Pielonefrite Enfisematosa Bilateral: Um Diagnóstico Incomum

Bilateral Emphysematous Pyelonephritis: An Uncommon Diagnosis

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Resumo:

A pielonefrite enfisematosa, uma forma rara de pielonefrite com elevada taxa de mortalidade, define-se como uma infeção renal aguda necrotizante, causada por agentes patogénicos formadores de gás.

Os autores descrevem o caso de uma doente adulta admitida por pielonefrite enfisematosa bilateral. O quadro clínico deteriorou-se rapidamente sob tratamento conservador, havendo necessidade de iniciar suporte multiorgânico invasivo, incluindo técnica contínua de substituição renal, posteriormente, nefrectomia bilateral urgente.

Este caso realça a importância do diagnóstico diferencial e da pesquisa de diagnósticos incomuns que podem ser potencialmente fatais. Para além da monitorização e do início de tratamento precoce, a abordagem multidisciplinar é fundamental para alcançar os melhores resultados possíveis.

Palavras-chave: Lesão Renal Aguda; Nefrectomia; Pielonefrite.

Abstract:

Emphysematous pyelonephritis is a rare entity with a high mortality rate, consisting of an acute necrotising renal infection caused by gas-forming pathogens.

The authors report the case of an adult female with bilateral emphysematous pyelonephritis. She deteriorated quickly under conservative treatment, requiring multiple organ support, including continuous renal replacement therapy, and urgent bilateral nephrectomy.

This case highlights the importance of pursuing uncommon but potentially deadly diagnoses. In addition to early monitoring and aggressive treatment, a multidisciplinary approach is crucial to achieving the best outcome possible.

Keywords: *Acute Kidney Injury; Nephrectomy; Pyelonephritis.*

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Case Report

A 47-year-old female with unmedicated arterial hypertension and poorly controlled type 2 diabetes (haemoglobin A1c 7.6%) presented to the emergency room after being found disoriented and lethargic on that day. She also had unspecified mild abdominal pain the week before.

On admission, although afebrile, she was hypotensive (blood pressure 98/66 mmHg), tachycardic (heat rate 128 bpm) and tachypnoeic (30 breaths per minute), with no other remarkable findings.

Initial arterial blood gas analysis revealed a normochloremic metabolic acidosis (pH 7.36, bicarbonate 10.2 mmol/L, anion gap 23), associated with hyperlacticaemia (7.8 mmol/L) and hyperglycaemia (>685 mg/dL).

Blood tests revealed ketonemia (1.3 mmol/L), increased inflammatory parameters (C-reactive protein of 484 mg/L), lymphopenia (0.46 x 109/L), thrombocytopenia (56.000 x 109/L) and AKIN 3 acute kidney injury (urea 124 mg/dL and creatinine 5.1 mg/dL), associated with hyponatremia (glucose corrected sodium 129 mmol/L). Urinary sediment study showed glycosuria (250 mg/dL), proteinuria (300 mg/dL), and leukocyturia (70 leucocytes/µL); nitrite test was negative. She was initially diagnosed with diabetic ketoacidosis and started intravenous fluids and insulin perfusion. Despite that, the patient remained oliguric. A subsequent computed tomography (CT) abdominal scan showed enlarged kidneys with loss of corticomedullary differentiation and extensive bilateral gaseous areas (Fig. 1), compatible with bilateral emphysematous pyelonephritis.

After blood and urine culture samples were collected, intravenous antibiotics were started (ceftriaxone 2 g daily) and the patient was admitted to the intensive care unit. Despite all efforts, the patient evolved quickly to septic shock with multiple organ dysfunction, requiring mechanical ventilation, inotropes and continuous renal replacement therapy. On the third day, an abdominal CT scan re-evaluation was performed (about 50 hours after the first one), revealing an increase in parenchymal destruction, as well as an extrarenal extension of the gaseous collections and delayed contrast excretion (absent at 7 minutes post-injection) (Figs. 2. A and B).

Blood and urine cultures were both positive for *Escherichia coli* with extended-spectrum beta-lactamases (ESBL) and antibiotic therapy was escalated from ceftriaxone to ertapenem, according to the sensitivity report provided by the

Figure 1: CT abdominal scan showing extensive gas areas in both kidneys.

microbiologist in charge. The case was discussed daily with Urology, and by the fourth day, due to clinical deterioration, the patient was submitted to an urgent bilateral nephrectomy. Afterwards, she completed 14 days of effective antibiotic therapy following source control and had a steady and favourable evolution. She was discharged after 29 days at the hospital and was integrated into a haemodialysis clinic.

Discussion

Emphysematous pyelonephritis is an acute necrotising parenchymal and perirenal infection caused by gas-forming pathogens, such as *Escherichia coli.*[1-4] It is an uncommon form of pyelonephritis, more frequently observed in diabetic patients,[1-4] with a high mortality rate of up to 12.5%-25%.[2,5]

Clinical findings are like other upper urinary tract infections, including fever and flank pain.[1,2,4] Concomitant diabetic ketoacidosis can also happen.[6]

Consequently, diabetic patients presenting with clinical or analytical evidence of infection associated with acute kidney failure should have a renal imaging evaluation, either through ultrasound or CT scan, and emphysematous pyelonephritis should be considered in the initial differential diagnosis and thus excluded.

