

Case Report

Laparoscopic Upper Pole Partial Nephrectomy with Ureterectomy in Duplicated Collecting System

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ABSTRACT

Duplicated collecting system is a relatively common congenital abnormality of the genitourinary tract with an incidence of 0.8%. This abnormality is frequently associated with an obstructed and poorly functioning upper pole moiety. Most of the patients are asymptomatic and diagnosed incidentally. The diagnosis and optimal management of

duplicated collecting systems are difficult due to high anatomical variability, the degree of obstruction and chronic damage. The clinical presentations are flank pain, hematuria and urolithiasis and may be complicated by urinary tract infections. Surgery is the main treatment for symptomatic patients.

KEY WORDS: duplex kidney, duplicated renal collecting system, upper pole nephrectomy

INTRODUCTION

Ureteral duplication is a rare congenital abnormality and is found in 0.9% of autopsy series^[1]. A duplex urinary system means that a kidney has two pelvicaliceal regions and each of them has a ureter^[2]. These ureters may be partially duplicated or entirely separated representing complete duplication. Partially duplicated systems are frequently associated with an obstructed and poorly functioning upper pole^[3]. Both of these subtypes are the result of premature splitting of the ureteric bud, a remnant of Wolffian duct^[2]. Partial duplication is originated from metanephric tissue that has not separated entirely and these systems have several lobes with overlapping collecting tubules. The clinical presentation of the patients depends on age. Recurrent urinary tract infection is seen in pediatric patients and vesicoureteral reflux, recurrent infections, hematuria and abdominal or flank pain are the clinical signs of adult patients. In partial duplex systems, standard surgical treatment is upper pole heminephrectomy for symptomatic patients^[3]. In this study, we present a case of partial duplex system treated by laparoscopic upper pole heminephrectomy with excision of upper ureter.

CASE REPORT

A 31-year-old woman presented with right flank pain for a few years. The medical history of the patient was unremarkable. Ultrasonography revealed cystic mass in upper pole of the right kidney suggesting duplicated urinary system. Computed tomography showed right partial duplicated system with hydronephrotic upper pole (Fig 1). Diagnostic ureterorenoscopy confirmed the duplicated system. Retrograde pyelography showed the duplicated system (Fig 2). The double J stent was inserted into the lower pole. The patient was repositioned in the flank position. Peritoneal access was obtained via open techniques near the umbilicus. After the insertion of camera port, two 5-mm ports were placed. At the operation, the ureter was transected from the advent tissue. The ectopic ureter was traced above and below the renal hilum and isolated from the healthy one after the ureter was cut on bifid location and sutured with 4.0 absorbable vicryl suture. The renal hilum was approached, upper pole was identified and the upper pole excised with Harmonic scalpel (Fig 3a and 3b). The specimen of ureter with upper pole is seen in Fig 4. Six weeks after the surgery, the double J stent was

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Fig. 1: Computed tomography images of the patient



Fig. 2: Retrograde pyelography showed the lower and upper pole and double J stent was inserted into the lower pole

taken under local anesthesia. Intravenous urography demonstrated the final position of the urinary system after three months after the surgery (Fig 5).

DISCUSSION

Duplicated collecting system is a common congenital urological abnormality and is characterized by incomplete fusion of lower and upper pole moieties that results in incomplete or complete duplication^[4]. The incidence of unilateral duplication is approximately 0.8% in United States. Incomplete duplication is seen three times more often than complete duplications^[4]. The investigators believed that this abnormality was autosomal dominant and has the highest prevalence in Caucasian females^[3].

The clinical presentation of patients is variable and highly dependent on age^[4]. In children, the most common clinical symptom is recurrent urinary tract infection. Vesicoureteral reflux and flank pain are usually seen in both children and adults. The

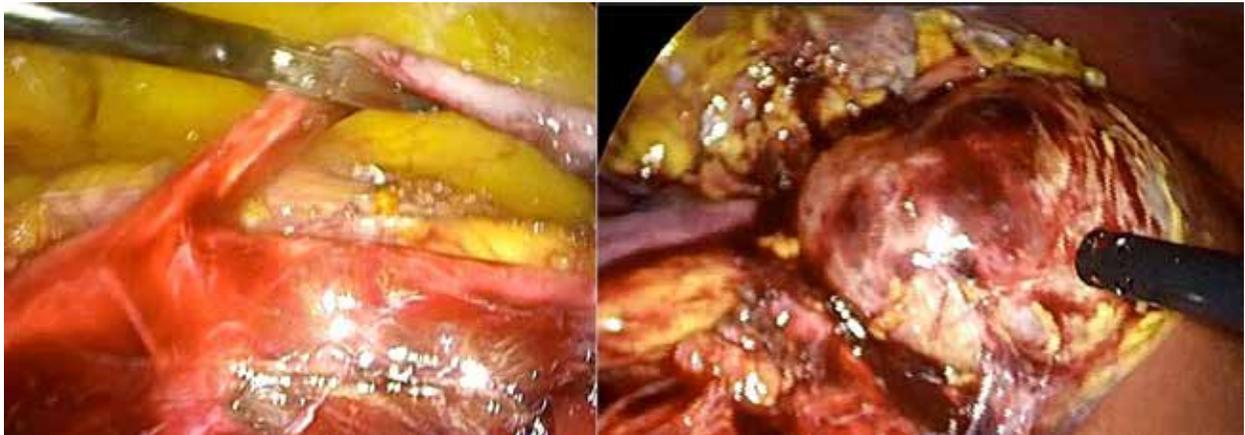


Fig. 3a: The double ureter and upper pole images at laparoscopy



Fig. 3b: After excision of the upper pole with ureter

other symptoms are hematuria and stone formation, especially in adults. Urinary incontinence and ureterocele are rarely seen when there is complete duplication and ectopic ureter is implanted into the urethra or vagina. In this study, the patient presented with flank pain for a few years.

Kidney morphology, function and ureter status should be imaged by radiological techniques^[4]. Intravenous urography and spiral computed tomography urography are other imaging modalities. Magnetic resonance urography is a good alternative method for children without ionizing radiation. Voiding cystourethrogram may show lower pole reflux^[2]. In this study, the patient was diagnosed using spiral computed tomography.

The first reported case of laparoscopic heminephrectomy was published by Jordan and Winslow in 1993 on a pediatric patient^[5]. Laparoscopic heminephrectomy in duplex kidneys is more difficult than nephrectomy due to the increased risk of haemorrhage, urine leak, and vascular compromise of the remaining renal moiety. In our case, mean surgical time was 120 minutes. Blood loss was not clinically

significant, and the patient was hospitalized for two days. There was no injury to the lower pole ureter and the vascular pedicle. Additionally, no intra-operative or post-operative complication occurred.

CONCLUSION

In symptomatic patients, surgical treatment can be performed by open, laparoscopic and robotic approaches. Laparoscopy provides an excellent overview of the anatomical structures, with magnification allowing exact pole ablation along the anatomical border when compared to open techniques. Low postoperative pain, short hospital stay and early return to normal daily activities are the advantages of laparoscopic operations. Laparoscopy performed by experienced surgeons is a safe and effective method for patients with duplicated collecting system.



Fig. 5: Image of the intravenous urography after surgery



Fig. 4: The specimen of the upper pole with ureter

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