Infected Renal Cyst: Report of a Case

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Infection of solitary renal cysts usually occurs as a complication of either bacteriuria with ascending infection or hematogenous spread. However, it can also occur as a result of iatrogenic cyst instrumentation. It is difficult to differentiate between an infected solitary cyst and a cortical renal abscess on the basis of symptoms, signs and even renal imaging. Infected renal cysts may initially present as an abdominal mass, so malignancy should be ruled out. We report here of a 65-year-old woman with diabetes mellitus who previously suffered from a single large renal cyst. She received percutaneous drainage at another hospital, but the procedure was complicated by a catheter infection that resulted in an infected renal cyst. Percutaneous drainage was performed again and antibiotics were prescribed. Malignancy was ruled out and no fistula formation was noted. The patient recovered one month later and was discharged. Solitary renal cysts are common in nephrological practice. Cyst infection can be avoided with careful needle aspiration. **(Mid Taiwan J Med 2001;6:185-90)**

Key words

infected renal cyst, percutaneous drainage, renal abscess

INTRODUCTION

Cysts are the most common benign lesions of the kidneys. Although solitary renal cysts are common, infection of renal cysts is rare, with an incidence rate of 2.5% [1]. Simple asymptomatic cysts are harmless and do not require therapy. The most common problem with cysts is the need to distinguish them from neoplasms [2]. Most cysts can be diagnosed with ultrasound and computed tomography (CT) scan. Rarely, a complex cyst or a cyst with cells resembling that of carcinoma may be present.

Simple renal cyst infection usually occurs as a complication of bacteriuria and ascending infection [3] or hematogenous spread [4]. Yet, it can also occur as a result of iatrogenic cyst instrumentation [5]. It is difficult to distinguish infected renal cysts from renal abscess by sonography or CT scan [6], but the treatment is the same for both conditions, including appropriate antibiotics and percutaneous drainage. Subsequent sclerosing therapy can prevent recurrence of renal cysts [7].

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CASE REPORT

A 65-year-old woman with a past history of diabetes mellitus (DM), hypertension, pulmonary tuberculosis, endometrial carcinoma, chronic renal insufficiency, and a left renal cyst was admitted following 4 days of persistant abdominal pain.

A huge cystic lesion in the left kidney was noted during prior hospitalization (January 17 to January 22, 1998). Aspiration was suggested at that time, but she refused. She did not complain of any discomfort for the following 2 years.

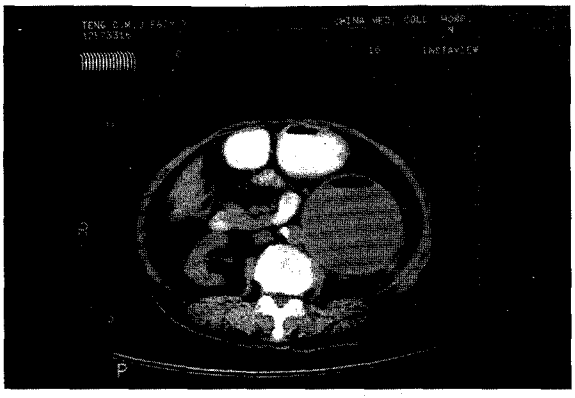

Fig. 1 Abdominal computed tomography showing a huge cyst with air fluid level on the left kidney.

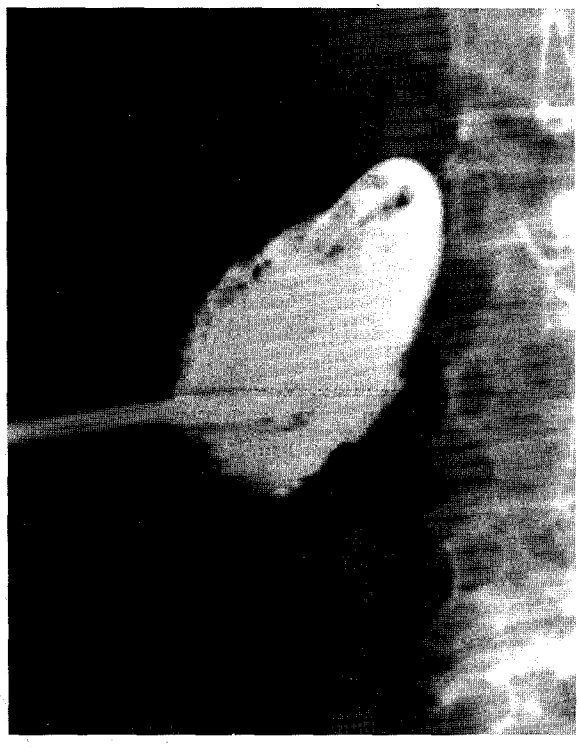

Fig. 2 Percutaneous drainage revision.

