



A Rare Intraabdominal Infection; Renal Abscess

Nadir Bir Intraabdominal Enfeksiyon: Renal Apse

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ABSTRACT

Introduction: Renal abscess is an uncommon intraabdominal infection. It can cause significant morbidity and mortality. Diabetes mellitus (DM), urinary tract abnormalities, chronic debilitating disease, and intravenous drug abuse are the predisposing factors.

Case Report: In this case report, we present a 30-year-old immunocompetent woman who presented with fever, dysuria, pollakiuria, right flank pain, nausea, and vomiting. She was first diagnosed as pyelonephritis. But, further investigations were made, and a renal abscess was found.

Conclusion: Special attention should be given to patients with urinary tract infections having fever and ongoing symptoms despite antimicrobial treatment.

Keywords: Renal abscess, thrombocytopenia, leukopenia, computerized tomography

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ÖZET

Giriş: Renal apse nadir görülen bir intraabdominal enfeksiyondür. Belirgin morbidite ve mortaliteye neden olabilir. Diabetes Mellitus, üriner sisteme ait anormallikler, kronik hastalıklar ve intravenöz ilaç kullanımı predispozan faktörlerdir.

Olgu Sunumu: Biz bu vakada 30 yaşında yüksek ateş, dizüri, pollakiüri, sağ yan ağrısı, bulantı ve kusma ile başvuran bir hastayı sunmaktayız. Hastada ilk önce pyeleonefrit teşhisi konulmuş ancak ileri tetkikler sonucunda renal apse tespit edilmiştir

Sonuç: Antimikrobiyal tedaviye rağmen semptomları devam eden ve ateşi olan üriner sistem enfeksiyonlu hastalara daha fazla dikkat edilmelidir.

Anahtar Kelimeler: Renal apse, trombositopeni, lökopeni, bilgisayarlı tomografi

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Introduction

Suppurative infections of the kidney and the perinephric space are uncommon. They can cause significant morbidity and mortality (1). Diabetes mellitus (DM) and urinary tract abnormalities, such as nephrolithiasis, vesicoureteral reflux (VUR), and anatomic abnormalities in the urinary tract are the predisposing factors. Some other less common causes are immunosuppression, chronic debilitating disease, and intravenous drug abuse. Renal abscess usually occurs in the setting of ascending infections with obstructed pyelonephritis (commonly due to gram-negative enteric bacilli) (2).

We report the management of an immunocompetent young patient with a renal abscess who had no renal disease, nephrolithiasis, or anatomic abnormality in the kidneys.

Case Report

A 30-year-old immunocompetent woman who came to the emergency department (ED) with chills and 39°C fever had normal C-reactive protein (CRP), white blood cell (WBC), and urinalysis. The patient's fever was reduced with intravenous paracetamol. Her urine culture was taken and sent home with prescribed paracetamol. In her medical history she gave birth via *cesarean* section and was breastfeeding her 6-month-old baby.

The next day, she came again to the ED with 38.2°C fever, dysuria, pollakiuria, right flank pain, nausea, and vomiting added to her complaints. Right costovertebral angle tenderness and tenderness with deep palpation at the paraumbilical area were de-

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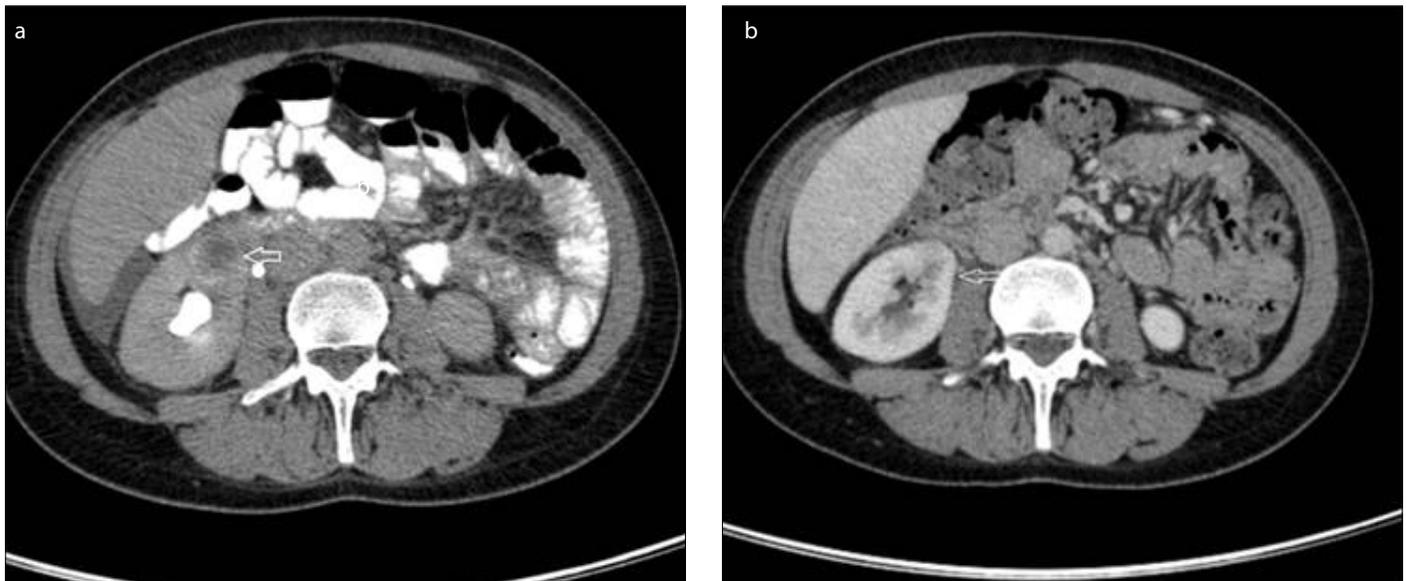


