World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(CASE REPORT)

Check for updates

Acute pyelonephritis on a single ectopic kidney revealing newly diagnosed diabetes: A case report

Oussama Elgharnati [1,*], Ikram Damoune [1,2] and Abdelmjid Chraibi [1,2]

[1] *Department of Endocrinology and Metabolic Diseases, CHU Agadir, Morocco.*
[2] *Laboratory of Kidneys, Endocrinology, Gastroenterology, Neurosciences, and Ethics (REGNE), Faculty of Medicine, University Ibn Zohr, Agadir, MAR.*

World Journal of Advanced Research and Reviews, 2025, 25(02), 034-036

Publication history: Received on 22 December 2024; revised on 31 January 2025; accepted on 02 February 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.25.2.0326

Abstract

We report the case of a 62-year-old male presenting with polyuria-polydipsia syndrome and acute abdominal pain. The diagnosis of diabetic ketoacidosis complicated by acute pyelonephritis on a single ectopic kidney was confirmed through biological, radiological, and bacteriological assessments, with *Escherichia coli* identified as the causal pathogen. Insulin therapy and targeted antibiotic treatment led to a favorable outcome. This case highlights the importance of early diagnosis and prompt management of urinary tract infections in diabetic patients with renal anatomical anomalies.

Keywords: Diabetes; Ectopic Kidney; Pyelonephritis; Diabetic Ketoacidosis; *Escherichia coli*

1. Introduction

Diabetes mellitus is a global health challenge, affecting over 500 million individuals worldwide, with a prevalence expected to rise in the coming decades. One of the less recognized but clinically significant complications of diabetes is its impact on the urinary tract. Diabetic patients are at a 2-4 times higher risk of developing urinary tract infections (UTIs) compared to the general population, primarily due to chronic hyperglycemia impairing immune defenses.

Anatomical or functional abnormalities of the urinary system further exacerbate this risk. Ectopic kidneys, a rare congenital anomaly, are estimated to occur in 1 out of 900 births and may predispose individuals to urinary stasis, recurrent infections, and impaired renal function. These factors compound the complexity of managing UTIs in diabetic patients.

Although rare, the combination of diabetes, ectopic kidney, and acute pyelonephritis presents unique challenges in diagnosis and treatment. This case highlights the critical role of imaging, multidisciplinary management, and early intervention in optimizing outcomes for such patients.

2. Case Presentation

A 62-year-old male with no significant prior medical history presented to the emergency department with a three-day history of polyuria, polydipsia, and acute abdominal pain accompanied by vomiting and fever (38.5 °C).

* Corresponding author: O Elgharnati

Copyright © 2025 Author(s) retain the copyright of this article. This article is published under the terms of the Creative Commons Attribution Liscense 4.0.

3. Clinical Examination

The patient appeared dehydrated with polypnea (26 breaths/min) and significant tenderness in the right iliac fossa, without guarding or rebound tenderness. Capillary blood glucose was measured at 4.5 g/L, and urinalysis revealed glucosuria and ketonuria (+++).

Laboratory investigations show a glycated hemoglobin (HbA1c) level of 10.7%, a white blood cell count of 21,900/mm^3 with neutrophilic predominance, a C-reactive protein (CRP) level of 192 mg/L, and normal renal function. Bicarbonate levels are decreased at 16 mmol/L, and urine culture reveals the growth of Escherichia coli.

Abdominal ultrasonography revealed a single pelvic kidney. This was confirmed by a CT scan, which demonstrated an ectopic kidney with characteristic features of acute pyelonephritis, including cortical hypodensity and perinephric fat stranding ("Figure 1").

The patient received insulin therapy for diabetic ketoacidosis and was initiated on empiric broad-spectrum antibiotics (ceftriaxone and ciprofloxacin). Antibiotics were adjusted based on culture sensitivity results. The patient showed rapid clinical improvement with normalization of metabolic parameters and resolution of symptoms within five days.

4. Discussion

UTIs are a common complication in diabetic patients due to chronic hyperglycemia impairing neutrophil function, reducing chemotaxis, and promoting microbial proliferation. *Escherichia coli* remains the most common pathogen, accounting for over 50% of cases.

This case is noteworthy due to the involvement of a single ectopic kidney, an anomaly that increases susceptibility to infections due to urinary stasis and impaired drainage. Although ectopic kidneys are often asymptomatic, their anatomical position predisposes them to recurrent infections, calculi, and hydronephrosis.

