Urinary Tract Infection Requiring Nephrectomy in a Patient with Autosomal Dominant Polycystic Kidney Disease despite Ciprofloxacin Therapy

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Dear Sir,

Complicated urinary tract infections (UTIs) are among the well-defined indications for nephrectomy in patients with autosomal dominant polycystic kidney disease (ADPKD) [1]. Introduction of quinolones into clinical practice has offered a therapeutic advantage for such infections because their penetration into the cyst fluid is better than that of other antimicrobials [2]. Another aspect of UTIs in patients with ADPKD is the necessity to localize the site of infection before surgical or percutaneous drainage. Several noninvasive methods including scinti-graphy and CT scans have been suggested with varying degrees of sensitivity [3, 4]. We observed a UTI due to *Klebsiella pneumoniae* in a patient with ADPKD which did not respond to 8 weeks of ciprofloxacin treatment and eventually required nephrectomy. A magnetic-resonance imaging (MRI) prior to surgical intervention failed to define the exact site of infection.

A 45-year-old woman with ADPKD was admitted to the intensive care unit because of right flank pain, fever, acidosis, azotemia and seizures. Initial diagnosis of ADPKD extended back to her pregnancy which took place 12 years earlier. She gradually developed end-stage renal failure during the following 8 years. Her urine output and crea-tinine values were stable at 3 liters/day and 450 $\mu\text{mol/l}$, respectively. She was treated with protein restriction, essential amino acid ta-

Fig. 1. MRI scan demonstrating bilateral enlarged polycystic kidneys with thinned cortices. Both kidneys contain complicated cysts with dense cyst fluids.

blets, calcium carbonate and was not dialyzed. Her laboratory values at admission were as follows: BUN 16.2 mmol/l, creatinine 520 $\mu\text{mol/l}$, sodium 118 mmol/l, pH 7.12, pO₂ 15.1 kPa, bicarbonate 3 mmol/l, WBC 28×10^9 cells/l. There were 3,600 PNLs/ml in sterile urine examination and gram-negative bacteria. Intravenous ciprofloxacin 200 mg/day was initiated and the patient was dialyzed via a femoral catheter. Urine cultures grew *K. pneumoniae* which was susceptible to ciprofloxacin according to disk diffusion tests and minimal inhibitory concentration values (MIC = 0.125). Ultrasonographic examination revealed enlarged polycystic kidneys with hyperechogenic cysts in the right kidney.

Fig. 2. Cross-section of the nephrectomy material showing cysts filled with pus.

She failed to respond to this treatment, and cyst aspirates from the right kidney under ultrasonographic guidance yielded the same microorganism in the 2nd week of treatment. She was dialyzed regularly via a subclavian vein. Fever, leukocytosis, pyuria persisted, and repeat cultures yielded the same microorganism with slightly increasing MIC values despite 4 weeks of intravenous ciprofloxacin treatment. In order to define the definite site of ongoing infection, an MRI was ordered. It showed bilateral enlarged polycystic kidneys with complicated cysts containing dense cyst

fluid in both kidneys and failed to discriminate the infected cysts (fig. 1). She developed hypotension, spiking fever and macroscopic hematuria in the 7th week of therapy with positive urine cultures, and ceftazidime 1 g/ day intravenously was added to her treatment. Right nephrectomy was carried out and a polycystic kidney with a thinned cortex and cysts filled with pus was observed on macroscopic examination (fig. 2). She remained afebrile after surgery and urine cultures were negative during the ensuing 2 weeks. She developed thrombosis of the left subclavian vein

and died of pulmonary complications 3 weeks after the operation.

Our observations suggest that although noninvasive diagnostic methods including MRI are of value in defining the site of infection in polycystic kidneys, none of them have proved themselves as sensitive techniques. The clinical course of this particular patient also implies that although quinolones offer a therapeutic advantage in the treatment of UTIs in patients with ADPKD, they do not obviate the necessity of surgical treatment in certain cases.

References

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