Figure 1. a) On the right kidney 2-cm and 1-cm postcontrast hypodense areas. b) Free fluid around the kidneys

terminated in the physical examination. The laboratory examinations were repeated, and her results were: CRP: 103 mg/L; WBC: 11,400 μ L; platelets (PLT): 78,000 μ L; and urinalysis: WBC (+), nitrite (+), and bacteria (+). She was diagnosed with pyelonephritis and hospitalized to our hospital. Intravenous (IV) hydration and 2 gr ceftriaxone (Isef 1gr, I.E.Ulagay, Istanbul, Turkey) were administered.

On the second day of usage of IV ceftriaxone, *E. coli* was grown in the culture, which was susceptible to most of the antibiotics (including Ciprofloxacin and Ceftriaxone). Ciprofloxacin 2x200 mg IV (Ciflosin-200mg, Deva İlaç, Kocaeli, Turkey) was added to her treatment due to continuation of fever. CRP increased to 214 mg/L, WBC decreased to 7700 μ L, PLT decreased to 57,000 μ L, and Hb (hemoglobin) was 10.2 g/dL. USG (LOGIQ E9, GE Healthcare, Milwaukee, WI, USA) evaluation was performed. The patient's kidneys were normal, and splenomegaly and free fluid in the peritoneal cavity were determined in the USG.

On the following day, CRP decreased to 145 mg/L, PLT increased to 67,000 μ L, WBC decreased to 4850 μ L, and Hb decreased to 9.8 g/dL. Due to continuation of fever, contrast-enhanced CT (Philips, Brilliance 64-channel, Amsterdam, NL) was performed. Splenomegaly (120x61 mm), slightly dilated right ureter and calyx, and 2-cm and 1-cm postcontrast hypodense areas were found on the right kidney that were compatible with abscess; free fluid in the peritoneal cavity and around the kidneys was found in the CT (Fig. 1). Because the abscess was smaller than 5 cm and had no clinical symptoms of obstruction, abscess drainage was not applied. The patient's treatment was changed to IV meropenem 3x1 gr (Mopem 1gr, Tüm Ekip İlaç AŞ, İstanbul, Turkey).

On the second day of the usage of meropenem, CRP decreased to 97.8 mg/L, PLT decreased to 98,000 μ L, and Hb was 9.0 gr/dl. Right costovertebral angle tenderness and fever decreased.

On the third day of usage of meropenem, CRP was 58.9 mg/L, PLT was 180,000 μ L, and Hb was 10.6 gr/dl. Right costovertebral angle tenderness and fever decreased. Meropenem was discontinued, and IV ertapenem 1x1 gr was started, and the patient was discharged from the hospital. This treatment was continued for 3 weeks. After this treatment, the patient's symptoms, laboratory, and radiological findings were improved.

Discussion

Renal abscess can arise from both an initial urinary tract infection (UTI) (usually due to gram-negative enteric bacilli) and hematogenous spreading (due to *Staphylococcus aureus*) of bacteria from a primary focus of infection outside the kidney (3). Diabetes mellitus and urinary tract abnormalities are usually predisposing factors. In our case, the patient had no predisposing factors, and the infection was probably from an ascending infection with *E. coli*.

Escherichia coli is a gram-negative, rod-shaped bacterium that is commonly found in the intestine of humans (4). The urinary tract can be infected with an ascending infection with *E. coli* and may cause complications. The *E. coli* that grew in our culture was susceptible to most antibiotics, including ceftriaxone and ciprofloxacin. Although we gave those antibiotics, the clinical and laboratory findings did not improve.

The symptoms of renal abscess, which are fever, flank pain, dysuria, frequency, and pollakiuria, are similar to the symptoms of acute pyelonephritis (5). The diagnosis should be considered in patients with signs and symptoms of acute renal infection that fail to improve after 5 days of appropriate antimicrobial therapy (6, 7). Our patient had such symptoms, and our initial diagnosis was pyelonephritis. But, because of the continuation of fever and high laboratory results, we changed our diagnosis to renal abscess.