She began to suffer from left flank soreness in March 2000. She received percutaneous drainage (pig tail tube insertion) at a local hospital. The drainage tube was left in for about 2 months, during which time she began to suffer from abdominal pain and visited our out-patient department for further evaluation and treatment. Symptoms included dull abdominal pain, abdominal fullness and abdominal tenderness. Stool and urine passages were normal. No chest tightness, dyspnea, fever or trauma was noted.

She had chronic hepatitis B, but did not receive regular follow-up for this condition. Stage II endometrial adenocarcinoma and cervical intraepithelial neoplasm were previously diagnosed. She also had diabetes mellitus for more than 10 years. She received oral hypoglycemic agents (Euglucon 5 mg 1# tid), and her average glucose level was kept at 150 mg/dL. No acute complications were observed. However, hypertension developed 3 years prior to this admission, for which she took antihypertensive agents. In addition, she had chronic renal insufficiency for 3 years. During the last hospitalization, she presented with left hydronephrosis and hydroureter, but neither renal stones nor abnormal bladder were noted. Her creatinine clearance rate was 14.3 c.c. /min.

On examination at our hospital, she appeared acutely ill. The following values were noted: blood pressure, 127/71 mmHg; pulse rate, 110 beats/min; respiratory rate, 16-beats/min; body temperature, 37.7 °C. Warm extremities and good skin turgor were noted with no cyanosis. Pale conjunctiva and icteric sclera were found. Her breathing was clear and heart beat was regular without murmur. Abdominal distension was noted with hypoactive bowel sounds and tenderness but no rebounding pain. There was no Murphy's sign or knocking flank pain. Extremities showed bilateral pitting edema.

Laboratory studies yielded the following values: white cell count, 14300/μl (neutrophil 88.5%); hemoglobin, 7.8 gm/dL; blood nitrogen urea (BUN), 32 mg/dL; creatinine (Cr), 2.6 mg/dL; glucose, 260 mg/dL; albumin, 2.3 g/dL; potassium, 3.1 meq/L. Urine analysis revealed proteinuria (> 300 mg/dL) and microscopic hematuria (8-10/HPF).

The symptoms and signs included abdominal pain, fever, tachycardia and leukocytosis. Infection of a renal cyst was suspected (Fig. 1); the drainage tube (pigtail) was the most likely source.

We consulted a urologist on May 23, 2000, and empiric antibiotics with cephradine

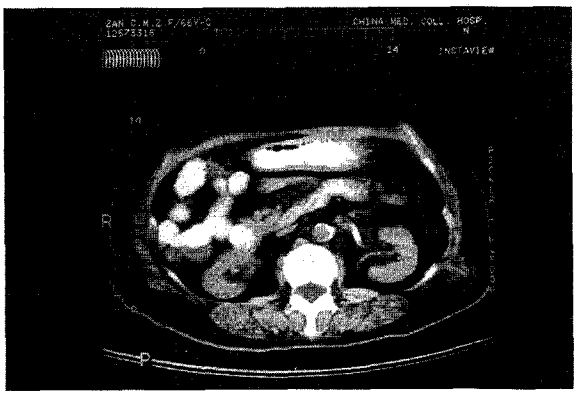

Fig. 3 Abdominal computed tomography showing complete resolution of the cystlc cavity.

and gentamicin were administered. The previous percutaneous drainage tube was removed and tip culture yielded *Enterococcus* and *Morganella morganii.* The urine and blood cultures were negative. In addition, acid fast stain was negative, and no fungus or TB was cultured.

We consulted a radiologist for percutaneous drainage (Fig. 2) which yielded 270 mL of thick, yellowish-gray pus. The pus culture was positive for *Morganella morganii.* Medication was switched to Cefepime 2.0-g IV qd. (She received Cephradine and Gentamicin on admission. This was later changed to Amikin by an infectious disease specialist, and then changed again to Cefoxitin.) After the procedure, a residual cavity of 3 cm × 5 cm was noted with dirty debris and no communication with the collecting system. Eight days later, abdominal CT scan showed a completely resolved abscess cavity (Fig. 3) with evidence of low-density foci in the uterus and cervix. Findings for liver, spleen, pancreas, and both kidneys were normal, and there was no evidence of ascites. The patient was discharged on June 24, 2000 and followed-up at the out-patient department.

