



ACUTE LEFT PYELONEPHRITIS IN PATIENT WITH BILATERAL LOW BACK PAIN AND URETERAL DUPLICITY: CASE REPORT

PIELONEFRITIS AGUDA IZQUIERDA EN PACIENTE CON LUMBALGIA BILATERAL Y DUPLICIDAD URETERAL: CASO CLÍNICO

Manuel Flores Sáenz ^{1,2}

ABSTRACT

The case presents a 46-year-old woman with left acute pyelonephritis and bilateral duplicated ureters. Acute pyelonephritis is a severe urinary tract infection that can vary in clinical presentation, from mild symptoms to sepsis. Lower back pain is a common symptom and can be unilateral or bilateral. Duplicated ureters are a congenital anomaly resulting in the transport of urine from the same kidney to the bladder, and can cause complications such as vesicoureteral reflux and ureteral obstruction. Treatment involved antibiotics and outpatient urology follow-up. The case underscores the importance of a meticulous diagnostic approach and consideration of underlying congenital anomalies that can complicate clinical management and treatment. The integration of clinical findings and complementary tests was essential for an accurate diagnosis and appropriate treatment plan.

Keywords: pyelonephritis; vesico-ureteral reflux; ureteral obstruction; low back pain. (Source: MESH-NLM)

RESUMEN

El caso es de una mujer de 46 años con pielonefritis aguda izquierda y duplicidad ureteral bilateral. La pielonefritis aguda es una infección grave del tracto urinario que puede variar en su presentación clínica, desde síntomas leves hasta sepsis. El dolor lumbar es un síntoma común en la pielonefritis aguda, y puede presentarse de forma unilateral o bilateral. La duplicidad ureteral es una anomalía congénita que resulta en uréteres que transportan la orina desde el mismo riñón hasta la vejiga, y puede causar complicaciones como reflujo vesicoureteral y obstrucción ureteral. El tratamiento incluyó antibióticos y control ambulatorio en consulta de Urología. El caso destaca la importancia de un enfoque diagnóstico meticuloso y la consideración de anomalías congénitas subyacentes que pueden complicar el cuadro clínico y el tratamiento. La integración de hallazgos clínicos, análisis de laboratorio y pruebas de imagen fue fundamental para el diagnóstico preciso y el plan de tratamiento adecuado.

Palabras clave: Pielonefritis, reflujo vesicoureteral, obstrucción ureteral, dolor de la región lumbar (Fuente: DeCS-BIREME).

¹ Faculty of Medicine and Health Sciences, University of Alcalá. Madrid. Spain.

² Graduate in Medicine, PhD Candidate in Health Sciences.

Cite as: Flores Sáenz M. Acute Left Pyelonephritis in Patient with Bilateral Low Back Pain and Ureteral Duplicity: Case Report. Rev Fac Med Hum. 2024;24(2):185-188. [doi:10.25176/RFMH.v24i2.6188](https://doi.org/10.25176/RFMH.v24i2.6188)

Journal home page: <http://revistas.urp.edu.pe/index.php/RFMH>

Article published by the Journal of the Faculty of Human Medicine of the Ricardo Palma University. It is an open access article, distributed under the terms of the Creative Commons License: Creative Commons Attribution 4.0 International, CC BY 4.0 (<https://creativecommons.org/licenses/by/4.0/>), which allows non-commercial use, distribution and reproduction in any medium, provided that the original work is duly cited. For commercial use, please contact revista.medicina@urp.edu.pe





INTRODUCTION

Acute pyelonephritis is a severe infection of the urinary tract that affects the renal pelvis and parenchyma. The clinical presentation can vary from mild symptoms, such as dysuria, to sepsis due to Gram-negative bacilli. Approximately 20% of patients do not exhibit urinary symptoms, and some may not have a fever. The diagnosis of pyelonephritis is confirmed by urine culture, and in approximately 80% of patients with pyelonephritis, the colony count is greater than 100,000 CFU/mL⁽¹⁾.

