



Imaging-guided drainage of renal abscess: A case report and literature review

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ABSTRACT

Renal and perinephric abscesses are rare but severe infections of urinary tract. It may have atypical causes and requires usually an emergency management. A young patient presented with right flank pain, fever and chills was diagnosed with a large renal abscess ruptured in perinephric space. He underwent successful percutaneous drainage guided by both ultrasound and computed tomography of the abdomen. The concept of percutaneous route and the role of imaging, particularly ultrasound, in managing such emergencies are discussed alongside with a review of current literature.

Section headings: Inflammation and Infection.

1. Introduction

Renal abscess is a collection of purulent material confined to the renal parenchyma, it may follow insufficient treatment of focal bacterial nephritis (lobar nephronia).¹ More rarely, it is due to haematogenous spread of infection from distant site. The extension of infection outside the kidney may form perinephric abscess which develops within Gerota's fascia.

Ultrasound (US) is a simple and widely available tool to use for early diagnosis, but also for drainage of renal abscess. However some locations may seem challenging. We describe an uncommon case highlighting the successful US-guided drainage of a right kidney carbuncle ruptured into hepato-phrenic space in a young patient with history of recurrent skin infections and otherwise normal urinary tract.

2. Case presentation

A 34-year-old man presented to our department with right flank pain, fever and chills since five days ago, without lower urinary tract symptoms. His medical history was insignificant apart from recurrent furuncles occurring during the last 6 months and treated with Amoxicillin + Clavulanic acid along with local antiseptic. Physical examination revealed a 39.5°C febrile patient, hemodynamically stable and without palpable flank or abdominal mass, but noted scars of past skin abscesses located at the left arm, thoracic and cervical regions.

Admission laboratory data found white blood cells WBC 15 000/ μ l, Proteine C-Reactive 200 mg/l, normal creatinine serum and normal hemoglobin. Urinalysis showed no sign of infection and urine culture was conducted which lately revealed no pathogen growth. Also testing for HIV status, after patient consent, was done and revealed negative result. Ultrasonography showed non specific right kidney mass measuring approximately 5,4cm/4,8cm (Fig. 1). Abdominal computed tomography (CT) scan with contrast agent was then performed and confirmed the diagnosis of right renal abscess with typical peripheral contrast enhancement and low density non-enhanced center containing fluid collection that extended from the mid and lower pole of the kidney into perirenal space (Fig. 2). Otherwise, the urinary tract was without abnormality.

Firstly, empiric antibiotics and hydration were given intravenously. 48 hours after, percutaneous drainage was performed. Under ultrasound guidance and local anesthesia with Lidocaine, a puncture of the abscess was performed through the right flank using 8 Hz US probe, viseur and 18 Gauge Chiba needle. Aspiration of purulent material was done, and a 12 Fr nephrostomy tube was left in place for 2 weeks after precise placement was confirmed by CT (Fig. 3) on day 4. Surprisingly, Culture of pus yielded coagulase-negative Staphylococcus as sole germ. Antibiotic therapy was adjusted to sensitivity profile and, after defervescence has occurred, was switched to oral route for 6 weeks.

During follow-up visits at day 15, 1 month and 6 months, the patient has made a full recovery with complete improvement of clinical,

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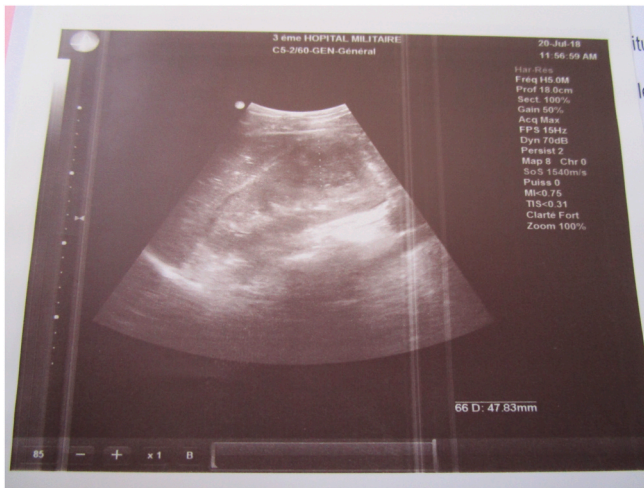


Fig. 1. Abdominal Ultrasonography showed non specific right kidney mass located in the mid and lower pole measuring approximately 5,4cm/4,8cm.

