

Unilateral Pelvic Ectopic Kidney with Single-System Ectopic Ureter Causing Continuous Urinary Incontinence in an 11-Year-Old Girl: A Case Report

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Case Report

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Abstract

Pelvic ectopic kidney associated with a single-system ectopic ureter is rare. In females, ectopic ureter often presents with lifelong continuous urinary incontinence. An 11-year-old girl presented with continuous urinary leakage since birth despite normal voiding. Imaging demonstrated an atrophic left pelvic kidney with a dilated single ectopic ureter inserting distal to the urethral sphincter. The contralateral kidney was normal with compensatory hypertrophy. Intravenous pyelography showed non-function of the left kidney. Open left nephroureterectomy was performed due to a non-functional hydronephrotic kidney. Urinary incontinence resolved completely postoperatively. Recovery was uneventful. Single-system ectopic ureter should be suspected in girls with continuous incontinence. Surgical removal of a non-functional ectopic kidney offers definitive management.

Clinical Key Message

Continuous urinary incontinence in a girl with normal voiding strongly suggests ectopic ureter. Although usually associated with duplex systems, single-system ectopic ureter can occur with a non-functioning ectopic kidney. Timely imaging and nephroureterectomy can provide definitive cure and prevent long-term psychosocial and urological complications.

Introduction

Renal ectopia is a congenital anomaly resulting from failure of normal cephalad migration of the metanephric kidneys between the sixth and ninth weeks of gestation[1]. The most common form is pelvic kidney, which occurs when ascent is arrested within the pelvis [2]. Although many ectopic kidneys remain asymptomatic, they are frequently associated with malrotation, aberrant vascular supply, ureteropelvic junction obstruction, vesicoureteral reflux, and other urological anomalies [2][3].

An ectopic ureter is another congenital abnormality arising from improper incorporation of the ureteric bud into the bladder trigone [4]. In females, ectopic insertion distal to the external urethral sphincter leads to continuous urinary incontinence despite preserved voluntary voiding [5]. Most ectopic ureters occur in association with duplicated collecting systems. Single-system ectopic ureter without duplication is rare and is more often associated with a dysplastic or poorly functioning kidney [6].

The coexistence of a pelvic ectopic kidney and a single-system ectopic ureter is uncommon and poses diagnostic and therapeutic challenges [7]. We report a case of an 11-year-old girl with lifelong continuous urinary incontinence caused by a non-functional pelvic ectopic kidney with a single ectopic ureter, successfully treated by nephroureterectomy.

Case history

An 11-year-old girl presented with continuous urinary leakage since birth. According to her mother, the child voided normally with a good urinary stream; however, she remained persistently wet throughout the

day and night. There was no history of dysuria, haematuria, flank pain, recurrent febrile urinary tract infections, or constipation. Developmental milestones were appropriate for age. The condition had significant psychosocial impact, requiring the child to wear diapers at school.

Methods (differential diagnosis, investigations and treatment)

On examination, she was in good general condition with stable vital signs and normal blood pressure. Abdominal examination was unremarkable, with no palpable masses. Perineal examination revealed continuous leakage of clear urine from the vaginal introitus. No external genital anomalies were observed. Laboratory investigations, including full blood count, serum electrolytes, urea, and creatinine, were within normal limits, indicating preserved overall renal function.

Ultrasound of the abdomen and pelvis demonstrated an atrophic hydronephrotic left pelvic kidney measuring 4.7×2.0 cm, located near the left iliac vessels (Fig. 1A). A markedly dilated left ureter was visualized, bypassing the bladder trigone and extending distally toward the urethral/vaginal region. The right kidney was orthotopic, structurally normal, and showed compensatory hypertrophy. The urinary bladder appeared normal.

Intravenous pyelography revealed non-opacification of the left kidney, consistent with nonfunction, and normal excretion from the right kidney (Fig. 1B). Contrast-enhanced computed tomography confirmed an empty left renal fossa, a small pelvic ectopic kidney with hydronephrosis, and a dilated single ureter. No ureteral duplication was identified (Fig. 2A).

Given the non-functional status of the left kidney and the presence of a symptomatic ectopic ureter, surgical management was planned. An open left nephroureterectomy was performed through a lower midline incision. Intraoperatively, the ectopic kidney was located below the common iliac artery, with the renal artery arising from the left common iliac artery (Figs. 3A, B, 4A). The kidney was markedly hypoplastic. The ureter was dilated and inserted ectopically distal to the sphincteric mechanism. The renal vessels were ligated, and the kidney and ureter were excised in entirety (Fig. 2B). The histopathology of the resected specimen demonstrated structurally normal renal and ureter parenchyma.

Conclusions and Results (outcome and follow-up)

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The postoperative course was uneventful (Fig. 4B). The patient resumed feeding and ambulation on the first postoperative day. Following catheter removal, continuous urinary leakage ceased completely. At follow-up review, she remained continent and clinically stable, with preserved function of the solitary right kidney.

