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Right Ectopic Ureter Associated with Ureterocele in an Adult Female: A Rare Case Report

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1. . INTRODUCTION

Ectopic ureter is a rare congenital anomaly resulting from abnormal development of the ureteric bud and its insertion into the urinary tract. The overall incidence is estimated between 0.025% and 0.05%, with a strong female predominance (female-to-male ratio 2–6:1).[1] In females, the ectopic orifice may be located anywhere from the bladder neck to the perineum, most commonly draining into the urethra (45%), vagina (35%), or vestibule (15%).

The underlying pathogenesis involves improper interaction between the ureteric bud and the mesonephric duct during embryogenesis. Malposition of the ureterovesical junction may result in ectopic insertion and is often associated with ureterocele formation due to incomplete muscular development at the junction.[2]

Clinically, female patients with ectopic ureters typically present with continuous urinary incontinence despite normal voiding patterns, which may be misdiagnosed or overlooked during childhood.[3] As a result, diagnosis in adulthood is uncommon and usually delayed until symptoms become intolerable or complicated by infections and hydronephrosis.

We report the case of a 26-year-old female with a right ectopic ureter associated with ureterocele, presenting with lifelong urinary incontinence. This case highlights the importance of multimodal imaging for accurate diagnosis and the role of reconstructive surgery in preserving renal function and restoring continence

2. . CASE PRESENTATION

A 26-year-old female presented to the emergency department with a lifelong history of continuous urinary leakage. She denied urgency, stress-related leakage, dysuria, hematuria, cloudy urine, or passage of stones. The patient reported requiring 9–10 diapers daily since childhood but had previously declined surgery.

Imaging evaluation

Renal ultrasonography demonstrated a poorly defined border between the renal parenchyma and central echocomplex, with dilatation of the pelvicalyceal system and ureter extending from proximal to distal. The dilated distal ureter was visualized posterior to the bladder

(**Figure 1A**). Abdominal–pelvic computed tomography revealed tortuous dilation of the right ureter along its entire course, with the distal ureter appearing to insert into the vagina

(**Figure 1B**). Magnetic resonance urography further confirmed a dilated right ureter inserting between the urethra and vaginal introitus, consistent with ectopic ureter into the vaginal vestibule, accompanied by grade II hydronephrosis and hydroureter (**Figure 1C**). The left kidney and ureter were normal.

Operative management

The patient underwent cystoscopy (**Figure 2**). The right ureteral orifice could not be identified, prompting open ureteral exploration. Intraoperatively, the right ureter was markedly dilated (approximately 10 times normal size). A ureterotomy and distal probing with a ureteral catheter revealed the orifice exiting into the urethra. The ureter was mobilized distally, and

ureteral reimplantation was performed using the Lich-Gregoir technique with placement of a right double-J (DJ) stent (**Figure 3**).

Postoperative course

The patient had an uneventful recovery. She remained hospitalized for three days, during which the surgical wound was dry and drainage minimal. Urine output was adequate (1200 mL/24 h), with clear yellow urine. One week after surgery, a plain abdominal radiograph demonstrated the DJ stent in correct position, with no evidence of ileus (**Figure 4**). Laboratory studies were within normal limits. The patient was discharged with resolution of incontinence and was scheduled for regular outpatient follow-up.

3. DISCUSSION

Ectopic ureter is a rare congenital anomaly in which the ureteral orifice drains outside its normal position in the trigone of the bladder. The reported incidence is between 0.025% and 0.05%, with a female predominance ranging from 2:1 to 6:1.[1,2] In females, ectopic ureters most commonly insert into the urethra (45%), vagina (35%), or vestibule (15%).[2] While this condition is usually diagnosed during childhood because of symptoms such as urinary tract infections (UTIs), hydronephrosis, or urinary incontinence, its presentation in adults is uncommon, leading to delayed recognition and treatment.[4]

Embryology and pathogenesis

The anomaly results from abnormal development of the ureteric bud from the mesonephric duct during the fourth to fifth week of gestation. A laterally positioned ureteric bud may migrate caudally, resulting in ectopic ureteral insertion.[3,5,6] Maldevelopment of the ureterovesical junction may also lead to ureterocele formation due to defective muscularization at the orifice.[3]

Clinical featuresand diagnostic challenges

In females, the classic presentation is continuous urinary incontinence despite normal voiding patterns, as the ectopic orifice bypasses the urethral sphincter mechanism. However, many cases remain unrecognized until adulthood, when complications such as hydronephrosis, infection, or stone formation occur.[4,7] In contrast, male patients rarely experience incontinence because the ectopic opening is usually proximal to the external sphincter.[8,9] Associated complications include recurrent urinary tract infections, hydronephrosis, and progressive renal dysfunction if diagnosis is delayed.[1,9] Our patient presented with lifelong incontinence requiring multiple diapers per day, consistent with prior reports where delayed diagnosis resulted in significant morbidity and impaired quality of life.[10,11]

