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A Renal Abscess in the Isthmus of a Horseshoe Kidney

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ABSTRACT

Horseshoe kidney is a rare congenital malformation predisposing the patient to urinary tract infections. We present a case of a renal abscess occurring in an adult patient with a horseshoe kidney. A computed tomography scan confirmed the diagnosis of an abscess in the isthmus of the horseshoe kidney. A compete regression of the abscess was achieved by a prolonged course of antibiotics.

INTRODUCTION

A renal abscess is a rare complication of kidney bacterial infections [1]. A literature review revealed only rare cases of severe renal infection in a horseshoe kidney [2,3]. Herein, we present a case of renal abscess in a horseshoe kidney, in an adult, that was managed successfully with antibiotics as the sole treatment. To the best of our knowledge, this is the first observation of an abscess associated with a horseshoe kidney.

CASE REPORT

A 46-year-old man with no known prior medical history presented with hyperthermia and abdominal pain. The physical examination showed mild pallor, tachycardia, and a temperature of 102.74° F. An abdominal examination revealed pain in the right lumbar region and lower abdomen. Laboratory tests revealed hemoglobin of 6.9 gm/dL, a leukocyte count of 17 900/mm3 with polymorphs of 72%, a platelet count of 259 000/mL, blood glucose levels of 1.02 g/L, serum creatinine of 14 mg/l, and a C-reactive protein level of 332 mg/l.

The patient's abdominal ultrasound showed a horseshoe kidney with bilateral, middle hydronephrosis. The abdominal computed tomography (CT) scan (Figure 1) showed a rounded, low-density, and nonenhancing lesion 2 cm in size in the isthmus of a horseshoe kidney, suggestive of a renal abscess. *Escherichia coli* sensitive to ceftriaxone and ofloxacin grew in the patient's urine culture. Three blood cell cultures were negative. Intravenous antibiotics were started (gentamicin: 160 mg/day and ofloxacin: 2 g/day). After 48 hours of treatment, the patient became afebrile. He was discharged, and he was given a 2-week treatment of oral antibiotics (ofloxacin: 400 mg/day). A CT scan after 1 month was unremarkable (Figure 2) (new CT section at the same level as Figure 1). The patient remained afebrile and asymptomatic. His urine culture was negative.

COMMENTARY

A renal abscess is a rare entity resulting from an infection of the kidney. In the past, they were associated with high morbidity and mortality rates due, in part, to a late diagnosis [4,5]. A renal abscess develops from ascending infections of the lower urinary tract or by hematogenous seeding from primary sites of infection. Ascending infections account for more than 75% of all renal abscesses. *Escherichia coli*, pseudomonas, proteus, and *Klebsiella pneumoniae* are the most frequently isolated germs [6]. In contrast, renal abscesses that develop by hematogenous bacterial seeding are usually associated with *Staphylococcus aureus* [1,7]. The mean age of patients with renal abscesses ranged from 41 to 53 years [8,9] with a slight female predominance (sex ratio of about 1:3) [5].

Clinical symptoms are vague and nonspecific, making the diagnosis late and difficult [4,5]. Fever, back pain and/or abdominal pain, chills, and vomiting are the most common clinical manifestations [3]. Urinary symptoms may be absent [3]. There are no symptoms or specific signs that allow us to differentiate this process from simple acute pyelonephritis. However, the persistence of fever and symptoms for more than

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48 hours, despite an efficient antibiotherapy, should suspect the existence of a renal abscess [6]. The diagnosis is confirmed on the radiological findings [10].

In several studies, urinary obstruction and renal stones have been reported as common predisposing conditions, with an incidence of 21 to 50% and 24 to 54%, respectively [11]. Horseshoe kidney is a congenital malformation that may predispose the patient to severe urinary tract infections due to pelvic ectasia, which is inherent in the malrotation of the 2 renal units [3]. To the best of our knowledge, it has not been previously reported in association with renal abscess, but it could be considered a predisposing factor.

For some authors, ultrasonography (US) is the technique of choice for an initial assessment of patients with suggestive signs of severe kidney infection. It's safe, easy to handle, and offers a low cost [6]. The renal abscess appears as a uni- or multifocal hypoechoic lesion, but may be iso- or hyperechoic, interrupting the corticomedullary differentiation [3].