DISCUSSION

Renal cysts are abnormal, fluid-filled sacs that arise in the renal parenchyma. They begin as ether dilatation or outpouching from existing nephrons or collecting ducts, or from the developmental counterparts of these structures. These lesions are usually lined by an epithelium that is probably continuous and usually has a primitive or simplified morphologic appearance [8].

Renal cysts may be single or multiple and can be found in one or both kidneys. The most common problem associated with renal cysts is the need to distinguish them from neoplasms [2]. Patients with chronic renal failure and those treated by hemodialysis have an increased incidence of acquired cystic disease of the kidneys. Carcinomas have been found in up to 6% of reported renal cysts.

Spontaneous infections of preexisting solitary renal cysts and autosomal dominant polycystic kidney disease have been described [5,9-11]. The most common etiological agents are Gram-negative uropathogens that are thought to have infected the cysts as a consequence of bacteriuria and ascending infection. Infection may also occur as a result of iatrogenic cyst instrumentation.

The clinical manifestations of renal cyst infections include nausea, vomiting, fever, chills, flank pain, abdominal pain and dysuria. Diagnosis is made radiologically. Renal echography showing fluid collection with contained echoes usually indicates a complicated cyst. The CT scan shows a localized area of reduced attenuation that does not enhance after intravenous contrast. Gallium or indium images may help to identify the infected cyst in patients with polycystic kidneys. It is difficult to distinguish between an infected solitary cyst and a cortical renal abscess on the basis of symptoms, signs and renal images alone [6]. A definite diagnosis can be made by ultrasound or CT-guided percutaneous cyst puncture with culture [12]. Usually, the aspirated culture of the infected renal cyst yields enterobacteria, and the renal carbuncle yields *staphylococcus.* The pus culture in this case revealed *Enterococcus* and *Morganella morganii*, and the possible cause of infection was previous iatrogenic cystic instrumentation.

Simple asymptomatic cysts are harmless

and do not require therapy. Occasionally, cysts can grow and become large enough to cause symptoms and signs. The management of symptomatic renal cysts involves percutaneous aspiration. A sclerosing agent can be instilled into the cavity in an attempt to prevent recurrence. Cysts greater than 500 mL in volume are usually drained surgically. Laparoscopic methods are now used routinely. Treatment of infected cysts includes percutaneous drainage with 2 weeks of appropriate antimicrobial therapy. The appropriate treatment depends on the use of antibiotics that are able to concentrate within the infected cysts, in addition to providing bactericidal activity against the infecting organism. Aminoglycosides, penicillins, and cephalosporins have relatively poor penetration into renal cysts [13-15]. These antibiotics are relatively lipophobic and do not diffuse across cystic epithelial layers [13-17]. Lipophilic agents, such as clindamycin, chloramphenicol, macrolides, metronidazole, and trimethoprim, are able to penetrate and accumulate within cysts. Fluoroquinolone antibiotics do accumulate in cystic fluid and most of the causative organisms in infected renal cysts are facultative Gram-negative bacilli with quinolone susceptibility: these agents are the drugs of choice [18-20].

In addition, infected renal cysts can be distinguished from perirenal and pararenal abscesses by echography and CT scan. Usually, renal cysts are well defined, but perirenal abscesses are composed of perinephric fluid collection with infection, which displaces the kidney and causes loss of the renal outline. The pararenal abscesses present as a round columnar shape that may extend to the pelvic area [21].

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感染性腎囊腫：一病例報告

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單一腎囊腫的感染通常是菌尿症的上行性感染，但亦有因醫源性的腎囊腫穿刺而造成感染。臨床上，感染性腎囊腫與腎皮質膿瘍不易區別，他們的徵候症狀甚至超音波、電腦斷層檢查皆不易區別，一開始它可表現像腹部腫塊，因此，必須排除惡性腫瘤的可能。我們報告這位65歲的女性，之前即有巨大的腎囊腫，接受經皮穿刺引流，但併發感染，入院後，接受抗生素及膿瘍引流，排除惡性腫瘤及廔管的形成，治癒後出院。因爲臨床上時常遇到腎囊腫，處理時應避免感染的發生，所以提出此病例來引起大家注意。

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關鍵詞

感染性腎囊腫，腎皮質膿瘍，經皮穿刺引流

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