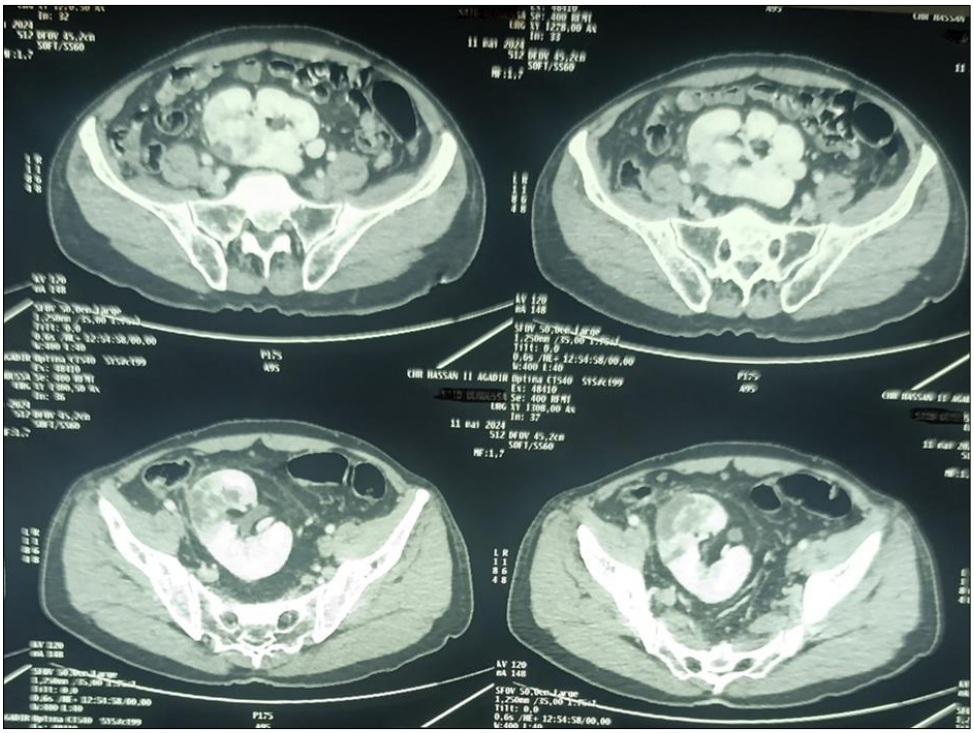

Figure 1 CT image of the abdomen showing a single ectopic kidney in the pelvic position with a hypodense area suggesting acute pyelonephritis

Imaging plays a critical role in diagnosing pyelonephritis in patients with anatomical abnormalities. While ultrasound can detect gross anomalies, CT scans provide detailed anatomical and pathological information. In this case, imaging confirmed the kidney's ectopic position and revealed acute pyelonephritis, guiding appropriate management.

Early diagnosis and prompt treatment are critical to prevent complications such as renal abscess, sepsis, or permanent renal damage. The combination of insulin therapy and targeted antibiotics, as demonstrated in this case, highlights the importance of a multidisciplinary approach involving endocrinologists, radiologists, and infectious disease specialists.

Studies have shown that diabetic patients with renal anomalies have a higher risk of complications from UTIs, including systemic infections and chronic kidney disease. This case aligns with these findings and underscores the importance of vigilance in managing such patients.

5. Conclusion

Diabetes, combined with anatomical abnormalities such as a single ectopic kidney, increases the risk of severe infections that can rapidly compromise renal function. Prevention relies on strict monitoring and early treatment of urinary tract infections in these patients. This case illustrates the importance of a multidisciplinary approach and systematic use of imaging to optimize patient care.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Bonadio M, Costarelli S, Morelli G, Tartaglia T. The influence of diabetes mellitus on the spectrum of uropathogens and the antimicrobial resistance in elderly adult patients with urinary tract infection. BMC Infect Dis. 2006;6:54. doi:10.1186/1471-2334-6-54.

[2] Hoepelman AI, Meiland R, Geerlings SE. Pathogenesis and management of bacterial urinary tract infections in adult patients with diabetes mellitus. Int J Antimicrob Agents. 2003;22(Suppl):S35-S43.

[3] Forbes JM, Cooper ME. Mechanisms of diabetic complications. Physiol Rev. 2013;93(1):137-88. doi:10.1152/physrev.00045.2011.

[4] Geerlings SE, Hoepelman AI. Immune dysfunction in patients with diabetes mellitus (DM). FEMS Immunol Med Microbiol. 1999;26(3-4):259-65. doi:10.1111/j.1574-695X.1999.tb01397.x.

[5] Hakeem L, Bhattacharyya D. The prevalence of pyelonephritis in diabetes mellitus: A systematic review and meta-analysis. Int Urol Nephrol. 2020;52(6):1007-15. doi:10.1007/s11255-019-02189-y.

[6] Shah BR, Hux JE. Quantifying the risk of infectious diseases for people with diabetes. Diabetes Care. 2003;26(2):510-3. doi:10.2337/diacare.26.2.510.

[7] Kofteridis DP, Papadimitraki E, Mantadakis E, et al. Effect of diabetes mellitus on the clinical and microbiological features of hospitalized elderly patients with acute pyelonephritis. J Am Geriatr Soc. 2009;57(11):2125-8. doi:10.1111/j.1532-5415.2009.02499.x.

[8] Scholes D, Hooton TM, Roberts PL, Stapleton AE, Gupta K, Stamm WE. Risk factors for recurrent urinary tract infection in young women. J Infect Dis. 2000;182(4):1177-82. doi:10.1086/315827.