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No; it's not hydronephrosis - it is pseudohydronephrosis!

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Abstract
Bilateral hydronephrosis usually implies the presence of clinically relevant obstructive uropathy and renal ultrasound is often utilized for this non-invasive and easily available diagnostic step. On the other hand, pseudohydronephrosis, defined as renal imaging characteristics that mimic obstructive uropathy without obstructive pathology, has only been very scantily reported. Pseudohydronephrosis was first described in 1949. The misdiagnosis of true hydronephrosis in such scenarios raises the specter of unnecessary, expensive, invasive, and potentially dangerous investigations and procedures. We describe herein bilateral renal cysts mimicking bilateral hydronephrosis. Physician caution is warranted.
Keywords: Pseudohydronephrosis, Hydronephrosis, Acute kidney injury, Renal ultrasound
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Introduction

Bilateral hydronephrosis remains the sine qua non diagnostic criterion for clinically relevant obstructive uropathy. Therefore, renal ultrasound examination is often utilized for this non-invasive and easily available diagnostic step, again without radiation exposure. Conversely, pseudohydronephrosis, which is defined as renal imaging characteristics that mimic obstructive uropathy without obstructive pathology, has only been very scantily reported (1,2). To our knowledge, pseudohydronephrosis, very rarely reported, was first described in 1949 (3). The misdiagnosis of true hydronephrosis in such scenarios raises the specter of unnecessary, expensive, invasive, and potentially dangerous investigations and procedures.

Case Report

An 80-year-old male with a past medical history of coronary artery stent in 2005 was diagnosed in November 2022 with biopsy-proven pure red cell aplasia and was started on Cyclosporine 3 mg/kg BID with prednisone 25 mg/day. He was admitted two months later with HSV1-positive facial and oral lesions, and he was started on valacyclovir 1000 mg BID. He had no urinary or systemic symptoms. Vital signs were stable. Serum creatinine that was 1.58 mg/dL in October 2022 had increased to 1.81 mg/dL on admission, together with associated hyperkalemia, 5.7 mmol/L. Trough cyclosporine level was acceptable at 169 ng/mL. Bactrim, lisinopril, and atorvastatin were withheld. Renal sonogram was interpreted as bilateral moderate hydronephrosis (Figure 1).

On further review of the renal ultrasound images following a urology consultation, and due to the absence of bilateral hydroureters on the renal sonogram images, the possibility of pseudohydronephrosis was entertained. A contrast-enhanced CT (computed tomography) scan demonstrated cortical atrophy and multiple bilateral renal sinus cysts, but otherwise no urinary obstruction (Figure 2).

The multiple bilateral renal sinus cysts had given the appearance of bilateral hydronephrosis on the initial interpretation of the renal sonogram. Serum creatinine, one week later, had improved to 1.61 mg/dL, and potassium was 5.1 mmol/L. The patient was sent home with a discharge diagnosis of pseudohydronephrosis and resolving acute kidney injury likely related to concurrent angiotensin-converting enzyme inhibition and exposure to trimethoprim-sulfamethoxazole (Bactrim). Follow-up chemistry was planned in about two weeks with outpatient follow-up with the primary care provider.

Discussion

To our knowledge, pseudohydronephrosis, very rarely reported, was first described in 1949 (3). The risk of unnecessary, expensive, invasive, and potentially dangerous investigations and procedures remains a significant concern. The absence of hydroureters concurrent with the appearance of bilateral hydronephrosis on the renal sonogram should have raised the possibility

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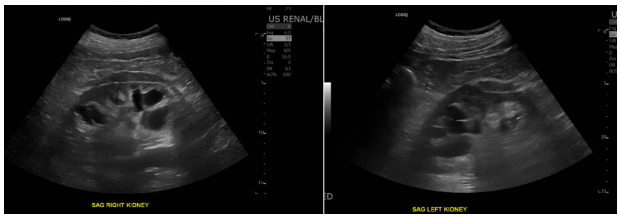

Figure 1. Renal sonogram was interpreted as bilateral moderate hydronephrosis (no magnification).

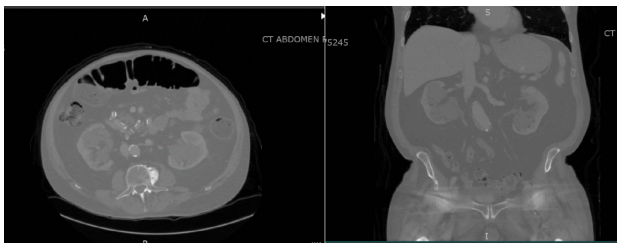

Figure 2. A contrast-enhanced CT scan demonstrated cortical atrophy and multiple bilateral renal sinus cysts, but otherwise no urinary obstruction (no magnification).

that what was observed and initially interpreted on the renal sonogram as bilateral hydronephrosis may not be what it appeared to be. The treating physician must always consider other differential diagnoses of rising creatinine. Here, the absence of bilateral hydroureters was strongly indicative of some misinterpretation, and this notion was confirmed with the contrast-enhanced CT examination. Kidney function improved following hydration and the withdrawal of Bactrim, lisinopril, and atorvastatin without any intervention. This was not a case of bilateral hydronephrosis. It was not obstructive uropathy – it was pseudohydronephrosis!

Conclusion

Pseudohydronephrosis, defined as renal imaging characteristics that mimic obstructive uropathy without obstructive pathology, has only been very scantily reported and was first described in 1949. The misdiagnosis of true hydronephrosis when it is not present, raises the specter of unnecessary, expensive, invasive, and potentially dangerous investigations and procedures. Physician caution is warranted.

Implication for health policy/practice/research/medical education

Bilateral hydronephrosis remains the sine qua non diagnostic criterion for clinically relevant obstructive uropathy. Therefore, renal ultrasound is often utilized for this non-invasive and easily available diagnostic step. Conversely, pseudohydronephrosis, defined as renal imaging characteristics that mimic obstructive uropathy without obstructive pathology, has only been very scantily reported. To our knowledge, pseudohydronephrosis was first described in 1949. The misdiagnosis of true hydronephrosis in such scenarios raises the specter of unnecessary, expensive, invasive, and potentially dangerous investigations and procedures.

Acknowledgments

This manuscript is dedicated to my late mother, Madam Gladys Chinyelu Onuigbo, who departed this earth on Tuesday, February 21, 2023. She was a loving mother.

Conflicts of interest

The author declares no competing interests.

Ethical issues

This case report was conducted in accordance with the principles outlined in the World Medical Association Declaration of Helsinki. Written informed consent was obtained from the patient for the publication of this case report. Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the author.

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