Various risk factors at admission have been linked to poorer prognosis and rapid clinical deterioration, namely thrombocytopenia, septic shock and altered mental status.[2,4,5]

This illustrates the need for timely treatment with intravenous fluids, glycemia correction and intravenous antibiotics, preferably broad-spectrum, such as a third-generation cephalosporin or a carbapenem if ESBL risk factors exist.[3] Bilateral renal involvement has also been associated with worse clinical presentations in some studies,[1,2,5] although general management is the same as in unilateral cases.[3] No risk factors for bilateral involvement have been defined at the moment.

There is an avid discussion on optimal initial care, between more conservative and minimally invasive therapies, or more invasive options such as radical nephrectomy.[1-5]

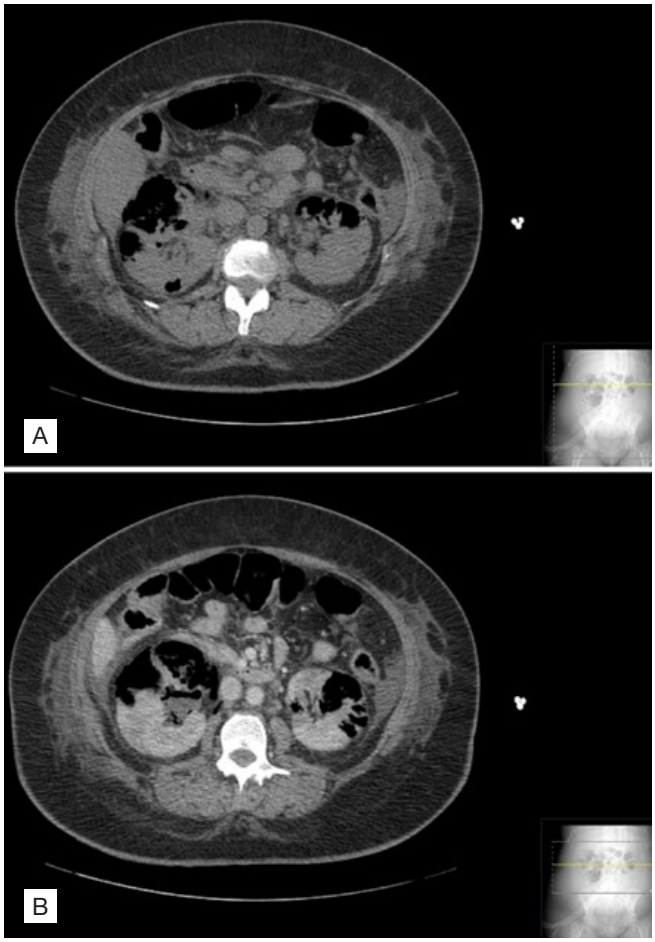

Figure 2 A and B: CT abdominal scan showing enlargement of the bilateral kidney gas areas with perirenal extension and parenchymal destruction.

Initial conservative treatment consisting of antibiotic therapy together with minimally invasive management through percutaneous drainage of gas and purulent fluid can lead to efficient source control with the possibility of some kidney function preservation.[1-3]

Nevertheless, close monitoring is needed as patients can evolve quickly to septic shock. In these rapidly deteriorating patients, a prompt nephrectomy should be performed to source control. Even in circumstances where radical nephrectomy is the first treatment option, its mortality rate is not negligible and in fact, it can be superior compared to more conservative approaches.[2]

In our case, although the patient showed clinical signs of severe infection at admission (namely, altered mental status, septic shock, thrombocytopenia, and bilateral kidney involvement), conservative treatment was chosen in an attempt to minimize renal loss, given the fact that she was a young patient. Since no evidence of renal obstruction was shown in the CT scan, after a multidisciplinary discussion, it was decided to delay minimally invasive management.

However, the patient evolved unfavourably, and the reassessment CT scan showed imagiological deterioration.

After a new multidisciplinary discussion between Urology and the Intensive Care team, it was clear that the invasive approach, consisting of a bilateral nephrectomy, would be the best option for the patient.

In conclusion, emphysematous pyelonephritis is a potentially fatal condition that can lead to rapid clinical degradation. Early recognition and treatment, with close monitoring in an intensive care unit, organ supportive therapy as needed, and daily multidisciplinary discussion with urology and microbiology were fundamental for this patient's favourable outcome.

Invasive management of the infection can vary according to multiple factors, some of them subjective, which elicits an urgent need to define clinical scores to classify disease gravity and standard approach. ■

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RSC – Idealização, redação e revisão do artigo
RPA, MP, JCC, FB – Redação e revisão do artigo
VR – Idealização e revisão do artigo
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