Documentation has considered CT scans superior to US for diagnosing renal abscesses, with an accuracy rate of 90 to 100%. CT scans detect small-sized abscesses and help differentiate abscesses from other mass-like lesions. A nonlobar, homogeneous, low-density intrarenal lesion strongly suggests necrosis and abscess formation [4,5,12]. The role of magnetic resonance imaging (MRI) is not well defined. This technique, considered superior to a CT scan in differentiating between benign and malignant renal masses, provides no more information on renal infections [6,8].

A renal abscess requires prolonged treatment with broad-spectrum antibiotics, which must initially be administered intravenously. Treatment must continue for a period of 3 to 6 weeks [3]. If antibiotic treatment was not enough to achieve clinical remission, percutaneous or open surgery drainage is required. Open surgical drainage is costly and exposes the patient to the risks and morbidity of surgery, including possible nephrectomy. However, percutaneous abscess drainage provides a nonoperative alternative [10]. Siegel et al. [13] suggested an algorithmic approach to the management of renal abscesses. They recommend primary conservative management using antibiotics in small abscesses (< 3 cm) and drainage (percutaneous or surgical) in large abscesses (> 5 cm). In the present case, the abscess was small so medical treatment was indicated.

We emphasize close follow-up in patients with diabetes mellitus or urinary obstructions and the management of possible risk factors of this serious infection.

CONCLUSION

Figure 1. The abdominal CT scan shows an abscess in the isthmus of a horseshoe kidney (arrow).

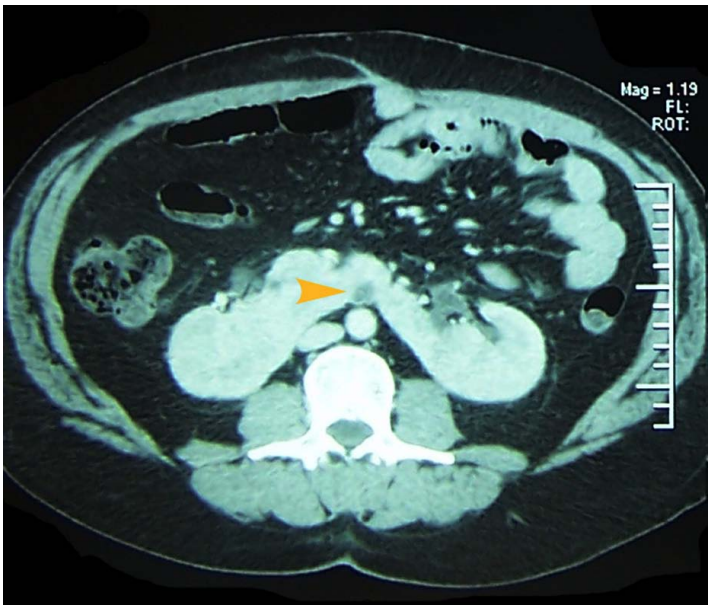
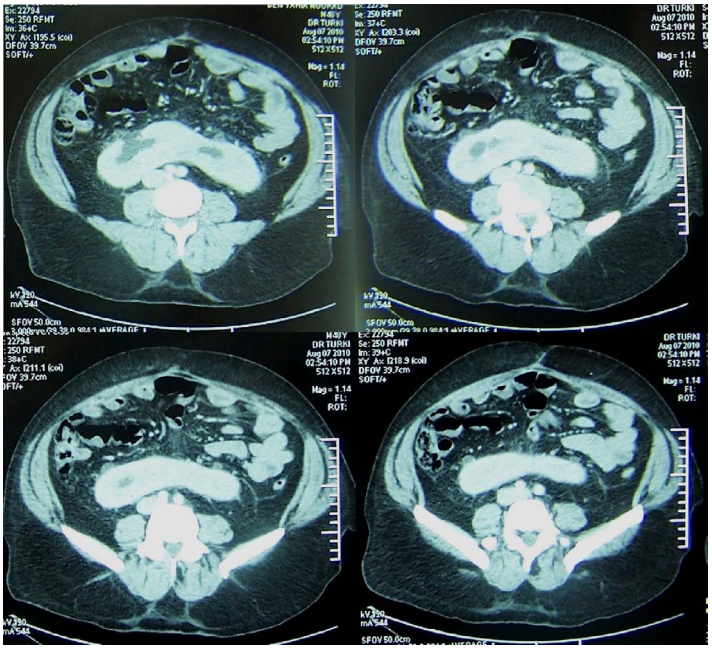


Figure 2. An abdominal CT scan of a horseshoe kidney with normal aspect parenchyma.



Medical therapy, without surgery, should be considered a valuable option for the treatment of a renal abscess with an early diagnosis, even with renal abnormality.

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