Discussion

Continuous urinary incontinence in a female child with normal voluntary voiding is a classic presentation of ectopic ureter inserting distal to the external urethral sphincter. Because urine from the affected renal unit bypasses sphincteric control, leakage persists despite normal bladder emptying [5]. This clinical pattern should prompt early imaging evaluation.

Ectopic ureters are most frequently associated with duplex collecting systems, particularly affecting the upper pole moiety [8]. In contrast, single-system ectopic ureters are uncommon and are often linked to renal dysplasia or severe hypoplasia [9]. In such cases, the affected kidney is frequently non-functional at the time of diagnosis.

The association of pelvic renal ectopia with a single ectopic ureter is rare [7]. Abnormal ascent of the kidney may disrupt ureteric bud positioning and vascular development, resulting in both ectopia and aberrant insertion. Aberrant vascular supply, commonly from iliac vessels, must be anticipated during surgical planning [10].

Imaging plays a critical role in diagnosis and treatment planning. Ultrasonography provides initial localization and structural assessment. Intravenous pyelography or contrast-enhanced CT helps determine renal function and anatomy [11]. In our patient, absence of contrast excretion confirmed nonfunction, eliminating the need for renal preservation strategies such as ureteric reimplantation.

Management depends primarily on renal function. In cases with preserved function, ureteric reimplantation or reconstructive surgery may be considered. However, when the kidney is severely dysplastic or non-functional, nephroureterectomy is the definitive treatment [12]. Complete excision prevents persistent infection, obstruction, or future complications and resolves incontinence.

Early recognition is essential, as prolonged untreated incontinence may lead to psychological distress, social stigma, and reduced quality of life [13]. Following surgery, patients with a solitary functioning kidney require periodic monitoring of blood pressure, renal function, and urinalysis.

Conclusion

Single-system ectopic ureter should be suspected in any girl presenting with lifelong continuous urinary incontinence despite normal voiding. Comprehensive imaging is essential to evaluate renal position, anatomy, and function. When associated with a non-functional pelvic ectopic kidney, nephroureterectomy provides definitive treatment with excellent continence outcomes. Early diagnosis prevents prolonged psychosocial morbidity and allows appropriate long-term surveillance of the solitary kidney.

Declarations

Consent for Publication

Written informed consent for publication of the clinical details and clinical images was obtained from the parent. A copy of the consent form is available for review by the Editor of this journal upon request.

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Author Contribution

D.M-Wrote the original draft of the manuscript, Conceptualization, project administrationM.M.M- Review and editing, supervisionF.O-Review and editing, supervisionA.M- Data compilationA.M-Writing, review, editing

