

Metachronous Emphysematous Pyelonephritis and Xanthogranulomatous Pyelonephritis in the Contralateral Kidney

An Extremely Rare Condition

Mishari H Alshyarba

Keywords: emphysematous pyelonephritis, xanthogranulomatous pyelonephritis, nephrectomy

Urol J. 2007;4:248-50.
www.uj.unrc.ir

INTRODUCTION

Emphysematous pyelonephritis is an uncommon and severe acute bacterial infection of the kidney. Diagnosis is usually made very late due to changing manifestations and infrequent occurrence. On the other hand, xanthogranulomatous pyelonephritis is a rare severe renal infection which typically results in diffused destruction of the kidney in a chronic course. It has been reported that the peak incidence of the disease is between the 4th and 6th decades of life.⁽¹⁾ Nonfunctioning kidneys in xanthogranulomatous pyelonephritis have been reported in 50% to 70% of cases, and in 22% to 70%, nephrolithiasis has been an associated finding.⁽¹⁾

According to radiological backgrounds, the disease can mimic the features of a renal tumor. Therefore, nephrectomy is the treatment of choice.⁽¹⁾ I report a metachronous occurrence of emphysematous pyelonephritis and xanthogranulomatous pyelonephritis in the contralateral kidney.

CASE REPORT

A Saudi 50-year-old woman with confirmed diagnoses of diabetes mellitus, hypertension, chronic liver disease, and end-stage renal disease (ESRD) was admitted to the emergency room. Her chief complaint was right loin pain and fever for the past 2 weeks. Urinary symptoms were absent. Three years earlier, the diagnosis of atrophic nonfunctioning right kidney had been made for her with a suspicion of left renal tumor (Figure 1). Left partial nephrectomy had been performed and the histological evaluation had turned out to be xanthogranulomatous pyelonephritis (Figure 2). Five months after the operation, the patient was

Department of Surgery, College of Medicine, King Khalid University, Abha, Saudi Arabia

Corresponding Author:
Mishari H Alshyarba, MD
Department of Surgery, College of Medicine, King Khalid University
PO Box: 641, Abha – 61421, Kingdom of Saudi Arabia
Tel: +966 7 224 7800, Ext 2 126
Fax: +966 7 224 7570
E-mail: mhalshyarba@gmail.com

Received April 2007
Accepted August 2007



Figure 1. Nonenhanced CT scan is showing atrophic right kidney and left renal mass in the lower pole.

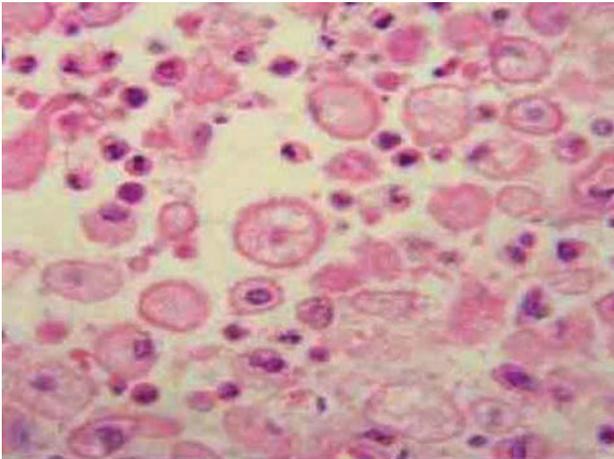


Figure 2. Replacement of renal parenchyma with foamy histiocytes (xanthoma cells) is seen as well as some inflammatory cells (hematoxylin-eosin, $\times 400$).

put on maintenance hemodialysis due to ESRD.

At presentation, she seemed ill and toxic on physical examination. The body temperature and blood pressure of the patient were 38°C and 80/40 mm Hg, respectively. Scar of the previous partial nephrectomy was seen on the abdominal wall and mild tenderness in the right loin was detected. Results of laboratory investigations were as follows: white blood cells, $10.3 \times 10^9/\text{L}$; blood hemoglobin, 10.3 g/dL; and platelet count, $155 \times 10^9/\text{L}$. Serum levels of sodium, potassium, urea, and creatinine were 119 mmol/L, 4.9 mmol/L, 59 mmol/L, and 4.5 mmol/L, respectively. Serum bicarbonate and pH levels were 9 mmol/L and 7.025 (compensated metabolic acidosis), respectively. Urine culture which was repeated twice showed no growth of microorganisms. Abdominal ultrasonography revealed multiple hyperechoic foci in the right kidney suggesting intraparenchymal gas. Nonenhanced computed tomography (CT) of the abdomen showed an enlarged right kidney with intraparenchymal gas extending to the perinephric fat (Figure 3). The left kidney was atrophic with irregular outlines. Hence, the diagnosis of emphysematous pyelonephritis of the right kidney was established. After resuscitation of the patient in the operation room, emergent nephrectomy was performed without any complications. Postoperatively, the patient became normotensive and acidosis was corrected. The patient developed wound infection which was treated with daily dressing and secondary wound closure. Histopathology of the right kidney showed acute pyelonephritis with micro-abscesses. The patient was discharged in a fair condition.

