Bilateral Renal Abscesses in a Healthy Child

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Renal cortical abscess (carbuncle) in pediatric patients is rare due to the widespread use of antibiotics for skin infection or trauma. *Staphylococcus aureus* remains the predominant causative agent of renal abscess, especially in otherwise healthy children. Sterile urine cultures suggest hematogenous seeding of the kidney from a remote site of infection. Here we report on bilateral renal abscesses in a boy with a history of antecendent skin infection and trauma.

Patient Description

An 11 year old boy was referred to our hospital with a high fever and severe abdominal pain of 4 days duration. He had fallen off a waterslide more than a month previously and since then, even though he maintained his daily routine, suffered nausea and malaise and had lost 7 kg in weight.

On admission he had a fever of 40°C and marked diffuse tenderness over the abdomen. He also had leukocytosis (16.3 x 10^9/L, 70% neutrophils) and an erythrocyte sedimentation rate of 98 mm/hour. Urinalysis, blood urea nitrogen (4.3 mmol urea/L) and serum creatinine (62 µmol/L) were normal. Ultrasound examination of the

Ultrasound image of the left kidney, showing an abscess within the renal cortex, 3.6 x 3.2 cm in diameter.

abdomen showed two heterogeneous mass-like areas measuring 5.8 x 3.6 and 2.8 x 2.4 cm in the upper pole of the right kidney and a similar single central lesion (3.4 x 3.2 cm) in the left kidney [Figure]. Computerized axial tomography of the abdomen exhibited similar findings with enlargement of both kidneys.

Based on the presumptive diagnosis of a B or T cell lymphoma we performed a bone marrow biopsy examination that was found to be normal. Thereafter, an open right kidney biopsy was done and on puncturing one of the masses yellow pus was obtained; culture grew *Staphylococcus aureus* susceptible to cloxacillin, erythromycin and cefazolin. Pathologic examination of adjacent renal tissue showed acute inflammatory changes. Several blood and urine cultures were sterile. Tuberculin skin test was found to be negative. Immunologic evaluation, including serum immunoglobulins, complement levels and functional leukocyte tests (chemotaxis and oxidative burst), was within normal range.

Intravenous cloxacillin was initiated and within 3 days the child became afebrile with no abdominal pain. At that time the family members recalled that while toppling over the waterslide, a subcutaneous abscess on the boy's left buttock had ruptured and then healed spontaneously. There was no history of any urinary tract infection in the past. Cloxacillin was given parenterally for 5 weeks and then enterally for 8 weeks. Two months later a repeat ultrasound showed complete resolution of the renal masses.

Comment

This child most probably had hematogenous bilateral staphylococcal renal abscesses. Staphylococcal spread to the renal cortex from a cutaneous site via the bloodstream is still the predominant cause of renal carbuncles in otherwise healthy children [1] and is three times more common in males than in females [2]. Most abscesses are unilateral (97%), single lesions (77%) occurring in the right kidney (63%) [2]. Abscess formation is more enhanced in the renal cortex than in the medulla because of the richer blood supply and lymphatics and lower interstitial pressure [3].

It may be difficult to distinguish other intrarenal infections, such as acute lobar nephronia caused by aerobic gram-negative bacteria and perinephric abscesses, from renal cortical abscesses. Acute lobar nephronia (acute focal bacterial nephritis) is a severe form of infection affecting a single renal lobe [2]. The affected tissue shows interstitial inflammation and a marked infiltrate of polymorphonuclear leukocytes. Acute focal bacterial nephritis occurs most commonly as a complication of ascending urinary tract infection associated with an underlying urinary tract abnormality. The most common abnormalities include obstructive problems or vesico-ureteral reflux, particularly in children. Enteric aerobic gram-negative bacilli, including *Escherichia coli*, *Klabsiella* and *Proteus*, gain access to renal parenchyma by reflux and inoculate the renal medulla [3]. In contrast, the development of *S. aureus* renal cortical abscess is thought to be hematogenous, and the presence of sterile urine cultures suggest an extrarenal source of infection.

In series of children with renal abscess, more than 75% of the patients presented with febrile episodes with temperatures above 39.5°C and flank tenderness or pain, associated with leukocytosis and elevated erythrocyte sedimentation rate [4]. Since the causative pathogen is most likely *Staphylococcus aureus* it is recommended that patients be treated by intravenous administration of a β-lactamase-resistant penicillin for at least 3–4 weeks pending abscess resolution by radiologic evaluation [5].

Many patients are not diagnosed prior to surgery. Delayed diagnosis is due to the vagueness of symptoms, such as nausea, malaise, weight loss and low grade fever. Additionally, the primary infected site, usually cutaneous, is frequently not revealed when taking the medical history, and the appearance of the renal abscess by ultrasound or CT may not differ from that of a primary tumor or a lymphoma. Knowledge of the clinical pattern of renal abscess may promote early diagnosis and allow for antibiotic treatment alone.

References

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The comforter's head never aches

Italian proverb