Blood and urine cultures should be collected before antimicrobial therapy. Pyuria, moderate proteinuria, and hematuria can be found in the urinalysis. However, the urinalysis may be normal if the source of infection is hematogenous (8). In the complete blood count, leukocytosis is frequently observed. ESR and CRP are also high in deep-seated infections. In our case, the patient also had high CRP values, which indicated infection. However, our patient had thrombocytopenia and leukopenia. Therefore, we further investigated if our patient had hemolytic-uremic syndrome or not.

Hemolytic-uremic syndrome is a disease characterized by hemolytic anemia (caused by destruction of red blood cells), acute kidney failure (uremia), and a low platelet count (thrombocytopenia). It predominantly, but not exclusively, affects children. Most cases are preceded by an episode of infectious, sometimes bloody, diarrhea caused by *E. coli*, which is acquired as a foodborne illness or from a contaminated water supply. It is a medical emergency and carries a 5%-10% mortality rate; of the remainder, the majority recovers without major consequences (9). In our case, petechiae, ecchymosis, and fragmented red blood cells were not found in her physical examination, and the laboratory results, LDH (lactate dehydrogenase), and bilirubin were in normal intervals. HUS was excluded.

We should use radiology for a definite diagnosis. Renal abscess can be reliably diagnosed by USG and a CT scan with dimensions varying from 2 cm to 1.5 cm. CT is the most specific imaging method, as there is better contrast comparison (10). Contrast-enhanced CT showed 2 renal abscesses in our case. However, the USG was normal. This means that contrast-enhanced CT is better than USG in showing renal abscess.

After taking blood and urine cultures, broad-spectrum (empiric therapy) antibiotics should be started at the time of presentation. Abscesses smaller than 5 cm are usually treated with antibiotics. Antibiotics should be chosen according to the antibiogram result. However, abscesses larger than 5 cm involve percutaneous drainage plus parenteral antibiotics. CT and USG should be used during percutaneous drainage of abscesses. We used only meropenem 3x1 gr, because our patient's renal abscess was smaller than 5 cm.

CRP, WBC, ESR, flank pain, costovertebral angle tenderness, and temperature are important parameters during the follow-up. Antibiotic treatment should be continued at least 2 to 3 weeks. The duration of antibiotic use is determined by complete clinical, laboratory (ESR, CRP), and radiographic resolution of the renal abscess. Twenty-four hours after taking meropenem, our patient's symptoms regressed dramatically. On the third day of meropenem usage, most of the laboratory findings approached normal.

Renal abscesses are uncommon clinical situations. Special attention should be given to patients with urinary tract infections having fever and ongoing symptoms despite antimicrobial treatment.

In conclusion, renal abscess are uncommon clinical situation. Special attention should be given to patients with urinary tract infec-

tions having fever and ongoing symptoms despite antimicrobial treatment. In this situation, we should further investigate our case with contrast-enhanced CT in order to exclude or make a diagnosis of renal abscess.

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References

- Meng MV, Mario LA, McAinch JW. Current treatment and outcomes of perinephric abscesses. *J Urol* 2002; 168: 1337-40. [\[CrossRef\]](#)
- Coelho RF, Schneider-Monteiro ED, Mesquita JL. Renal and perinephric abscesses: analysis of 65 consecutive cases. *World J Surg* 2007; 31:431-6. [\[CrossRef\]](#)
- Hoverman IV, Gentry LO, Jones DW, Guerriero WG. Intrarenal abscess. Report of 14 cases. *Arch Intern Med*; 1980; 140: 914 [\[CrossRef\]](#)
- Schaechter M. *Escherichia Coli*. *Encyclopedia of Microbiology* (Third Edition); 2009; 125-32
- Yen DH, Hu SC, Tsai J. Renal abscess: early diagnosis and treatment. *Am J Emerg Med* 1999; 17: 192-7. [\[CrossRef\]](#)
- Meyrier A, Guibert J. Diagnosis and drug treatment of acute pyelonephritis. *Drugs* 1992; 44: 356-67. [\[CrossRef\]](#)
- Ramakrishnan K, Scheid DC. Diagnosis and management of acute pyelonephritis in adults. *Am Fam Physician* 2005; 71: 933-42.
- Sheinfeld J, Erturk E, Spataro RF, Cockett AT. Perinephric abscess: current concepts. *J Urol* 1987; 137:191-4.
- Corrigan JJ, Boineau FG. Hemolytic-uremic syndrome. *Pediatr Rev.*2001; 22: 365-369.
- López Alcina E, Arlandis Guzmán S, Monserrat Monfort JJ. Renal and perirenal abscess. *Actas Urol Esp* 1999; 23:135-9.