Imaging plays a crucial role in diagnosis. Ultrasonography often provides the first clue by showing hydronephrosis or ureteral dilatation, but advanced imaging such as computed tomography urography and magnetic resonance urography are frequently needed to define the exact site of insertion and the presence of associated ureterocele.[9,12] Nuclear imaging (e.g., DMSA scan) may further assess split renal function.[13,14] Cystoscopy with retrograde pyelography remains a valuable intraoperative diagnostic tool, especially when the ectopic orifice cannot be visualized.[15] In this case, multimodal imaging confirmed a right ectopic ureter inserting into the vaginal vestibule, complicated by hydronephrosis and ureterocele, consistent with findings from prior reports.

Surgical management

The goals of management are preservation of renal function, relief of obstruction, elimination of incontinence, and prevention of recurrent infections.[16] Treatment approaches vary depending on patient age, renal function, type of ureterocele, and anatomical considerations.

Endoscopic management has traditionally been considered the first-line option in children, especially transurethral puncture or incision of the ureterocele. However, high rates of vesicoureteral reflux (VUR) and secondary interventions have been reported. Kajbafzadeh et al. proposed a novel technique combining double puncture with fulguration, which significantly improved outcomes compared to simple incision or unroofing.[16] Similarly, conservative treatment may be considered in select asymptomatic patients with mild hydronephrosis, non-obstructive ureteroceles, or poor-functioning renal units.[17]

Open or reconstructive surgery is often reserved for symptomatic adults or those with complex anatomy. Surgical intervention is tailored to the function of the affected renal unit. If the ipsilateral moiety is functional, reconstructive options such as ureteral reimplantation or ureteroureterostomy are preferred to preserve renal parenchyma.[8,18,19] In contrast, non-functional moieties may be managed by heminephrectomy or nephroureterectomy. The Lich-Gregoir extravesical reimplantation technique, as performed in this patient, is a well-established procedure with favorable outcomes.[20] Laparoscopic and robot-assisted approaches are increasingly reported, offering reduced morbidity while maintaining comparable efficacy. In our case, ureteral reimplantation using the Lich-Gregoir technique provided definitive resolution of symptoms, preserved renal function, and eliminated the need for multiple procedures.

Comparison with published literature

Adult presentations of ectopic ureterocele are rare, but several reports have documented variable presentations including flank pain, recurrent UTIs, hematuria, bladder outlet obstruction, or stones within the ureterocele.[4,7] For example, Atta et al. described an adult patient with ureterocele complicated by a large calculus, successfully managed with endoscopic deroofing and stone removal[7], while Jawaid et al. reported a giant ureterocele prolapsing into the urethra, treated with endoscopic incision.[4] These cases highlight the heterogeneity of clinical manifestations and the importance of tailoring management to the individual. Our patient differs from these previously reported cases in that her primary symptom was lifelong incontinence, without recurrent infections or stones, yet associated with significant ureteral dilatation and hydronephrosis. The successful outcome following ureteral reimplantation further emphasizes that surgical reconstruction remains a cornerstone for definitive treatment in adults with symptomatic ectopic ureter and ureterocele, particularly when renal preservation is feasible.

Prognosis

Prognosis following appropriate surgical correction is generally favorable, with restoration of continence and prevention of long-term renal damage.[10] Nevertheless, long-term follow-up is essential to monitor renal function, detect possible recurrence of hydronephrosis, and assess continence outcomes.

4. CONCLUSION

Ectopic ureter with ureterocele is a rare congenital anomaly that may present in adulthood with lifelong continuous incontinence. Multimodal imaging is essential for diagnosis, and nephron-sparing surgery such as ureteral reimplantation offers good functional and continence outcomes.

Figure Legends

Figure 1. (A) Kidney and Bladder Ultrasonography; (B)Abdomino-Pelvic CT-Scan; (C) MR Urethrography.

