Acta Med. Okayama, 2011
Vol. 65, No. 5, pp. 343-345

Acta Medica Okayama
http://escholarship.lib.okayama-u.ac.jp/amo/

Case Report

Retroperitoneoscopic Nephrectomy for Treatment of a Case of Left Single Ectopic Ureter Accompanied by Dysplastic Kidney

Ryoei Hara*, Tomohiro Fujii, Yoshimasa Jo, Teruhiko Yokoyama, Yoshiyuki Miyaji, and Atsushi Nagai

Department of Urology, Kawasaki Medical School, Kurashiki, Okayama 701-0192, Japan

We report the case of a 7-year-old girl with a single ectopic ureter who was treated with retroperitoneoscopic nephrectomy for a chief complaint of urinary incontinence. Preoperative CT showed a contrasted dysplastic kidney of 1 cm in the renal fossa and a left ureteral opening into the vagina. Retroperitoneoscopic left nephrectomy was conducted with opening of the lateroconal fascia to enable identification of the dysplastic kidney. No intraoperative complications were encountered. Urinary incontinence improved immediately after surgery. This case shows that a retroperitoneal approach can be used in nephrectomy if the position of the kidney can be determined preoperatively.

Key words: dysplastic kidney, nephrectomy, retroperitoneal approach, single ectopic ureter, urinary incontinence

Urinary incontinence due to a single ectopic ureter is a relatively rare condition and is, in most cases, accompanied by a dysplastic kidney. In recent years, the value of laparoscopic nephrectomy for permanent cure of this disease has been reported [1]. The safety of retroperitoneoscopic nephrectomy in children has been established [2], but problems with the working space and characteristics of the disease may restrict application of this technique for urinary incontinence [3]. We experienced a case of a left single ectopic ureter accompanied by a dysplastic kidney that we treated successfully with retroperitoneoscopic nephrectomy.

Received April 15, 2011; accepted June 10, 2011.
*Corresponding author. Phone: +81-86-462-1111; Fax: +81-86-462-1199
E-mail: ryoeih@med.kawasaki-m.ac.jp (R. Hara)

Case Report

The patient was a 7-year-old girl who visited the urology department of a nearby hospital for a chief complaint of urinary incontinence that had continued after toilet training. She had no particularly relevant medical or family history. The patient was diagnosed with a left ectopic ureteral opening into the vagina based on an abdominal pelvic contrast CT scan, and was referred to our department in late September 2009. CT imaging showed a contrasted dysplastic kidney of 1 cm in the renal fossa (Fig. 1A). A left ureteral opening into the vagina and pooling of contrast media in the vagina were found in delayed-phase CT (Fig. 1B). The case was diagnosed as a left single ectopic ureter accompanied by dysplastic kidney.

Retroperitoneoscopic left nephrectomy was conducted under systemic anesthesia. One 12-mm port and two 5-mm ports were used. Opening the lateroconal fascia enabled identification of the dysplastic

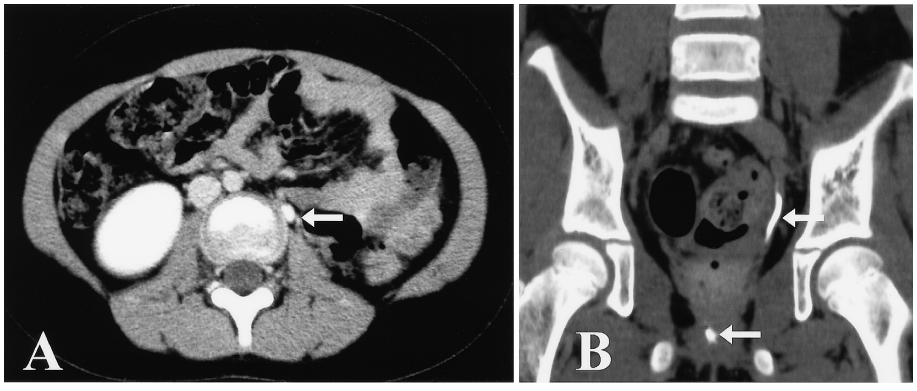

Fig. 1 A, Enhanced CT showing a small left kidney located close to the vertebrae; B, In the delayed phase, CT showed an ectopic ureter and the presence of contrast medium in the vagina.

