

BILATERAL EMPHYSEMATOUS PYELITIS AND OBSTRUCTION SUCCESSFULLY MANAGED WITH MEDICAL THERAPY AND PERCUTANEOUS DRAINAGE

Lutfi TUNÇ¹, Lokman İRKİLATA¹, Mustafa KIRAÇ¹, Suna Ozhan OKTAR¹, Figen Eksert İRKİLATA², Dr. İbrahim BOZKIRLI¹

ABSTRACT

Emphysematous pyelitis (EP) is a renal infection in which gas is encountered in the pelvicalyceal system. It is generally more benign than emphysematous pyelonephritis, in which the gas occurs in the renal parenchyma or perirenal tissues. However, if EP is accompanied by problems such as obstruction, it can require more than antibiotic therapy. Here we present a patient who had bilateral EP with bilateral obstruction, who was treated successfully with medical therapy and bilateral percutaneous drainage.

Key Words: Pyelitis, Treatment, Obstruction.

PERKÜTAN DİRENAJ VE MEDİKAL TEDAVİ İLE BAŞARILI BİR ŞEKİLDE TEDAVİ EDİLMİŞ BİLATERAL AMFİZEMATÖZ PYELİT VE ÜRİNER OBSTRUKSİYON

ÖZ

Amfizematöz pyelit (EP) pelvikalisyal sisteme havanın geçtiği renal enfeksiyondur. Genellikle havanın renal parankim veya perirenal alanda bulunduğu amfizematöz pyelonefritten daha benign bir tablodur. Ancak EP'ye obstrüksiyon gibi bir problem eşlik ettiğinde antibiyotik tedavisinden daha fazla tedavi gerektirebilir. Bu yazıda bilateral perkütan drenaj ve medikal tedavi ile başarılı bir şekilde tedavi edilen, bilateral obstrüksiyonun eşlik ettiği bilateral EP'li bir hasta sunulmaktadır.

Anahtar Kelimeler: Pyelit, Tedavi, Obstrüksiyon.

INTRODUCTION

Emphysematous pyelitis (EP) is a renal infection characterized by gas formation in the renal collecting system, and should be distinguished from the more severe emphysematous pyelonephritis (EPN), in which the gas occurs in the renal parenchyma or perirenal tissues (1). The most important risk factors for both diseases are diabetes mellitus (DM) and urinary obstruction. The pathogenic organisms are those that frequently form gas, such as *E. coli* and *Klebsiella* (2). The most frequent presenting symptoms are fever, nausea, vomiting, abdominal pain, shock, lethargy, and confusion. Emphysematous pyelitis has the better prognosis of the two (3). Differential diagnosis depends on identifying the location of the gas, and currently the best imaging method for this is computerized tomography (CT) (1). In the literature, EP has been reported less frequently than EPN. Here we present a patient in whom EP developed bilaterally in association with stones in both ureters.

CASE REPORT

A 49-year-old man with Type 2 DM presented with a 15-year history of urolithiasis. He had previously undergone shock-wave lithotripsy (SWL) several times, and 18 months before the present visit he had undergone left-sided pyelolithotomy. For the previous nine days, right-sided renal colic had been continuously present, and for the previous two days this had been accompanied by fever, nausea, vomiting, flank pain, and hematuria; with these complaints the patient was admitted to our emergency department. Upon physical examination he was alert, oriented, and cooperative. His temperature was 36.5 °C, pulse was 99 bpm, and blood pressure was 110/70 mmHg. In the kidney regions there was minimal tenderness to palpation bilaterally.

Laboratory values were as follows: blood glucose 718 mg/dl, blood urea nitrogen (BUN) 79 mg/dl, serum creatinine 6 mg/dl, leukocytes 12,100/mm³ (80% neutrophils, 18% lymphocytes, 2% eosinophils), serum sodium 112 mEq/L, and serum potassium 3.8 mEq/L. Urinalysis showed the following: density 1010, nitrate +, protein ++, glucose +++, and ketones ++. In every microscopic field, 40-50 erythrocytes and numerous leukocytes were visible. Urine and blood cultures were taken, and IV hydration and crystalized insulin infusion therapy were started.

