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Segmental Renal Dysplasia Associated with Ectopic Ureter in an Adolescent Boy with Persistent Flank Pain

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Description

A thirteen-year-old boy presented to a tertiary pediatric urology center with intermittent right flank pain that had persisted for approximately eighteen months. The pain episodes occurred several times each month and were occasionally accompanied by nausea and reduced appetite. The patient had visited local emergency departments repeatedly, where abdominal ultrasonography and laboratory investigations failed to identify a definitive cause. Symptomatic treatment with analgesics provided only temporary relief.

The adolescent had no prior surgical history and no known congenital abnormalities. Growth parameters were appropriate for age. Physical examination demonstrated mild tenderness over the right flank without palpable abdominal mass. Blood pressure remained within normal pediatric limits. Laboratory investigations showed normal renal function and absence of inflammatory markers. Urinalysis revealed microscopic hematuria without pyuria or bacteriuria. Initial ultrasonography at the referral center demonstrated a small irregular upper pole of the right kidney with localized cortical thinning. The lower renal pole appeared normal. Mild dilatation of a tubular structure extending inferiorly from the upper pole was noted, although the distal course remained difficult to identify. Because of persistent pain and uncertain anatomy, magnetic resonance urography was performed.

Imaging revealed a duplicated collecting system on the right side. The upper moiety appeared dysplastic and poorly functioning with multiple cystic changes. A dilated ectopic ureter extended from the dysplastic segment and inserted distal to the bladder neck near the prostatic urethra. The lower pole collecting system displayed preserved drainage and normal renal parenchyma. Nuclear renal scintigraphy demonstrated minimal function within the dysplastic upper segment, accounting for less than 8% of total right renal contribution. Detailed questioning after imaging revealed occasional urinary dribbling following voiding, although the patient had not considered this symptom clinically significant. No recurrent urinary infection had occurred during childhood. The combination of segmental dysplasia and ectopic ureter explained both the chronic discomfort and urinary symptoms. Following multidisciplinary discussion, laparoscopic upper pole heminephrectomy with excision of the ectopic ureter was recommended. The family agreed to operative management because conservative observation would not resolve symptoms and persistent ectopic drainage

carried risk of recurrent infection.

Under general anesthesia, the patient was positioned in a modified lateral decubitus position. Four laparoscopic ports were introduced. Intraoperative inspection confirmed duplicated renal anatomy with a dysplastic upper pole segment demonstrating fibrotic appearance and reduced vascular supply. Careful dissection isolated the dilated ectopic ureter descending toward the pelvis. The ureter was divided distally near its ectopic insertion and traced proximally toward the upper pole moiety. Postoperative recovery progressed smoothly. The patient resumed oral intake on the first postoperative day and reported substantial reduction in flank discomfort. Drain output remained insignificant and was removed after forty-eight hours. Histopathological examination confirmed segmental renal dysplasia characterized by immature tubules, fibrous stroma, and cystic degeneration. No malignant features were identified.

Duplicated collecting systems represent among the more frequent congenital urinary tract anomalies, although associated ectopic ureter and dysplastic upper pole combinations remain less common in male patients. Clinical presentation differs significantly between sexes. Female patients often present with continuous urinary leakage because ectopic insertion may occur distal to the external sphincter. In males, ectopic ureters typically insert proximal to the sphincteric mechanism, resulting in subtler symptoms such as infection, flank discomfort, or epididymal irritation. The delayed diagnosis in this patient reflected the nonspecific nature of symptoms. Chronic abdominal or flank pain in adolescents may arise from gastrointestinal, musculoskeletal, or renal causes. Conventional ultrasonography performed previously failed to define the abnormal collecting system completely. Advanced cross-sectional imaging therefore played an important role in clarifying anatomy and guiding operative planning.

Renal dysplasia develops because of abnormal interaction between the ureteric bud and metanephric tissue during embryogenesis. In duplicated systems, the upper moiety frequently demonstrates ectopic drainage and dysplastic development according to the Weigert-Meyer principle. Reduced function within the dysplastic segment often justifies surgical excision, particularly when symptoms persist. The ectopic ureter itself may contribute to discomfort because chronic urine stasis predisposes to distension and inflammation. Distal ectopic insertion near the prostatic urethra explained the minor postvoid dribbling described by the patient. Symptom recognition required careful clinical interviewing because adolescents may hesitate to discuss urinary complaints spontaneously.

Conclusion

Minimally invasive approaches have gained increasing acceptance in pediatric urology because of reduced postoperative discomfort and shorter recovery periods. Nevertheless, operative complexity rises in duplicated systems because of variable vascular and ureteral anatomy. Preoperative magnetic resonance urography significantly assisted procedural preparation in this case. Segmental renal dysplasia associated with ectopic ureter may remain undetected until adolescence because of subtle urinary symptoms. Persistent unexplained flank pain in children should prompt detailed radiological assessment when routine evaluation remains inconclusive. Laparoscopic upper pole heminephrectomy with ureteral excision achieved complete symptom resolution and preservation of healthy renal tissue in this adolescent patient.