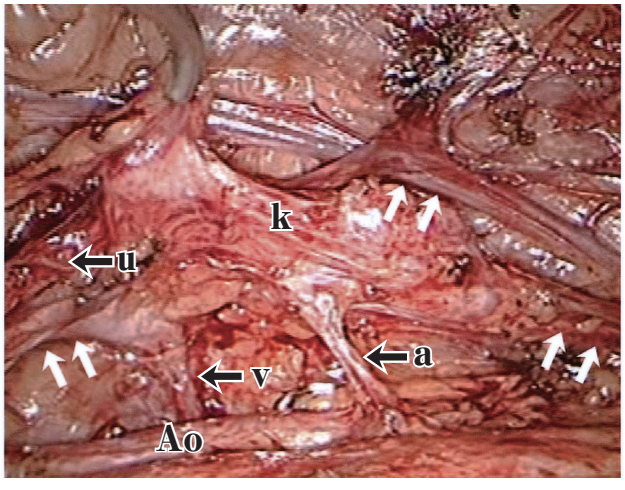

Fig. 2 Intraoperative view. a, renal artery; v, renal vein; u, ureter; k, dysplastic kidney; Ao, aorta and white arrow: well-developed blood vessel system.

kidney and the normal ureter. The perinephric adipose tissue was removed to leave only the ureter and surrounding blood vessel system, which revealed the renal artery and vein and a well-developed blood vascular system (Fig. 2). These blood vessels were treated with a vessel-sealing system, and the ureter was separated at as low a position as possible to reach the crossover point of the common iliac artery. The ureter was clipped and then cut after indigo carmine was intravenously infused and no leakage was confirmed. The renal unit was collected through the 12-mm port. No drain was left in place. The operation time was 80 min with little bleeding. No intraoperative complications were encountered. Histopathological evaluation showed that the glomerulus was relatively normal and a renal tubule structure was present in the upper kidney. These features were not generally observed in the lower kidney, and a dysplastic duct was present, which led to a diagnosis of renal dysplasia. Urinary incontinence improved immediately after surgery, and the patient was discharged on postoperative day 4.

Discussion

Single ectopic ureters, especially those connecting the renal pelvis to the vagina or vestibular portion (Thom Type Ⅰ), are most commonly found in cases of ectopic ureter in Japan [4, 5]. In contrast, an ectopic ureter starting from the upper pole of the duplicated renal pelvis (Thom type Ⅲ) is most frequently found in Europe and the US, indicating a racial difference [6]. In a study of 36 cases of ectopic ureter in Japan, Gotoh *et al.* [5] found that 25 (69%) involved a single ectopic ureter and 11 (31%) had a duplicated ectopic ureter. In addition, 10 (40%) of the 25 cases of single ectopic ureter had an opening into the vagina, including 6 (60%) that originated from the pelvic kidney. All 10 cases had a dysplastic kidney, with histological determination of renal dysplasia but no ureter abnormality.

A single ectopic ureter with a chief complaint of urinary incontinence is accompanied by a dysplastic kidney or abnormal placement of the kidney in most cases. Nephrectomy is commonly carried out as a permanent cure, and laparoscopic surgery has been introduced into this procedure in recent years [1, 3].

In a study of transperitoneal laparoscopic nephrectomy in 16 young female patients with a single ectopic ureteral opening, Jeong *et al.* [1] found that the average size of the resected kidney was 2.8 cm in diameter, the average operation time was 109 min and the average hospitalization period was 2.6 days, since no serious intraoperative complications occurred, except for one case of small bowel injury during insertion of a port. An abnormal position of the kidney was found in 11 cases (69%), and no kidney was identified in preoperative imaging in 3 cases (19%). The study also indicated the safety and effectiveness of a transperitoneal approach, especially with regard to ease of kidney identification, compared with a retroperitoneal approach [1].