Low back pain is a common symptom in acute pyelonephritis and can be unilateral or bilateral⁽²⁾. In patients with bilateral low back pain, acute pyelonephritis presents unique diagnostic and therapeutic challenges. Ureteral duplication is a congenital anomaly where two ureters carry urine from the same kidney to the bladder. This condition can be complete, with two entirely separate ureters, or incomplete, with two ureters that join before reaching the bladder⁽³⁾. Complications of ureteral duplication can include vesicoureteral reflux, ureteral obstruction, or ectopic ureteral insertion⁽⁴⁾.

In patients with acute pyelonephritis, bilateral low back pain, and ureteral duplication, clinical management can be particularly challenging. Bilateral low back pain can be a symptom of both acute pyelonephritis and ureteral duplication, complicating the diagnosis. Additionally, ureteral duplication can increase the risk of complications from acute pyelonephritis, such as vesicoureteral reflux and ureteral obstruction⁽⁵⁾. Treatment of acute pyelonephritis generally involves antibiotics. Clinical follow-up with urine culture seven to fourteen days after the end of antibiotic treatment may be necessary. In cases of recurrent pyelonephritis, suppressive antibiotic treatment may be considered⁽¹⁾.

This case involves a 46-year-old female patient who presented to the emergency room with a temperature of 38.7°C, bilateral lumbar pain, malodorous urine, mild abdominal pain, dysuria, and nausea. Physical examination revealed bilateral ureteral duplication. Laboratory tests showed a left shift, and urinalysis indicated the presence of leukocytes, bacteriuria, and moderate pyuria, suggesting a urinary tract infection (UTI). Imaging confirmed the diagnosis of acute left-sided pyelonephritis and ureteral duplication. The patient was treated with antibiotics and scheduled for

follow-up at the Urology clinic. Pyelonephritis is a urinary infection defined by the presence of pathogens in the urine, typically bacteria, and occasionally fungi or viruses. When the kidney is affected, it is termed acute pyelonephritis, characterized by fever⁽⁶⁾, chills, lumbar pain, and malaise, accompanied by significant bacteriuria⁽⁷⁾. In some cases, pyelonephritis can progress slowly, causing significant renal damage leading to serious renal function disorders or high blood pressure⁽⁸⁾. Once these lesions appear, they are irreversible, underscoring the importance of early diagnosis of chronic pyelonephritis.

Ureteral duplication is the most common congenital urinary tract anomaly, with an incidence of one in every 125 live births⁽⁵⁾. It is more frequent in females (2:1 ratio), and the unilateral form is six times more common than the bilateral form. Duplicated ureters can be associated with vesicoureteral reflux and other physiopathological considerations. Comprehensive management of this patient required the integration of clinical findings, laboratory analysis, and imaging tests to achieve an accurate diagnosis and appropriate treatment plan⁽⁴⁾. The objective of this report is to describe the clinical presentation, diagnosis, and management of a patient with acute pyelonephritis complicated by bilateral low back pain and ureteral duplication.

CASE REPORT

The case presents a 46-year-old female patient who came to the emergency room with a temperature of 38.7°C (311.85 K), bilateral lower back pain that had started the day before, foul-smelling urine for the past two days, mild morning abdominal pain, dysuria, and nausea. She denied having a fever and the possibility of pregnancy. The patient has no history of high blood pressure, diabetes, or hypercholesterolemia. However, she has a history of bilateral ureteral duplication with left reflux and has had two episodes of perianal fistula. She has also had asymptomatic UTIs, with the last positive urine culture in December 2015 for *Escherichia coli* and *Enterococcus*, both sensitive to Ciprofloxacin. On physical examination, the patient appeared well, was alert and oriented, well-hydrated, and had a regular pulse. She was eupneic at rest. Her abdomen was soft and depressible, painless without signs of peritoneal irritation, masses, or enlargement, and with a positive bilateral kidney punch (greater on the left).





Her extremities showed no edema or signs of deep vein thrombosis. She had tenderness on palpation of the paravertebral lumbar muscles. Several tests were performed, including a complete blood count, coagulation tests, serum biochemistry, and a basic urinalysis. An abdominal X-ray, an urgent kidney ultrasound, and an intravenous urography were also performed. The white blood cell count in the blood test was slightly elevated (11.02/ μ L) and it also revealed a left shift, which may indicate an immune response to an infection. Hemoglobin, hematocrit, and platelet levels were within normal ranges. Coagulation times [Activated Partial Thromboplastin Clotting Time (APTT), prothrombin time, and international normalized ratio (INR)] and prothrombin activity were also within normal limits. In serum biochemistry, all values were within normal ranges, indicating normal kidney function and electrolyte balance. In the urine analysis, the presence of 500 white blood cells/ μ L and 200 mg/dL of proteinuria suggested a UTI. The presence of moderate bacteriuria and moderate pyuria also supported this diagnosis.

