Pediatrics

Rare case: Ureteropelvic junction complication presenting with bilateral labial abscesses and urosepsis requiring nephrectomy

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ABSTRACT

Ureteropelvic junction obstruction (UPJO) is the most common cause of urinary tract obstruction in pediatric patients. Debates in management include ureteral stent versus nephrostomy tube placement prior to surgical correction if intervention is warranted. We present a female patient with left UPJO, diagnosed at 15-years-old, treated with ureteral stent placement. Stent removal two years later resulted in extensive complications, including retroperitoneal infection, labial abscesses, and nephrectomy. Management of UPJO in the pediatric population prior to surgical correction is not well-standardized. The severity of complications following the removal of the two-year-old stent suggests caution for placing ureteral stents without proper follow-up.

Introduction

The management of ureteropelvic junction obstruction (UPJO) is not well-standardized. While the mainstay of treatment is typically surgical, if kidney function is diminished or acute pain is present, a percutaneous nephrostomy tube (PCNT) may be used, solely as a temporizing measure, to aid drainage until function can be reevaluated. We present a novel case in which a UPJO was temporized with ureteral stent without follow-up surgical correction. Stent removal two years later was followed by complicated urosepsis, extensive retroperitoneal pan-sensitive infection, labial abscesses, and nephrectomy. To our knowledge, the severity of complications seen in this pediatric patient following stent removal has not been previously reported.

Case presentation

A 17-year-old female was diagnosed with left UPJO at age 15 secondary to recurrent urinary tract infections, for which she underwent stent placement at an outside institution (Fig. 1A). After an uneventful two years, the stent was removed as an outpatient procedure. Seven days later she presented to the emergency room with flank pain, nausea, vomiting, anorexia, and dysuria. Her labs were remarkable for acute kidney injury (BUN 68 mg/dL; creatinine 0.92 mg/dL) and sepsis (WBC 22.94 thous/mm³). The admission CT abdomen/pelvis showed an enlarged left kidney with a dilated renal collecting duct and large amount of complicated fluid in the perinephric fat in the retroperitoneum (Fig. 1B–C). The outside hospital urgently replaced her stent (Hospital course day 1, HC-1).

She was started on empiric vancomycin (HC-2 - HC-4) and meropenem (HC-2 - HC-11), and her admission urine culture grew pan-sensitive E. coli. On HC-9, she developed bilateral labial swelling with spontaneous purulent drainage, consistent with large abscesses (Fig. 2A) extending over the inguinal ligament and necessitating operative drainage. Repeat imaging revealed moderate hydronephrosis with persistent fluid collections in the left perinephric space, retroperitoneum, and pelvis.

Due to increasing complexity of the case, the patient was transferred to our tertiary-care hospital on HC-13 for pediatric urology evaluation. The perinephric abscess was found to extend into the pelvis and inguinal canal (Fig. 2B). Interventional radiology (IR) placed multiple
During an initial hospitalization, the patient underwent nephroureteral revascularization (NUR) and a stent was placed for hydronephrosis. Despite the stent remaining in place for three months, the patient developed complications including renal scintigraphy showing 24% residual function of the left kidney, requiring every measure to prevent nephrectomy. A repeat CT showed worsening of the left perinephric abscess, so PCNT was placed. However, the retroperitoneal abscess persisted. Eventually, due to no improvement in the clinical course, the patient underwent operative washout on HC-33 during which a nephrectomy was deemed preventable. Postoperative course was complicated by wound infections and ongoing retroperitoneal fluid collections that required additional drain placement on HC-48. She was ultimately discharged on HC-62 with one percutaneous drain still in place.

The patient had a complex hospital course, receiving various broad-spectrum antibiotics for a pan-sensitive \( E. \text{coli} \) infection that did not clear until extraordinary measures were taken. Due to the invasiveness of her infection, there were concerns of an underlying immunodeficiency, however, she was deemed immunocompetent following a thorough laboratory workup. One month after discharge, the patient was much improved, and her remaining percutaneous drain was removed. She is clinically doing well today.

Discussion

To the best of our knowledge, UPJO and stent removal leading to complications of this severity has never been reported in immunocompetent pediatric or adult patients. There are two interesting discussions pertaining to her case: the management of UPJO and her persistent pan-sensitive urosepsis.

While the details of stent removal remain unclear, it is likely the stent had become encrusted with biofilm and calcifications that damaged the UPJ and ureter during removal, seeding bacteria throughout the retroperitoneum. The surrounding soft tissue was unable to heal and continued to leak fluid into the retroperitoneal space. The infection tracked further down to the inguinal canal, resulting in a large retroperitoneal abscess with bilateral labial abscesses.

The ideal indwelling time for ureteral stents is generally agreed to be between 2 and 4 months and incidence of encrustation increases dramatically in stents left in place after 12 weeks. A combination of endourologic approaches can be considered when removing indwelling stents that have evidence of encrustation on work-up, such as extracorporeal shock wave lithotripsy. More careful antecedent workup prior to stent removal could have reduced morbidity in this case. Furthermore, one must consider if placement of a nephrostomy tube, at the original presentation requiring intervention, may have resulted in a better outcome. Additionally, this case emphasizes the importance for proper communication regarding patient education about the difference between short and long-term interventions, as this may have prevented the loss to follow-up for 2 years.

Regarding the infection, \( E. \text{coli} \) is a common cause of gram-negative sepsis related to urinary infections and previous studies have shown that early IV antibiotic treatment alone was sufficient to resolve 89% of abscesses. Despite a normal immunologic work-up, multiple antibiotics, percutaneous drains, and nephrectomy, this patient struggled to clear the rapidly-forming, extensive pan-sensitive \( E. \text{coli} \) infection. This is in contrast to previous literature, in which patients did not require open drainage or nephrectomy. It remains unclear why this infection had such severe complications. Although the current literature argues
against percutaneous drainage as initial management, perhaps earlier, more aggressive interventions with concurrent antibiotic therapy could have reduced the severity of complications seen in this case.

Conclusion

This case outlines a rare and life-threatening complication following the removal of a two-year-old ureteral stent and highlights the importance of proper management and follow-up of UPJO in pediatric patients. These complications may have been avoided if a nephrostomy tube was placed at initial presentation, followed by surgical correction. In the case of severe ureteral stent encrustation, it is prudent to evaluate a combination of endourologic approaches to avoid severe morbidity. Additionally, the extent and severity of infection caused by pan-sensitive *E. coli* in an immunocompetent patient is a novel finding. Further research is necessary to establish clear guidelines in management of severe renal and perinephric abscesses, which may require earlier, more aggressive interventions.

Consent

Informed consent was provided by the parent/guardian of the patient.

Declaration of competing interest

No competing financial interests exist.

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