Case Report

Complete Ureteral Duplication Associated with Ectopic Ureteral Orifice Opening to Prostatic Urethra: A Case Report

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Abstract

Ectopic ureter is one of the rarely encountered abnormalities of the urinary system resulting from the abnormal relation of the mesonephric canal and ureteric bud during embryonic development. Ectopic ureter, which is more commonly seen in women and associated with duplex collecting system, is an entity that should be remembered in children with complaints of constant urinary incontinence despite normal urination patterns during childhood. In the diagnosis of this case associated frequently with dysplastic kidney, Magnetic Resonance urography (MRU) is an ideal method. Its treatment differs in accordance with kidney function and the location of ectopic ureteral orifice. By reviewing the literature, the objective of this study was to probe into the case of an ectopic ureter opening to prostatic urethra associated with duplex collecting system determined in a male patient who applied to our clinic with the findings of severe obstruction without urinary incontinence.

INTRODUCTION

Two separate renal pelvis and ureter are present in complete ureteral duplication and can be seen with ectopic ureteral orifice. While the probability of seeing an ectopic ureteral orifice is very slim, the most frequent opening sites are the bladder neck and prostatic urethra in men and bladder neck, urethra, vestibule, and vagina in women [1]. As the obstruction seen in the ureter draining the upper pole is generally symptomatic, surgical treatment can be considered. By reviewing the literature, the objective of this study was to probe into the case of an ectopic ureter opening to prostatic urethra associated with duplex collecting system determined in a 46-year-old male patient who applied to our clinic with the findings of severe obstruction without urinary incontinence.

CASE PRESENTATION

46-year-old male patient applied to our clinic with a right side pain that had been occasionally going on for approximately ten years but had increased in the last three months. In the urinary ultrasonography performed on the patient whose kidney function tests, urinalysis, and physical examination were normal, it was confirmed that the right ureter was dilated at full length and that it showed severe tortuosity. In intravenous pyelogram (IVP) performed upon these findings, both ureters were monitored to be normal. Since the findings of ultrasonography and IVP contradicted, it was observed in the abdominal computed tomography (CT) performed to have a more detailed image that there was a duplex collecting system in the right kidney, and the upper pole of the kidney showed grade 4 hydronephrosis and also the ureter draining the upper pole revealed severe distal dilatation (Figure 1). By planning cystourethroscopy so as to determine the ureter orifices of the patient, perform ureterorenoscopy, if necessary, and anchor double-j catheter, the preoperative preparations were completed. In the cystourethroscopy of the patient, right and left ureteral orifices were found in normal localization within the bladder. However, a second structure appearing to be an ectopic ureteral orifice adjacent to uriculusprostaticus above verumontanum was seen (Figure 2). Urethral catheter was tried to be inserted from here, but the process was not completed successfully. Considering that there might be ectopic opening in the ureter draining the upper pole, MRU and DMSA scintigraphy, with the aim of evaluating kidney functions, were performed on the patient. As a result of MRU, it was visualized that the ureter draining the upper pole ended distally within the prostate parenchyma (Figure 3). In DMSA scintigraphy, the lower pole was normal but the upper pole was determined to have no function. In addition, transrectal
ultrasonography was carried out, the ureter silhouette within the prostate parenchyma was entered by Chiba needle and after seeing that there was fluid flow, 30 cc fluid was aspirated within the dilated ureter and the same amount of contrast agent was injected. Direct urinary system graphy was conducted and a thorough image of the ectopic ureter was obtained (Figure 4,5). Consequently, upper pole heminephrectomy and ureterectomy were decided to be performed on the patient. After completing preoperative preparations, retroperitoneum was reached in right

Figure 1 CT image of the duplex collecting system: lower pole ureter (thin arrow), hydronephrotic upper pole ureter (thick arrow).

Figure 2 Endoscopic image of verumontanum; utriculus prostaticus (thick arrow), suspected ectopic ureter orifice (thin arrow).

Figure 3 MRU image of the duplex collecting system; ending point of the ectopic ureter is visualized.

Figure 4 The ending point of the ectopic ureter within prostate parenchyma and dilated ectopic ureter are visualized in transrectal USG.

Figure 5 In the direct urinary system graphy performed after injecting opaque agent within the transrectal ultrasonography-guided ectopic ureter, ectopic ureter with dilatation and tortuosity is visualized (white arrow).