There has been no extensive clinical study of a retroperitoneal approach carried out at a single institution, and only a few case reports are available, possibly because a single ectopic ureter is a relatively rare condition and because many institutions prefer a transperitoneal approach [3]. It seems to be difficult to detect dysplastic kidney in an abnormal position by a retroperitoneal approach if the position cannot be determined preoperatively. However, CT/MRI can now be used to detect a dysplastic kidney, and further improvement of diagnosis is likely using B-mode and/or color Doppler ultrasound [1, 7]. A retroperitoneal approach is also technically difficult since the retroperitoneal cavity may be too small to conduct surgery in children. However, in a retrospective study of 51 articles on transperitoneal and retroperitoneal approaches in 689 children who underwent nephrectomy, Kim *et al.* [2] found no differences in operation time, complications, or period of hospitalization between the 2 approaches, and indicated that the operation time tended to be shorter using a retroperitoneal approach.

Borzi *et al.* found similar results in a study of nephrectomy in 186 children in a single institution [8], which suggests a retroperitoneal approach with isolated renal excision without extended ureterectomy. We also suggest that a retroperitoneal approach should also be considered if the position of the kidney can be determined preoperatively, as in our case. No infection in the remaining urinary duct has been reported in a case of single ectopic ureter [9]. Thus, in cases with a chief complaint of urinary incontinence only, as for our patient, a retroperitoneal approach is likely to be appropriate for common nephrectomy.

In nephrectomy for treatment of a single ectopic ureter for permanent cure of urinary incontinence, intraoperative identification of the kidney is likely to be relatively easy if a dysplastic kidney can be detected preoperatively from the cranial side according to the bifurcation level. Therefore, a retroperitoneal approach, which is the least invasive for other organs, should be considered first in such cases.

References

1. Jeong BC, Lim DJ, Lee SC, Choi H and Kim HH: Laparoscopic nephrectomy for a single-system ectopic ureter draining a small, dysplastic and poorly functioning kidney in children. Int J Urol (2007) 14: 104–107.
2. Kim C, McKay K and Docimo SG: Laparoscopic nephrectomy in children: systematic review of transperitoneal and retroperitoneal approaches. Urology (2009) 73: 280–284.
3. Nishiyama T and Terunuma M: Laparoscopic retroperitoneal nephrectomy for atrophic kidney associated with ectopic ureter in a 2-year-old girl. Int J Urol (1996) 3: 307–309.
4. Mori Y, Takiuchi H, Nojima M, Kondoh N, Yoshimoto T, Maeda N, Kurachi M and Shima H: Ectopic ureter in 54 children. Nippon Hinyokika Gakkai Zasshi (2001) 92: 470–473 (in Japanese).
5. Gotoh T: On renal function and structure in ureterovesical junction anomalies with particular reference to the genesis of renal dysplasia. Nippon Hinyokika Gakkai Zasshi (1983) 74: 1493–1508 (in Japanese).
6. Malek RS, Kelalis PP, Stickler GB and Burke EC: Observations on ureteral ectopy in children. J Urol (1972) 107: 308–313.
7. Li J, Hu T, Wang M, Jiang X, Chen S and Huang L: Single ureteral ectopia with congenital renal dysplasia. J Urol (2003) 170: 558–559.
8. Borzi PA and Yeung CK: Selective approach for transperitoneal and extraperitoneal endoscopic nephrectomy in children. J Urol (2004) 171: 814–816.
9. Plaire JC, Pope JC 4th, Kropp BP, Adams MC, Keating MA, Rink RC and Casale AJ: Management of ectopic ureters: experience with the upper tract approach. J Urol (1997) 158: 1245–1247.