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Inflammation and infection

Emphysematous pyelonephritis caused by candida species: A case report and outcome of 1 year follow-up

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ABSTRACT

Emphysematous pyelonephritis (EPN) is an acute life-threatening gas-forming necrotizing infection of the renal parenchyma and its surrounding tissues. EPN requires early diagnosis and management because of related life-threatening septic complications. Gram-negative bacteria remain the most common causative organisms.

Although candida species as a causative pathogen in emphysematous pyelonephritis is very rare, we report a rare case of emphysematous pyelonephritis caused by candida species successfully managed with unilateral nephrectomy and outcome for flow up in one year.

Introduction

Emphysematous pyelonephritis (EPN) is an acute life-threatening suppurative infection of the renal parenchyma and its surrounding tissues. Mortality from EPN is primarily attributable to septic complications.[1] Mortality ranges 20% to more than 80%. Diabetes mellitus is the most common associated factor up to 95% of patients followed by urinary obstruction. There is a preponderance of EPN in females. Non-contrast abdominal Ct is the gold standard investigation of choice. We present a case of an uncontrolled diabetic female patient diagnosed emphysematous pyelonephritis after Abdominal Ct caused by candida species.

Case report

A 39-years old diabetic female was admitted to the hospital due to high-grade fever, severe left flank pain, nausea; vomiting, dysuria, and chills started 20 days before admission. There was no past medical history. Physical examination revealed ill and toxic patient, confused, hypotensive and tachycardic patient. Tenderness of the left flank was noted on examination. Laboratory results revealed marked leukocytosis (21.98), Thrombocytopenia (77,000), low hemoglobin level (8.1), acute renal failure (3.13) classified as AKI stage 2 and hyperglycemia. Urinalysis revealed marked leukocytosis, hematuria, and glycosuria. Ct of the abdomen showed gas in the left renal parenchyma, perirenal fluid collection and enlarged left kidney (Fig. 1). The contralateral kidney was normal (Fig. 2). The patient was admitted to the ICU, aggressive resuscitation, adequate hydration, good hyperglycemic control, and broad-spectrum antibiotic was initiated. The patient's condition was deteriorated despite conservative treatment and urgent nephrectomy was considered necessary. Urine culture grew candida species and fluconazole infusion was added to the management. The postoperative period was uneventful and the patient's clinical condition was improved remarkably. After 12days hospital stay, the patient was discharged. Follow-up for 1year; the patient remains well and no need for renal replacement therapy.

Discussion

Candida species are a rare cause of emphysematous pyelonephritis. *Escherichia coli* are the most common causative pathogen nearly 69% of the cases followed by Klebsiella (29%).[2] Anaerobic microorganisms' including Candida has been related in rare cases as a causative pathogen. In our case, candida species were isolated in the urine culture.

In a meta-analysis by Falagas et al., seven study cohorts were identified and studied for the risk factors affecting mortality. The presence of diabetes mellitus appeared to be a common risk factor for EPN but, surprisingly, it is not associated with increased mortality. Systolic blood pressure less than 90 mmHg, disturbance of consciousness as well as increase in serum creatinine level were found to be associated with higher mortality.[3] The presence of thrombocytopenia is linked with poor prognosis. It is fascinating to recognize that the presenting case had all the above-mentioned factors but EPN requires early surgical intervention in patients not responding well for conservative management as this

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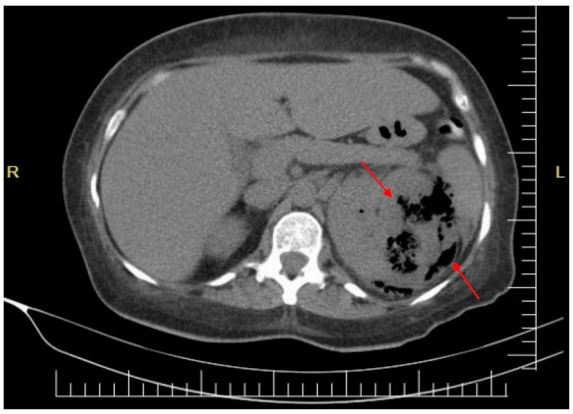

Fig. 1. Gas in the left renal parenchyma, perirenal fluid collection (arrows).

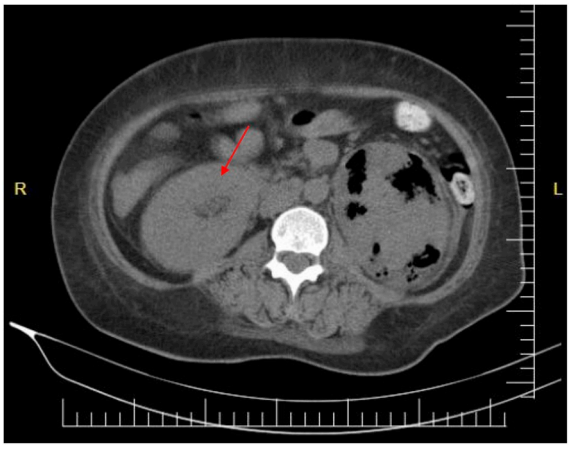

Fig. 2. Normal right kidney (arrow).

increases the survival rate.

Antibiotics can be correlated with culture results once available. In our patient, Candida species were isolated from the culture and fluconazole was initiated. The long-term outcome for renal function and the need for further support will depend on the degree and amount of parenchymal loss and coexisting renal disease.[4] The presenting case has been followed up to 1year with no need for renal support and patient was on good glycemic control that improves the renal function outcome and prevents the pathophysiology of the disease as high level of tissue glucose in association with impaired blood supply to the kidneys, which is prevalent in patients with diabetes, facilitates the process of anaerobic metabolism.

JAMES R. JOHNSON et al. reported a case EPN caused by candida managed nephrectomy alone. The current reporting case receives the antifungal drug. Shokeir reported that immediate nephrectomy, as soon as the patient is medically stable, should not be delayed. Huang JJ et al. reported 48 cases of EPN; the success rate of those who had nephrectomy was 90% (9 of the 10 patients). Estimates of mortality with patients treated medically having higher mortality than those treated surgically, 70% versus 30%, respectively.[5]

Conclusion

We conclude patients not responding to the initial antibiotics should be suspected a rare anaerobic micro-organisms and antibiotics can be correlated with culture results once available. Nephrectomy remains a significantly important factor that improves prognosis and reduces the mortality rate in patients not responding to the medical treatment and percutaneous drainage.

Declaration of competing interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.eucr.2020.101113.

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