Abdominal-pelvic plain radiographs showed gas in the pelvicalyceal system (Figure 1). On ultrasonography, marked dilatation was seen in the right kidney due to the ureteral stone. Air echogenicity was found in the pelvicalyceal system in both kidneys, and abdominal CT was performed, which revealed dilatation in the pelvicalyceal system of both kidneys, with air and fluid levels extending to the ureters, more markedly in the right kidney (Figure 2). In the renal parenchyma and perirenal areas, gas formation

¹Gazi Üniversitesi Tıp Fakültesi Üroloji Anabilim Dalı

²Gazi Üniversitesi Tıp Fakültesi Radyoloji Anabilim Dalı

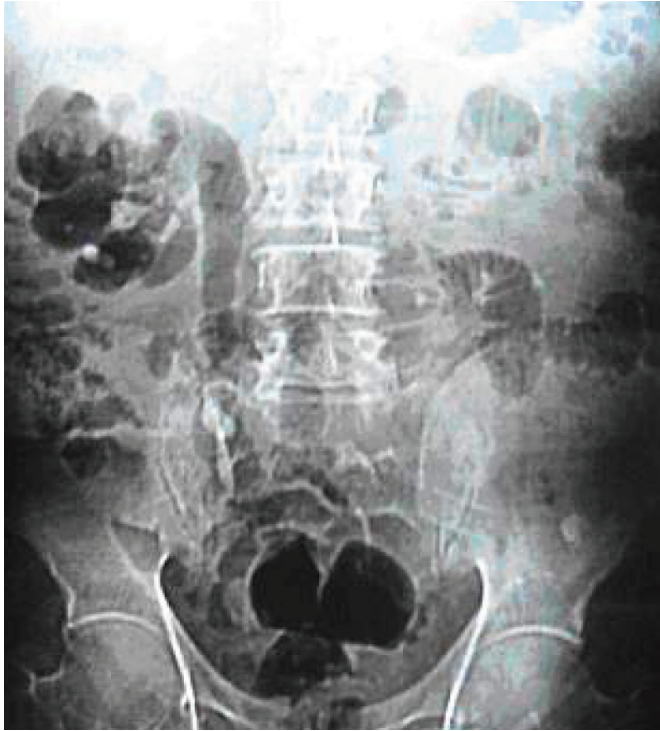


Figure 1: Dilatation was observed in the pelvicalyceal system of both kidneys, with air and fluid levels extending to the ureters, more markedly in the right kidney.

was not encountered. In the images showing the ureters, a 2×3 cm stone was visible in the middle portion of the right ureter, while a millimeter-size stone was visible in the proximal third of the left ureter.

As an emergency procedure, bilateral percutaneous nephrostomy catheters were placed and IV antibiotics were given as prophylaxis. From each nephrostomy, air and 200-250 ml of hemopurulent fluid were collected and were studied with cultures and with Gram and Wright stains. In the staining procedures, Gram-negative bacilli and abundant polymorphonuclear leukocytes (PMNLs) were detected. Cultures produced 100,000 colonies of *E. coli*, and antibiotics were administered in accordance with sensitivity tests. Within 10 days of the nephrostomy placement, serum creatinine levels had decreased to 1.3 mg/dl and BUN had fallen to 30 mg/dl. After 15 days of drainage and medical therapy, with the patient's DM regulated and the urinary infection under control, ureteroscopy, pneumatic lithotripsy, stone extraction, and D-J stent insertion were performed on the right side. On ureteroscopy of the left kidney, the previously diagnosed small stone was not encountered, and a D-J stent was inserted. After the procedure the nephrostomies were clamped and removed from the patient. The patient was discharged with a prescription for a three-week course of antibiotic therapy. On follow-up two months later, he had no complaints.

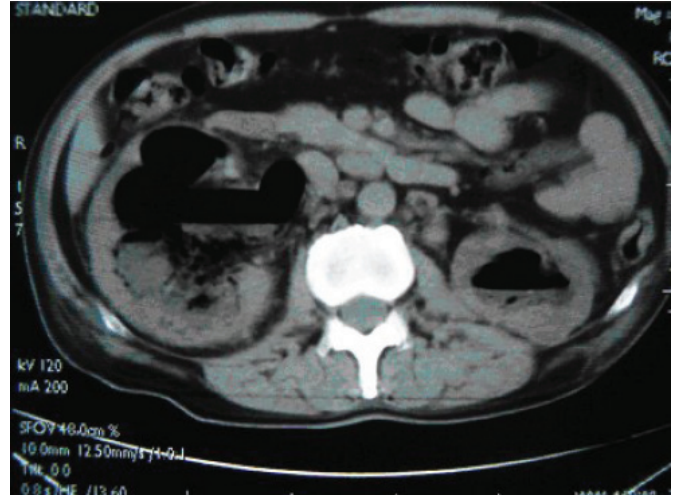


Figure 2: The image showing the renal parenchyma and perirenal areas; gas formation was not encountered.

