCUG) and (99 m)Tc-mercaptoacetyltriglycine (MAG3) scintigraphy.

Upper pole partial nephrectomy was elected in cases with poor upper pole function on the MAG3 scintigraphy, whereas dismembered extravesical reimplantation of the upper pole ureter alone was performed in those with good upper pole function and a dilated ureter (Fig. 1).

The procedure started with an endoscopy to confirm the diagnosis, determine the location of the ectopic ureter, if possible, and stenting the ureter in order to make subsequent dissection easier. A 4 or 5 Fr ureteral stent was used, according to the size of the ureteral orifice, and was inserted into the ectopic ureter whenever this could be visualized and in the lower pole ureter otherwise. The bladder space was approached via a Pfannenstiel incision, and the ureters on the affected side identified using the umbilical artery as landmark (Fig. 2A, B). The upper pole ureter was sectioned just above the bladder and the distal stump going behind the bladder suture closed and abandoned. The upper pole ureter was dissected proximally in order to straighten the ureter and this always allowed gaining enough length for reimplantation (Fig. 2C). The ureter was tapered over a 12 Fr feeding tube using either an infolding (Starr plication) or excisional tapering (Hendren tailoring), if necessary, and reimplanted using an extravesical technique.

Postoperatively, a 6 Fr ureteral catheter was left indwelling in the reimplanted ureter, whereas a trans-urethral Foley catheter was used for bladder drainage. Both tubes were removed 5 days after surgery.

Antibiotic prophylaxis was administered for 1 month. All patients underwent a bladder and renal US at 2 and 6 months postoperatively, a MAG3 scintigraphy at 6 months, and annual bladder and renal follow-up US thereafter. Additional investigations were performed only in case of symptoms.

Postoperative outcome parameters considered for this study included febrile urinary tract infections (UTI), worsening or lack of improvement in upper tract dilatation, persistent obstruction on MAG3 scintigraphy, detection of reflux on indirect radionuclide cystography [8] during the MAG3 study, worsening drainage in the lower pole, and the need for additional surgical procedures.

2. Results

During the study period, 11 patients underwent the described ureteral reimplantation including 1 bilateral case.

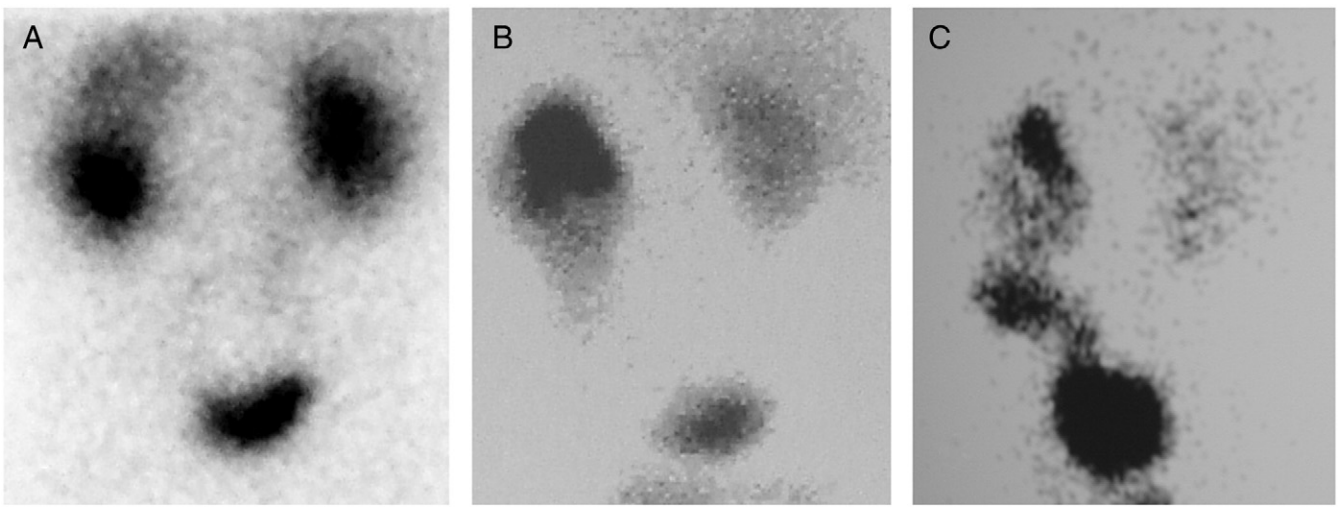

Fig. 1 Example of good functioning upper moiety. (A) A big upper pole is visualized in early images (1–2 min) after injection of the radiopharmaceutical. (B) The radiopharmaceutical concentrates into the dilated pelvis. (C) Delayed images showing passage of the radiopharmaceutical into a dilated and tortuous ureter.

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