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Case Report

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Congenital distal ureteral diverticulum as a rare cause of vesicoureteral reflux

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Abstract

Congenital ureteral diverticulum is a rare urinary tract anomaly which usually can be diagnosed incidentally during surgery. Most pediatric cases presented with persistent urinary tract infections and high-grade vesicoureteral reflux (VUR). A 4-year-old boy with incidentally diagnosed intramural distal ureteral diverticulum with grade 5 VUR case was discussed.

Keywords: diverticulum, robotic surgery, ureteral diseases, urinary tract infections, vesico-ureteral reflux, urinary tract infections

1. Introduction

Vesicoureteral reflux (VUR), which is defined as the retrograde flow of urine from the bladder to the ureters due to the failure of the valve mechanism that prevents backflow, has a prevalence ranging from 0.4% to 1.8% in the literature (1). Although the exact causes are unclear, these can be stated as the increased diameter of the intramural ureter, dysfunctional voiding, or congenital malformations (2). Depending on the severity of VUR, which can lead to many conditions, from urinary tract infections to kidney failure, it can be considered one of the most common causes of morbidity due to the urinary system in children. Congenital ureteral diverticulum is one of the rare congenital conditions that is one of the most important obstacles to the spontaneous resolution of vesicoureteral reflux in pediatric patients (3-5).

2. Case report

A 4-year-old boy had been treated several times due to a recurrent urinary tract infection. It was referred to us in terms of the investigation of possible surgical causes. When the case history was analyzed, it was observed that antenatal ultrasound was not performed. When the patient was 2 years old, an ultrasound was performed because of recurrent urinary tract infections. After that, the right vesicoureteral reflux and hydronephrosis were diagnosed. Voiding cysto-urethrography (VCUG) showed that right grade 5 VUR. Mercaptoacetyltriglycine (MAG-3) scintigraphy showed that the right kidney was relatively reduced in size. Since there was no MAG-3 result before, there was no possibility to compare. It was thought that right renal perfusion was reduced. It was seen that right renal functions were reduced to 20%. Based on all these findings, the patient was prepared for robotic-assisted laparoscopic ureteral extravesical reimplantation (RALUR-EV). During the RALUR-EV procedure, after exposing the right distal intramural ureter, a lesion thought to be a true congenital diverticulum was observed. The diverticulum that was not encountered in radiological studies before the operation was taken off, along with ureteral excision, and a reimplantation procedure was performed. A JJ catheter was inserted, and the procedure ended without complication. The patient was discharged on the second postoperative day. When the excised part was examined macroscopically, it was considered a congenital ureteral diverticulum with a single ureteral wall (Fig. 1). The biopsy piece was reported to be compatible with a congenital ureteral diverticulum by the pathology department

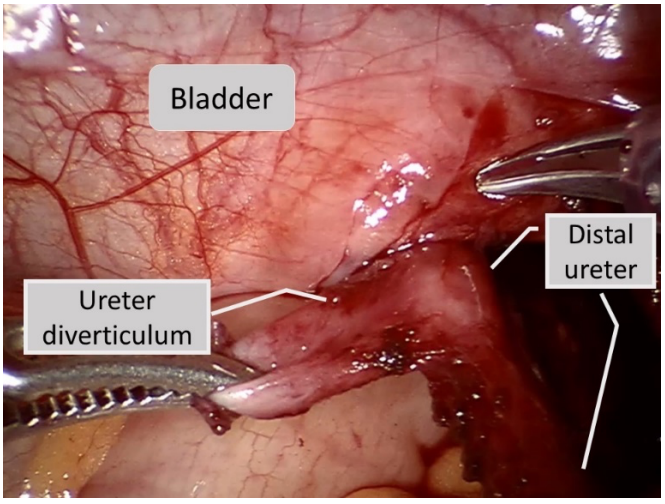

Fig. 1. The ureteral diverticula was shown in the picture. The diverticula was exposed by dissecting from the intramural part of the distal ureter.

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3. Discussion

The congenital ureteral diverticulum is one of the rarest urological conditions. When the case reports in the literature are examined, it is seen that only a few cases have been reported in children (4). Congenital ureteral diverticulum as a possible cause of VUR was mentioned by *Ambrose* in 1962[5]. Spontaneous resolution rates are up to 50% in children aged 1-4 years with vesicoureteral reflux. This rate is approximately 70% for female patients with grade 1-3 VUR (6). Although there are authors who advocate IV pyelography (IVP) in the diagnosis of ureteral diverticulum, IVP and similar methods with low sensitivity may not always be useful in detecting diverticulum, especially lower ureteric ones. According to *McLoughlin*, ureteral diverticula are divided into three groups: 1) blind-ending bifid ureters (abortive duplications), 2) congenital diverticulum, and 3) acquired diverticulum due to mucosal herniation[4]. Mucosal herniation and acquired diverticulum due to lower ureteral stones are manifested by hematuria, flank pain, and dysuria, whereas congenital ureteral diverticula are usually asymptomatic and detected incidentally (4, 7). While treatment of diverticulum is not recommended in asymptomatic cases, treatment can be applied in cases with symptoms such as obstruction. The treatment of choice is the removal of the diverticulum (3). Robotic surgery, which allows smaller surgical instruments to perform finer movements in narrower areas, has gained increasing popularity in the field of pediatric surgery in recent years. RALUR-EV is one of the surgical approaches that has become widespread in vesicoureteral reflux surgery in recent decades. It is almost replacing intravesical interventions. In some institutions, cystoscopy before this procedure has become a standard practice. However, preoperative cystoscopy was not performed in our case (8-10). It is difficult for us to predict whether the unexpected diverticular lesion seen in the distal intramural ureter could have been seen on cystoscopy.

In conclusion, detecting an intramural congenital diverticulum in the lower ureter, which may result from reduced kidney function and is mostly found incidentally during surgery, is challenging. In persistent cases with high-grade VUR, congenital ureteral diverticula should be kept in mind. Cystoscopy should be performed prior to RALUR-EV intervention if appropriate conditions are available.

Informed consent

Consent of the patient and parents was obtained.

Conflict of interest

All authors have disclosed no conflicts of interest.

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Authors' contributions

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