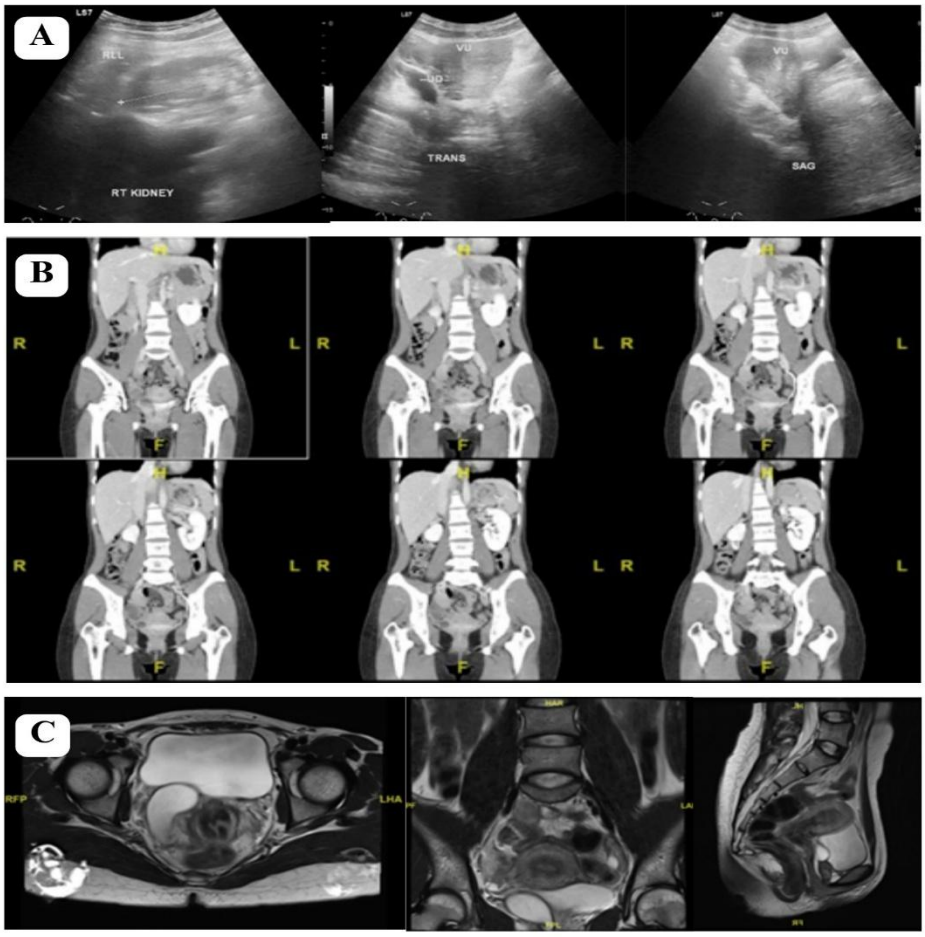

Figure 2. Cystoscopy Visualization of Left Ureteral Orifice

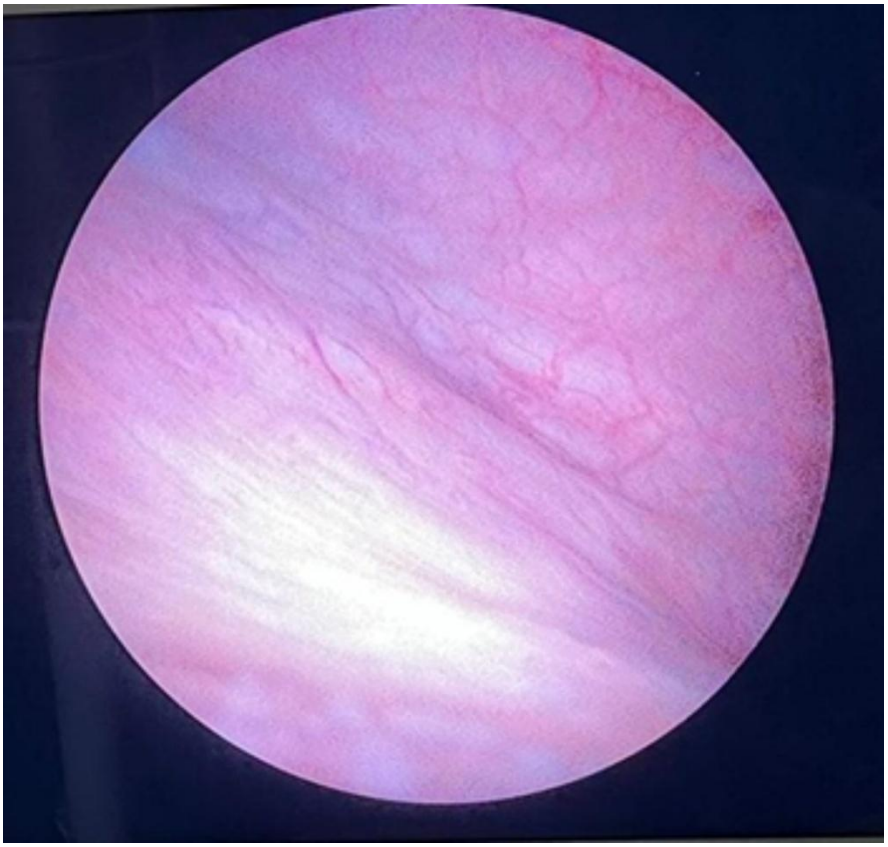

Figure 3. Interaoperative Findings; (A) An ectopic right ureter was found; (B,C) A sondage was performed to the distal right ureter opening into the urethra, (D) Post ureteral reimplantation