The abdominal X-ray did not show any calcium density images, which could indicate the presence of kidney stones. However, phleboliths were observed in the upper pelvis, which are small calcium masses that form in the veins. The kidney ultrasound showed a normal-sized right kidney and a larger-than-normal left kidney with a double pyelocaliceal system, a congenital anomaly in which the kidney has two urine collection systems instead of one. There were no signs of kidney stones or perirenal changes. An anechoic image was observed in the distal left ureter, which could indicate ureteral dilation. The bladder was full and contained some echoes, which could be related to debris. The intravenous urography showed asymmetry in kidney size, with the left kidney larger than the right. Both kidneys showed good contrast uptake and elimination. The left kidney showed dilation of the calyceal and infundibular systems and a duplicated pyeloureteral system, an anomaly in which there are two ureters or parts of the ureter instead of one. The cause of the calyceal infundibulum dilation was not visualized.

On the left side, there was dilation of the calyceal systems with probable kidney malrotation. The left ureter was single and slightly dilated distally. The bladder was distended and showed no alterations. The primary diagnosis was acute left pyelonephritis

with a secondary diagnosis of probable left vesicoureteral reflux. The standard diagnostic test for pyelonephritis is urine culture, which was positive for *Escherichia coli*. The antibiogram showed sensitivity to amoxicillin-clavulanic acid, so treatment was initiated for the patient's episode. Treatment included amoxicillin/clavulanic acid 1 g/200 mg orally every eight hours for 14 days, paracetamol 1 g orally every eight hours if needed, ibuprofen 600 mg orally every eight hours for four or five days if needed, alternating with paracetamol, and omeprazole orally once a day for 14 days. An appointment was scheduled for a Urology outpatient visit. A high fluid intake was recommended, and it was indicated that if the fever exceeded 38°C (311.15 K) after 48 hours of antibiotic treatment⁽⁹⁾, the patient should return to the emergency room

DISCUSSION

Acute pyelonephritis is a pathological condition that can present with a wide clinical spectrum, from mild symptoms to severe conditions such as sepsis^(4,10). Despite urine culture being the gold standard for diagnosis, the variability in clinical presentation can hinder early identification of the disease, especially in the absence of urinary symptoms or fever, which occurs in approximately 20% of cases. Ureteral duplication, a common congenital anomaly, can predispose individuals to complications such as vesicoureteral reflux and ureteral obstruction, further complicating the picture of pyelonephritis. Although ureteral duplication is not commonly reported as a condition that increases the risk of complicated infection, in this case, the patient presented with recurrent UTIs, suggesting a potential relationship between the congenital anomaly and an increased risk of infectious complications. The incidence of this anomaly is one in 125 live births, being more common in women and presenting unilaterally more frequently than bilaterally. In this case, the patient presented with bilateral lower back pain, a symptom that can be attributed to both pyelonephritis and ureteral duplication, emphasizing the importance of a meticulous diagnostic approach that includes laboratory analysis and imaging. The complete blood count revealed leukocytosis with a left shift, suggesting an active immune response to a bacterial infection, consistent with the diagnosis of acute pyelonephritis. The management of acute pyelonephritis generally includes antibiotics, and in this case, clinical follow-up with urine culture and outpatient monitoring in urology was chosen.

The limitations in managing this case include the difficulty in establishing a differential diagnosis due to the overlap of symptoms between pyelonephritis and complications of ureteral duplication. An imaging study with contrasted urotem is recommended to confirm the presence of acute pyelonephritis, especially in patients with anatomical anomalies such as ureteral duplication. Additionally, the presence of a congenital anomaly like ureteral duplication may require a more complex therapeutic approach and prolonged follow-up.