Figure 6 Highly dilated ureter draining the upper pole of the right kidney and normal size ureter draining the lower pole are visualized together intraoperatively.
flank position. Both ureters from the right kidney were found and isolated separately. In the meantime, the ureter draining the upper pole was visualized to be severely dilated (Figure 6). Upper pole heminephrectomy and ureterectomy were performed on the patient. The pathologic evaluation of the tissues taken from the patient reported that they were compatible with chronic inflammation.

**DISCUSSION**

The prevalence of complete or incomplete ureteral duplications in the urinary system has been stated 0.7% in an autopsy series and between 2 and 4% in clinical series. It is two times more common in women than in men [2]. Incomplete duplication is seen three times more than complete duplication. Ectopic ureter is defined as the abnormal opening of the ureter orifice outside of its normal site in the trigone. This case is more commonly seen in women and is 80% associated with duplex collecting system. The majority is seen in single collecting systems in men [2]. The prevalence of ectopic ureter in society is 0.025%. Approximately 10% of it is bilateral and seen two to twelve times more in women [3].

In embryonic development, the ureters develop in the mesonephric canals on the fourth week of gestation. In duplicated systems, complete ureteral duplication occurs as a result of the induction of metanephric blastema by two separate ureter buds coming out of the mesonephric canals. According to the Weigert-Meyer rule, the ureteral orifice draining the lower pole of the kidney opens more laterally and cranially, whereas the ureteral orifice draining the upper pole of the kidney opens more caudally and medially. Vescicouteral reflux is visualized in the ureter draining the lower pole, and obstruction is visualized in the ureter draining the upper pole.

As well as opening proximate to normal orifices, ectopic ureteral orifices can sometimes open to different localizations. In cases where the ureter cannot fully separate from the mesonephric canal ectopic ureter orifice opens to another structure consisting of the mesonephric canal apart from the urinary system. Most common opening sites of the ectopic ureter are bladder neck and prostatic urethra (%48), seminal vesicles (%40), ejaculatory duct (%8), vas deferens (%3), or epididymis (%0.5) in men and bladder neck and urethra (%35), vestibule (%30), vagina (%25), or uterus (%5) in women [4] 84% of ectopic ureters are diagnosed during childhood [4]. The most important reason for applying to a clinic in cases where the ectopic ureter opens infrasphincterically is constant urinary incontinence with a regular urination pattern [6]. Supraspincteric openings can be asymptomatic. As posterior urethra is the most frequent opening site of ectopic ureter in men, incontinence is rare and diagnosis is made in examinations performed due to obstruction, acute and recurrent epididymitis, persistent urinary tract infections, abdominal and back pain, and infertility [7,8]. Sometimes, symptoms such as urgency, pollakiuria, prostatitis in the sexual activity period, vesiculitis, epididymo-orchitis, hematospermia, painful defecation, and pelvic pain can be reasons of application. The kidney or kidney segment drained by the ectopic ureter is usually hypoplastic or dysplastic. The ureteral orifice is usually narrow and ureter wide. If the kidney segment is highly dysplastic, there may be no incontinence even if the ureter segment is infrasphincteric.

Ultrasoundography is the first diagnostic method to be performed to see the dilated ureter that formed associated with ectopic orifice. In cases where duplex system is suspected, IVP and voiding cystourethrogram (VCUG) should be conducted. However, ectopic ureters which are dysplastic and drain the kidney segment whose function is impaired may not be visualized in IVP [9]. As is in our case, in these cases, MR can demonstrate duplicated collecting system, ectopic ureter, ureterocele, and extravesical insertion point of the ectopic ureter, and delineate malformation completely [1,10]. MRU does not involve radiation and it can be preferred in cases with iodine allergy. It is the ideal diagnostic method widely used today. Together with being a tool that can be used during diagnosis, endoscopic evaluation may not always detect the ectopic ureteral orifice. A study has reported that 58% of the ectopic orifices ending in the vagina, vestibule or bladder neck can be detected by endoscopy [11].

If there is a kidney pole which doesn’t show function and is dysplastic, heminephrectomy is the method of choice. Along with different views on the removal of ureteral stump, a study presented that the necessity of removing the ureteral stump occurred in 12% of the patients who had undergone heminephrectomy and that no case without urinary tract infections but with urinary incontinence underwent ureteral stump removal [11]. If the upper pole is present with good functions, it can be protected by carrying out ureteropyelostomy or ureteroneocystostomy. In our case, the upper pole of the kidney was not functional, and since the patient was symptomatic, heminephrectomy and ureterectomy were performed. Fifteen-month follow-up of the patient, whose complaints improved in the postoperative period, was evaluated normal.

**REFERENCES**