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Figures

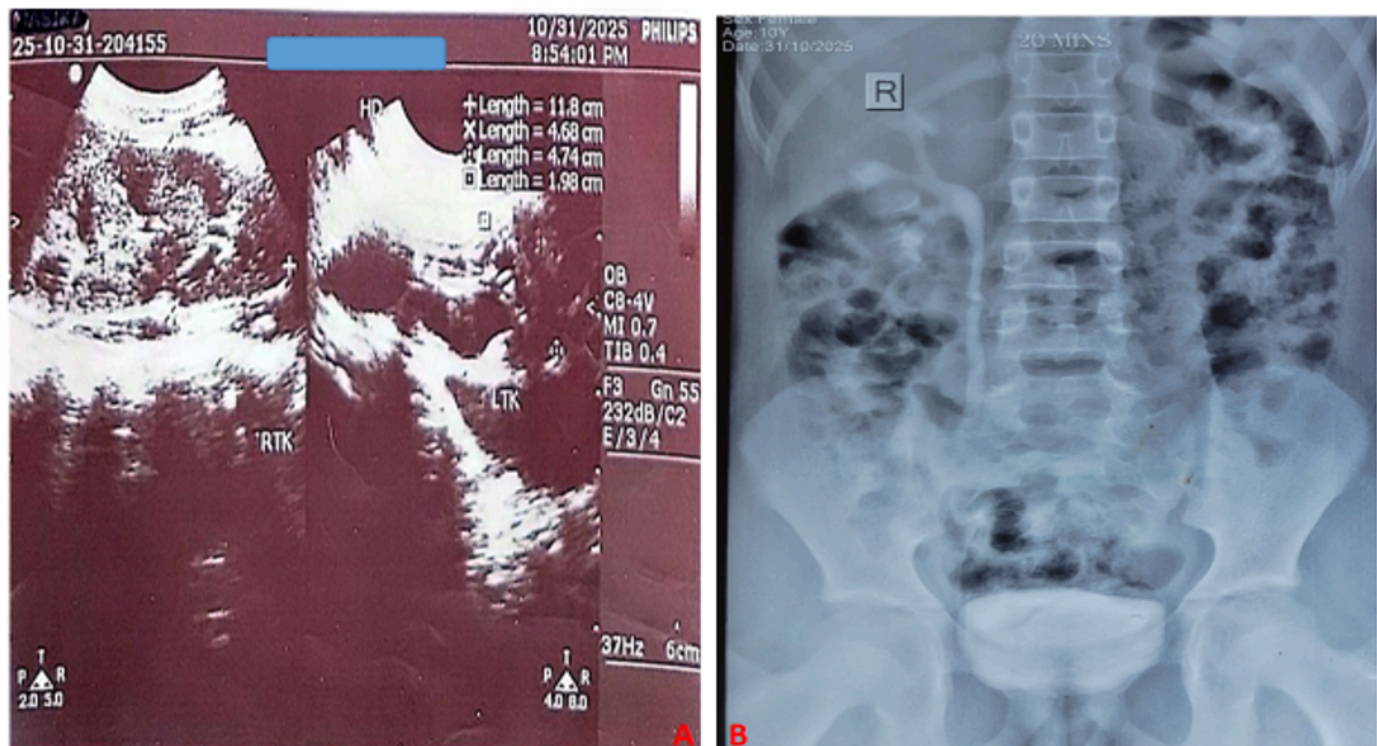


Figure 1

(A) Kidney–ureter–bladder abdominal ultrasound demonstrates an atrophic, hydronephrotic left pelvic kidney measuring 4.74×1.98 cm, located along the left iliac vessels, superior to the ipsilateral ovary. The dilated left ureter bypasses the trigonal insertion and exhibits ectopic insertion into the distal urethral/vaginal region. (B) Intravenous pyelogram obtained at 20 minutes demonstrates an atrophic hydronephrotic left pelvic kidney with a left ectopic megaureter. The right kidney appears normal, without hydronephrosis.

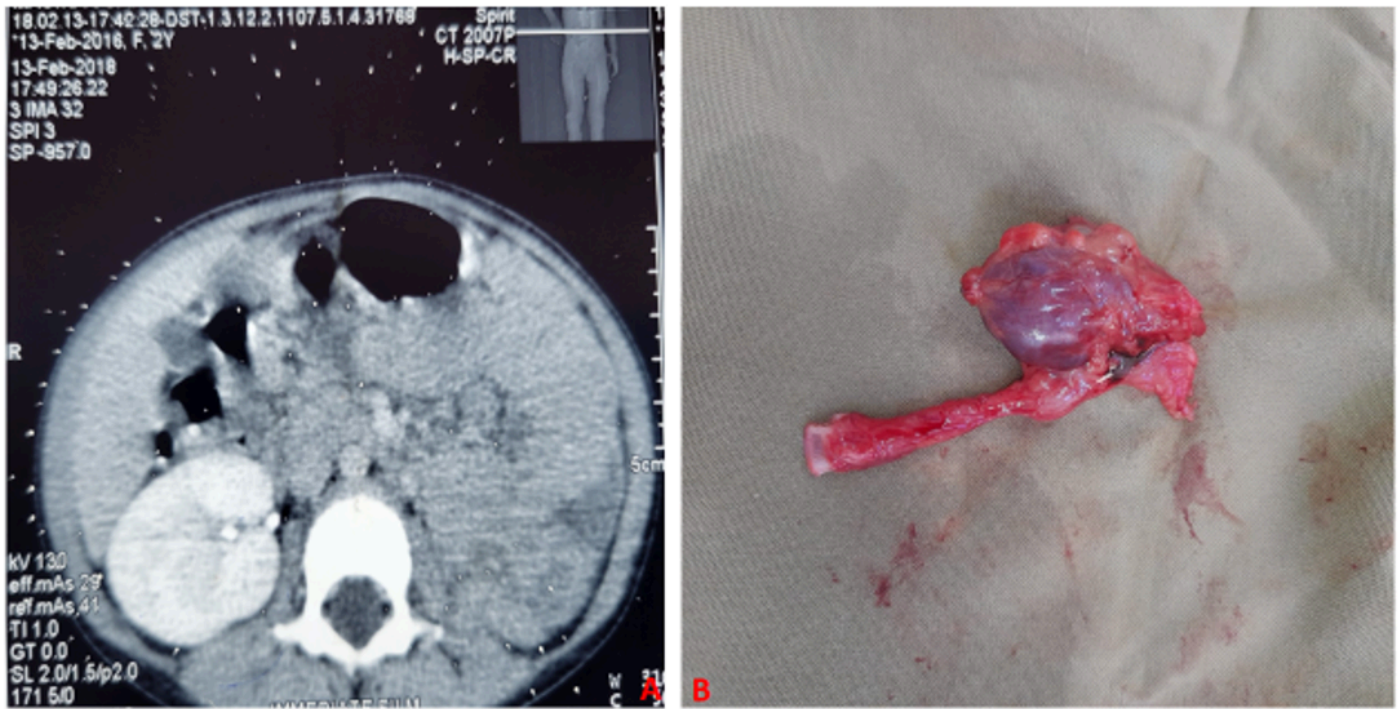


Figure 2

(A) Contrast-enhanced axial CT image demonstrates a normally positioned right kidney with an empty left renal fossa. (B) Gross specimen demonstrates the left pelvic kidney with the proximal ectopic ureter following nephroureterectomy.