The conclusions of this case are justified by the correlation between clinical, laboratory, and imaging findings, which confirmed the diagnosis of left acute pyelonephritis in the context of bilateral ureteral duplication. It is important to discuss the necessity of performing ultrasounds and other imaging studies in cases of UTIs to identify anatomical anomalies and guide treatment. Additionally, consideration should be given to whether the antibiotic treatment administered

was the most appropriate according to clinical practice guidelines. The favorable response to antibiotic treatment and the follow-up recommendations reinforce the appropriateness of clinical management. The main lessons from this case report include the need for a high index of suspicion for pyelonephritis in patients with lower back pain, even in the absence of classic urinary symptoms, and the importance of considering underlying congenital anomalies that can complicate the clinical picture and treatment. This case also highlights the relevance of an interdisciplinary approach to managing complex urological conditions.

CONCLUSION

This case underscores the importance of considering underlying congenital anomalies such as ureteral duplication in patients with acute pyelonephritis, even in the absence of classic urinary symptoms. Accurate diagnosis and effective treatment require a thorough integration of clinical, laboratory, and imaging findings.

Authorship contribution: MFS participated in the conceptualization, research, methodology, and writing and review of the original draft.

Funding: Self-funded.

Conflict of interest: The author declares that he has no conflict of interest.

Received: March 15, 2024.

Approved: April 29, 2024.

Correspondence: Manuel Flores Sáenz.

Address: Campus Universitario - C/ 19, Av. de Madrid, Km 33,600, 28871 Alcalá de Henares, Madrid, Spain

Telephone: (+34) 918855839

Email: manuel.flores@uah.es

REFERENCES

Nemirovsky C, López Furst MJ, Pryluka D, De Vedia L, Scapellato P, Colque A, et al. Consenso Argentino intersociedades de Infección Urinaria 2018-2019 - Parte I. *Medicina (Buenos Aires)*. 2020;80(3):229-40. Available at: http://www.scielo.org.ar/scielo.php?script=sci_arttext&pid=S0025-76802020000400006

2.Andreu A, Cacho J, Coira A, Lepe JA. Diagnóstico microbiológico de las infecciones del tracto urinario. *Enfermedades Infecciosas y Microbiología Clínica*. 2011;29(1):52-7. doi:10.1016/j.eimc.2010.06.008

3.Fonseca RR, Covita A, Mota RL. Ureteral duplication with an heterotopic ureteric implantation: a less common cause of adult urinary incontinence. *BMJ Case Rep*. 2021;14(2):e239572. doi:10.1136/bcr-2020-239572

4.Herness J, Buttolph A, Hammer NC. Acute Pyelonephritis in Adults: Rapid Evidence Review. *Am Fam Physician*. 2020;102(3):173-80. Available at: <https://pubmed.ncbi.nlm.nih.gov/32735433/>

5.Editor. *Medicina General y de Familia*. 2017 [citado 18 de diciembre de 2023]. Duplicidad ureteral completa, bilateral, asociada a litiasis. doi:10.24038/mgyf.2017.024

6.Sabih A, Leslie SW. Complicated Urinary Tract Infections. En: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 [citado 18 de diciembre de 2023]. Available at: <http://www.ncbi.nlm.nih.gov/books/NBK436013/>

7.Acute complicated urinary tract infection (including pyelonephritis) in adults and adolescents - UpToDate [Internet]. [citado 18 de diciembre de 2023]. Available at: <https://www.uptodate.com/contents/acute-complicated-urinary-tract-infection-including-pyelonephritis-in-adults-and-adolescents>

8.Belyayeva M, Jeong JM. Acute Pyelonephritis. En: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 [citado 18 de diciembre de 2023]. Available at: <http://www.ncbi.nlm.nih.gov/books/NBK519537/>

9.Serrano C, Fernández R, Yanes J, Santos JM, Taboada S, García C, et al. Infecciones urinarias del tracto inferior en adultos. *Guía Terapéutica Interniveles del Área Aljarafe* [Internet]. 3.ª ed. Sevilla: Distrito de Atención Primaria Aljarafe. SAS; 2019. Available at: <https://www.aeu.es/UserFiles/files/PROTOCOLO%20TTO%20ITU%20AEU%209mayo22.pdf>

10.Castaigne J, Georges B, Jouret F. [Acute pyelonephritis]. *Rev Med Liege*. 2022;77(9):544-7. Available at: <https://pubmed.ncbi.nlm.nih.gov/36082603/>