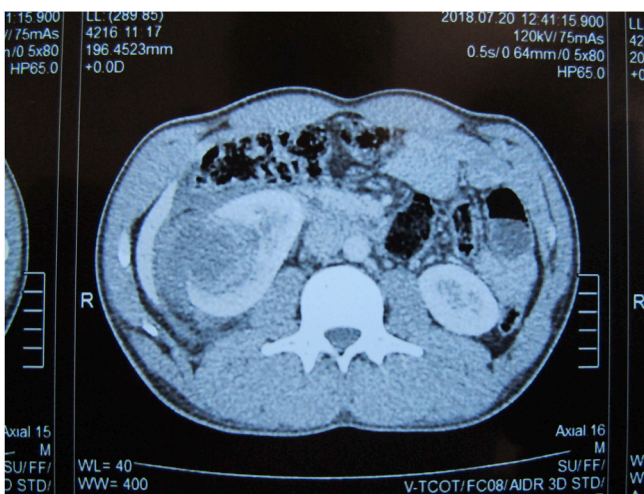


Fig. 2. Contrast-enhanced abdominal CT at admission showed typical right kidney abscess measuring > 5cm in the middle-lower pole and ruptured in the perinephric space.

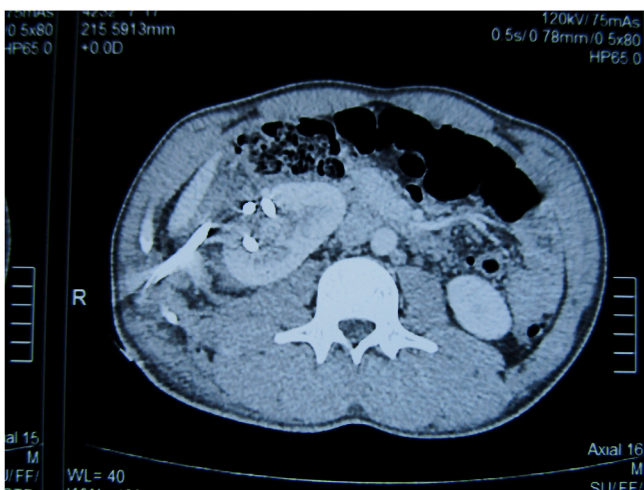


Fig. 3. Precise placement of a 12 Fr nephrostomy tube within the collection was confirmed 4 days later by CT.

biological and radiological parameters. The whole treatment course was without adverse events and the patient was very satisfied with such a minimally invasive management.

3. Discussion

Intrarenal and perinephric abscesses are uncommon but potentially lethal complications of urinary tract infection and bacteremia. The incidence ranges from 1 to 10 cases per 10 000 hospital admissions and it affects men and women equally.² Most renal abscesses are caused by gram-negative bacilli, and the most common etiology is ascending infection associated with urologic abnormality, obstruction or calculi. In such cases, the patient may have experienced previous episodes of kidney infection and be chronically pyelonephritic and scarred. Also, diabetes mellitus, immunodepression and previous urologic surgery have been shown to be predisposing factors.² A second and rarer pathophysiologic mechanism is haematogenous seeding of infection from distant site or infection from adjacent organs (i.e. bowel).¹ Our patient, which had no comorbidities, a normal urinary tract, and a history of recurrent skin furuncles, is an illustrative example of that later mechanism.

Many contemporary series have emphasized the role of percutaneous drainage including US-guided in the management of abdominal and retroperitoneal collections. In a series of 52 patients with renal abscesses with a follow-up rate of 98% percutaneous drainage was as effective as open surgery in large (greater than 5cm.) and medium (3–5cm.) abscesses, whereas small ones (less than 3cm.) were effectively treated with a course of intravenous antibiotic therapy.³ Hung et coll. Also reported similar outcomes with open surgery in a comparative study.⁴ More interestingly, a nationwide comparative study of the American college of radiology reported in 2015 that there are increased trends in the use of percutaneous drainage of abdominal abscesses, whereas use of open surgical drainage has declined since 2001, giving an another good example of radiology-related value.⁵

Although CT scan appears to be the most efficient method for accurate diagnosis and follow-up, ultrasound has been increasingly used for diagnosis and drainage of renal abscess and perinephric collections. The main reason behind the fact is that US is easy to perform and more widely available than CT, especially in countries with limited resources and also in emergency circumstances. In our case, ultrasound has played a major role in getting an early diagnosis, and more interestingly, in performing, without delay, a precise and efficient drainage of the purulent collection. Consequently, our patient has had a quick recovery without major functional or anatomical damage.

4. Conclusion

Renal and perinephric abscesses are rare but severe suppurations of the abdomen which can occur in an otherwise normal urinary tract. Ultrasound is very useful for early diagnosis, but also for guiding, alongside CT, precise and efficient drainage of large collections in order to achieve a quick and complete recovery.

Consent

Consent from the patient was obtained.

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Declaration of competing interest

None.

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