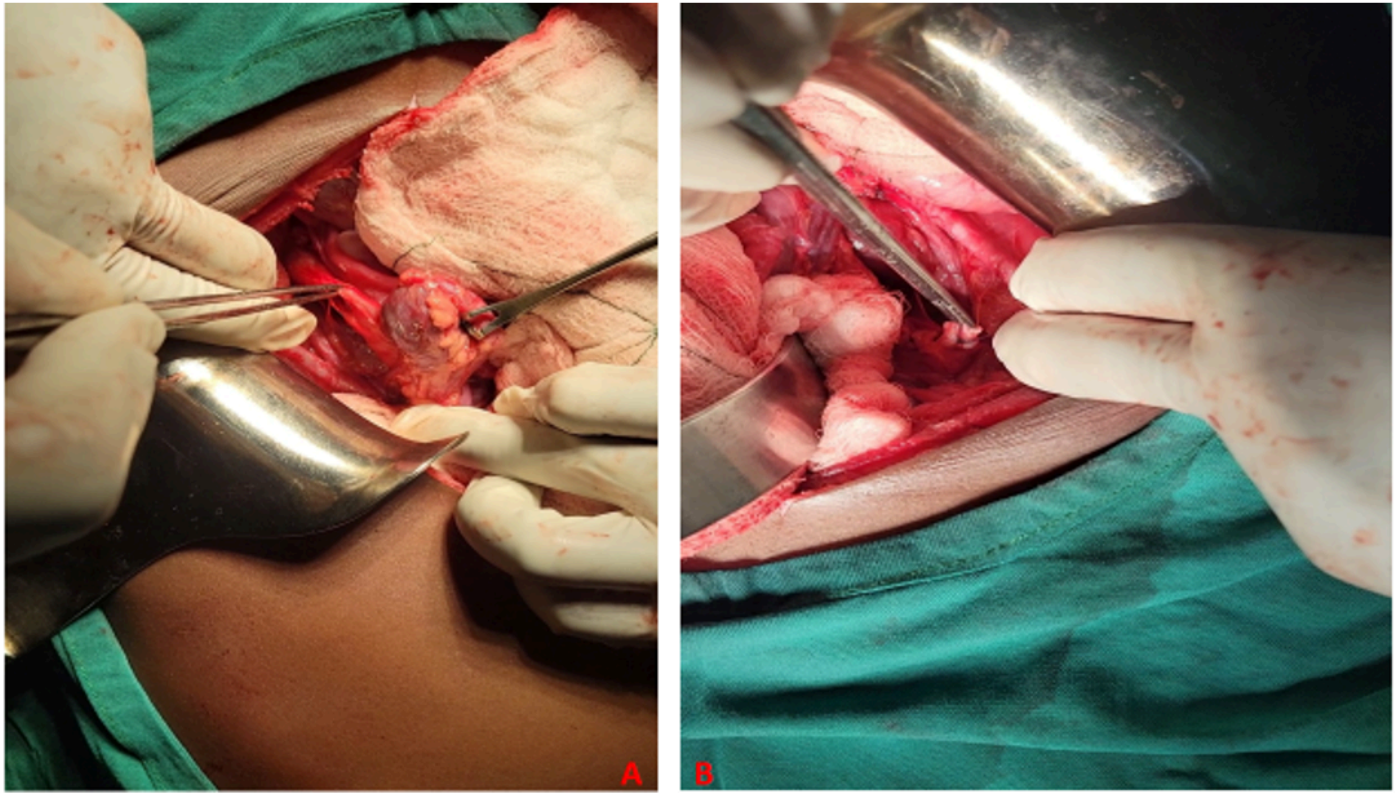


Figure 3

(A) Intraoperative view demonstrates the left pelvic ectopic kidney with its hilum, a single (non-duplicated) ectopic ureter, and the left renal artery arising from the left common iliac artery.

(B) Stump of the left ectopic ureter following nephroureterectomy.



Figure 4

(A) Intraoperative view demonstrates the stump of the left renal artery arising from the left common iliac artery following nephrectomy. The bifurcation of the left common iliac artery into the external and internal iliac arteries is clearly visualized. (B) Subumbilical abdominal incision one week postoperatively.