DISCUSSION

EP and EPN should be distinguished from each other because they can differ markedly in terms of management and prognosis (3,4). EP is generally considered the more benign of the two, being more easily treated and having a better prognosis (3) and a lower mortality rate (1). EP and EPN can be differentiated radiologically, and the standard method for this is CT.

EP has been reported much less frequently than EPN in the literature, and therefore appears to be the rarer of the two diseases (1). In terms of epidemiology, EP and EPN are both associated with diabetes mellitus and obstruction (5). Pathogenic organisms reported in EP and EPN include *E. coli*, *Klebsiella pneumoniae*, *Enterobacter aerogenes*, *Proteus mirabilis*, *Citrobacter*, and *Candida* (6-8). Radiologically, EP is defined as the presence of gas limited to the collecting system of the kidney, whereas in EPN the gas also extends into the parenchyma or perirenal tissues. A classification system for EPN has been proposed by Wan et al. (5), based on the radiological appearance. In this system, Type I EPN is defined as the presence of diffuse gas throughout the parenchyma in a streaked or mottled pattern, with renal parenchymal destruction and little or no fluid. Type II EPN is defined as a bubbly or localized gas pattern accompanied by renal or perirenal fluid, or as gas in the collecting system with acute bacterial nephritis or renal or perirenal fluid containing abscesses. Type II EPN has a better prognosis than Type I EPN.

Treatment of EP and EPN varies according to the severity and presence of additional problems such as obstruction. For EP, medical therapy may be sufficient if there is no obstruction (1). For EPN, the recommended treatment is to begin with medical therapy, followed by nephrectomy if necessary (9). Treatment in our patient required more than simple antibiotic therapy because the bilateral EP was accompanied by bilateral obstruction, as shown by hydronephrosis on CT. We therefore

chose percutaneous nephrostomy as an additional procedure to provide immediate drainage. After 15 days of drainage and medical therapy, the patient's treatment was completed with ureteroscopy and pneumatic lithotripsy.

In conclusion, although EP is considered more benign than EPN, medical therapy may not be sufficient for treating EP that is accompanied by obstruction, particularly when the obstruction is bilateral, as in the patient presented here. In this situation, we found that antibiotic therapy augmented by percutaneous drainage provided successful treatment.

Correspondence Address

Lütfi Tunç

Çukurambar mah. 38. cad. 3 / 21

Balgat ANKARA

Tel: 05325460994

E mail: lutfitunc@gmail.com

REFERENCES

1. Roy C, Pflieger DD, Tuchmann CM, Lang HH, Saussine CC, Jacquemin D. Emphysematous Pyelitis: Findings in five patients. *Radiology* 2001; 218: 647-650.
2. Schultz EH, Klorfein EH. Emphysematous pyelonephritis. *J Urol*, 1962; 87: 762.
3. Baumgarten DA, Baumgartner BR: Imaging and radiologic management of upper urinary tract infections. *Urol Clin North Am* 1997; 24: 545-569.
4. Rodriguez-de-Velasquez A, Yoder IC, Velasquez PA, et al: Imaging the effect of diabetes on the genitourinary system. *RadioGraphics*, 1995; 15: 1051-68.
5. Wan YL, Lee TY, Bullard MJ, Tsai CC. Acute gas producing bacterial renal infection: correlation between imaging findings and clinical outcome. *Radiology* 1996; 198:433-438.
6. Evanoff GV, Thompson CS, Foley R, Weinman EJ. Spectrum of gas within the kidney: emphysematous pyelonephritis and emphysematous pyelitis. *Am J Med* 1987; 83: 149.
7. Michaeli J, Mogle P, Perlberg S, Heiman S, Caine M. Emphysematous pyelonephritis. *J Urol* 1984; 131: 203.
8. Zabbo A, Montic JE, Popowniak KL, Weinstein AJ. Bilateral emphysematous pyelonephritis. *Urology* 1985; 25: 293.
9. Muttarak M, Na Chiang Mai W. Clinics in diagnostic imaging (99). *Singapore Med J* 2004; 45: 340-342.