Pyonephrosis: Fatal “Fluid” in the kidney

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ABSTRACT

We reported a case of pyonephrosis with a left renal stone. While reviewing its causes and management, the key features of pyonephrosis on image studies was presented. We stressed on the importance of an early diagnosis by image studies in the subsequent management of pyonephrosis, which requires prompt decompression of the collecting system in order to avoid catastrophic complications.

Key words: Pyonephrosis, hydronephrosis, nephrolithiasis, kidney infection, imaging.

INTRODUCTION

A 54-year-old man with uncontrolled diabetes mellitus and one-week history of left lower back pain was presented with fever, chills and dysuria for a few days. Physical examination revealed a left costovertebral angle knocking pain. Laboratory examinations showed leukocytosis (12,720 white blood cells per microliter blood) and numerous white blood cells in urinalysis. Abdominal ultrasonography revealed an enlarged left kidney with a dilated pelvis filling with low-level echogenic foci. Further computed tomography with (Figure 1a) and without (Figure 1b) contrast material demonstrated a dilated collecting system with heterogeneous fluid of higher attenuation values than water (black arrowhead) in the left kidney, which resulted from the obstruction of a large stone (white arrowhead) at the left ureteropelvic junction. The wall of the collecting system was thickened and enhanced, and the perirenal space was dirty (white arrow). Under the impression of pyonephrosis, a pigtail nephrostomy was placed in addition to intravenous antibiotic treatment. The nephrostomy drained out hundreds of milliliters of viscous grayish pus initially, and the pus culture, as well as, the urine culture yielded Proteus mirabilis. A few days later, the nephrostomy became obstructed. In order to eradicate the infection focus within the left kidney, the patient was transferred to National Taiwan University Hospital (a tertiary teaching hospital), where he received a left radical nephrectomy. His post-operative course was uneventful during the 6-year follow-up period dated till now.

Pyonephrosis, though uncommon in adult, is a serious infection of a hydronephrotic kidney (Schaeffer et al., 2012). The risk factors for pyonephrosis include an immuno-suppressive status and an anatomic urinary tract obstruction, of which 75% is nephrolithiasis-related (Chen et al., 2008). Because an early diagnosis is paramount for the management of pyonephrosis, prompt image study is necessary to further evaluate patients with urinary tract infections, if they do not have an adequate response to antibiotic therapy (Schaeffer et al, 2012; Chen et al., 2008).

Pyonephrosis might be differentiated from hydronephrosis on ultrasonography by the presence of debris, fluid-fluid levels, and internal echoes in the collecting system (Schaeffer et al, 2012; Das et al, 2014; van Nieuwkoop et al, 2010). Computed tomography is extremely useful in diagnosing pyonephrosis with the following criteria that include its key features: (1) a thickened wall of the renal pelvis greater than 2 mm; (2) the presence of pelvic contents and debris, and (3) the parenchymal and perirenal findings indicative of an...
A B

Figure 1. (A) The computed tomography with and (B) without contrast enhancement demonstrated a large stone (white arrowhead) at the left ureteropelvic junction and a dilated collecting system with heterogeneous fluid with higher attenuation values than water (black arrowhead) of left kidney. The wall of the collecting system was thickening and enhanced and the perirenal space was dirty (white arrow).

infection (Chen et al., 2008; Das et al., 2014).

Besides antibiotic treatment, urgent drainage of the purulent exudates to decompress the collecting system is the mainstay of treatment (Schaeffer et al., 2012). Prompt treatment results in a good prognosis for the patient, whereas delayed management can lead to renal and perinephric abscesses, sepsis and even death of the patient (Schaeffer et al., 2012; Chen et al., 2008).

REFERENCES


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