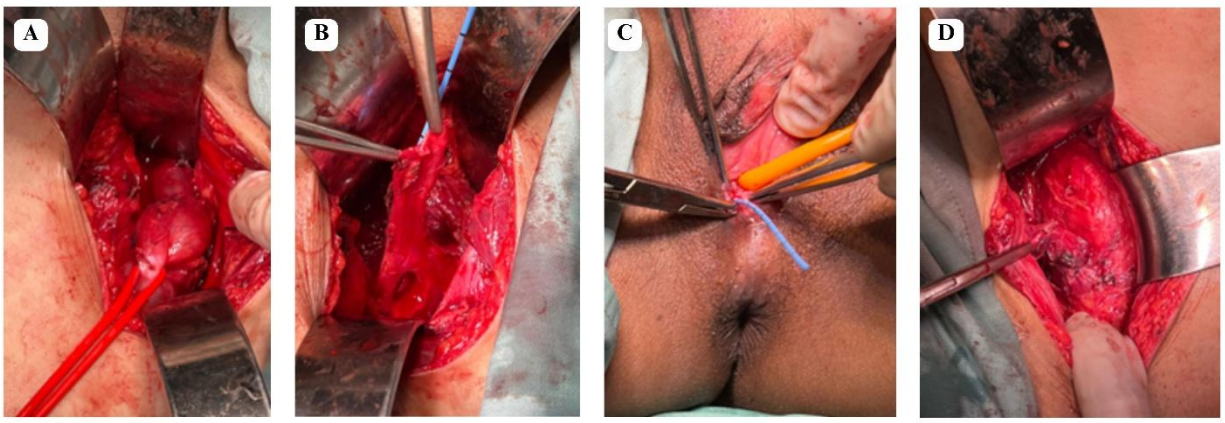

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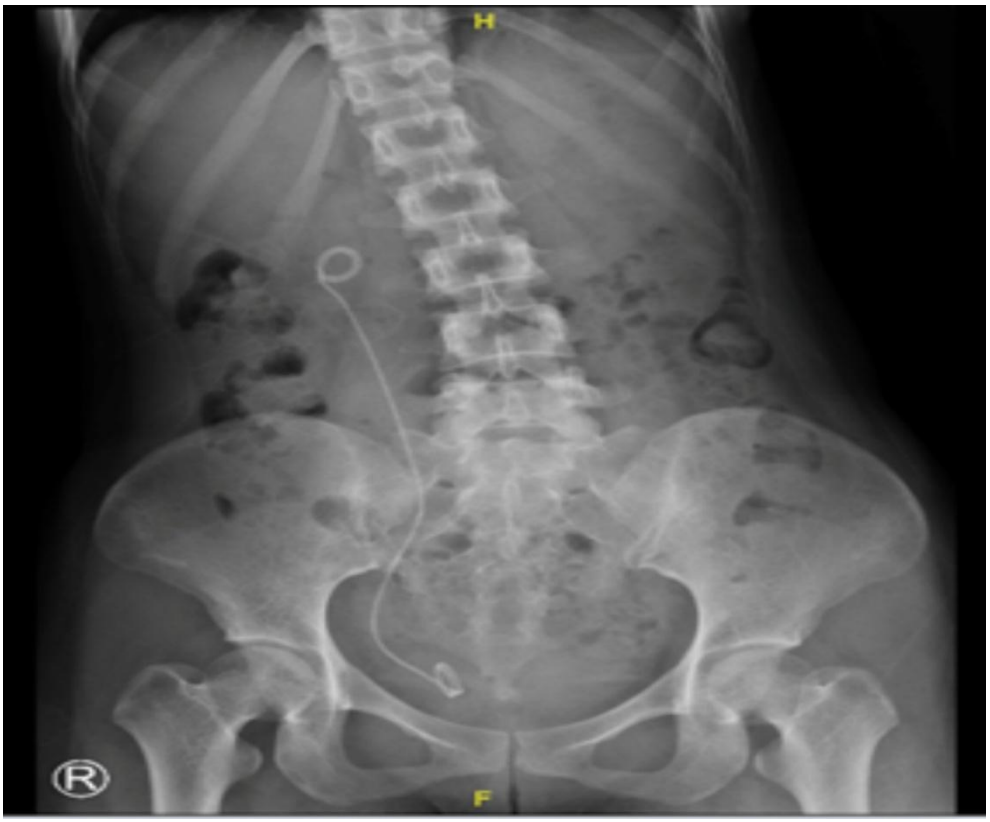
Figure 4. Postoperative Radiograph.



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