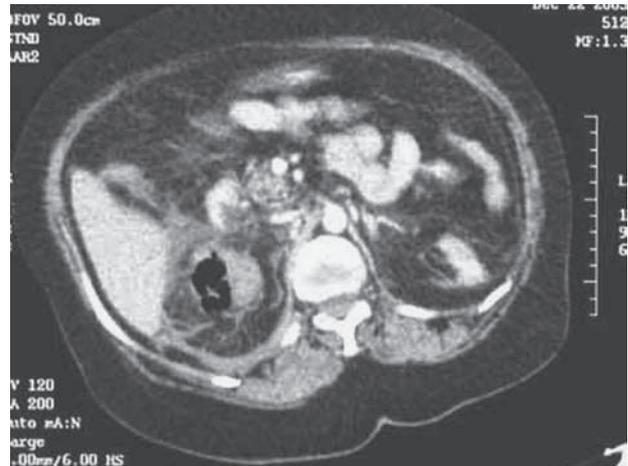


Figure 3. Nonenhanced CT scan of the same patient shows emphysematous pyelonephritis of the right kidney.

DISCUSSION

Emphysematous pyelonephritis and xanthogranulomatous pyelonephritis are rare but severe renal infections. They are accompanied by high rates of morbidity and mortality. They usually present as isolated entities. Very few cases have been reported with the association of emphysematous and xanthogranulomatous pyelonephritis in a same kidney.⁽²⁻⁴⁾ Langdale and colleagues reported the first case of emphysematous pyelonephritis in a xanthogranulomatous kidney in 1988.⁽⁵⁾ The primary factors necessary for the development of emphysematous pyelonephritis are urinary tract infection and a compromised immunity which occur in diabetic patients. Few cases, however, have been reported in nondiabetic patients who were either children or patients on immunosuppressant therapy.⁽⁶⁾ Although the first case of pneumaturia was reported a century before,⁽⁷⁾ the pathogenesis of renal tissue damage and gas production is still unknown. Glucose fermentation by the uropathogens and production of gases such as carbon dioxide and nitrogen has been implicated. High mortality rate of emphysematous pyelonephritis has been attributed to the septicemia and the hypothesis of the gas transport.

Management of patients with emphysematous pyelonephritis has been a subject of controversy. Huang and Tseng reviewed the management of 48 patients with emphysematous pyelonephritis. They concluded that for localized emphysematous pyelonephritis (class 1 and 2) according to CT scan, percutaneous drainage with antibiotic treatment

can provide a good outcome. For extensive emphysematous pyelonephritis (class 3 and 4) with more benign manifestations, when saving the kidney is possible, percutaneous drainage combined with antibiotic treatment may be attempted because of its high success rate. However, nephrectomy can provide the best management outcome and should promptly be attempted for extensive emphysematous pyelonephritis with a fulminant course.⁽⁸⁾ Wan and colleagues tried to define the reliable predictors of the outcome of patients with emphysematous pyelonephritis. They found that serum creatinine and platelet count were the most reliable predictors of outcome in patients with emphysematous pyelonephritis.⁽⁹⁾

In this case, the occurrence of the emphysematous pyelonephritis and the previous xanthogranulomatous pyelonephritis of the other kidney cannot be explained. The presence of urinary tract infection, however, can be implicated. The decision of prompt nephrectomy for this patient seemed to be justified, although the emphysematous pyelonephritis was localized on CT scan, since the patient was already a case of ESRD and was hemodynamically unstable. Therefore, attempting percutaneous drainage was not the choice.

In conclusion, emphysematous pyelonephritis is a severe life-threatening infection and should be suspected in a diabetic patient presenting with loin pain, fever, and septicemia not responding to antibiotic therapy. Immediate diagnosis and proper management can save the patient's life.

CONFLICT OF INTEREST

None declared.

ACKNOWLEDGEMENT

I would like to thank Dr Mohammad Y Khan for reviewing this manuscript. I also extend my thanks to Dr Mahoud R Hussein, consultant pathologist at Aseer Central Hospital, for slide preparations and Mr Jolly Mathews for secretarial assistance.

REFERENCES

1. Malek RS, Elder JS. Xanthogranulomatous pyelonephritis: a critical analysis of 26 cases and of the literature. *J Urol.* 1978;119:589-93.
2. Moriya A, Kubota K, Morita N. [A case of emphysematous pyelonephritis combined with xanthogranulomatous pyelonephritis]. *Hinyokika Kyo.* 1989;35:295-300. Japanese.
3. Puneekar SV, Kinne JS, Rao SR, Madiwale C, Karhadkar SS. Xanthogranulomatous pyelonephritis presenting as emphysematous pyelonephritis: a rare association. *J Postgrad Med.* 1999;45:125.
4. Ishigami K, Bolton-Smith JA, Deyoung BR, Barloon TJ. Necrotizing fasciitis caused by xanthogranulomatous and emphysematous pyelonephritis: importance of the inferior lumbar triangle pathway. *AJR Am J Roentgenol.* 2004;183:1708-10.
5. Langdale LA, Rice CL, Brown N. Emphysematous pyelonephritis in a xanthogranulomatous kidney. An unusual cause of pneumoperitoneum. *Arch Surg.* 1988;123:377-9.
6. Al-Makadma AS, Al-Akash SI. An unusual case of pyelonephritis in a pediatric renal transplant recipient. *Pediatr Transplant.* 2005;9:258-60.
7. Kelly HA, MacCallum WG. Pneumatouria. *J Am Med Assoc.* 1898;31:375.
8. Huang JJ, Tseng CC. Emphysematous pyelonephritis: clinicoradiological classification, management, prognosis, and pathogenesis. *Arch Intern Med.* 2000;160:797-805.
9. Wan YL, Lo SK, Bullard MJ, Chang PL, Lee TY. Predictors of outcome in emphysematous pyelonephritis. *J Urol.* 1998;159:369-73.