

Infected kidney stone progressing to perinephric abscess and thoracic empyema

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A perinephric abscess can result from complications of pyelonephritis or hematogenous spread of infection. An abscess is usually diffuse liquefaction between the Gerota's fascia and renal capsule. Symptoms are nonspecific and usually include flank pain, fever and sometimes dysuria. Laboratory evidence of pyuria and proteinuria may also be present. Inflammatory markers including ESR and CRP are usually elevated and should be considered in a patient who does not improve despite appropriate antibiotics therapy. CT with contrast is the best imaging modality for diagnosis of perinephric abscess and evaluation of abscess extension into surrounding organs (1).

Regardless of their site and origin, renal parenchymal abscesses may evolve in one or more of the following ways: perforation of the renal capsule and formation of perinephric abscess, extension toward the renal pelvis and drainage into the collecting system or development into a chronic abscess.

The diaphragm is normally an effective barrier to the spread of infection. Approximately 15% of subdiaphragmatic abscesses are complicated by empyema (2). When subphrenic abscess is complicated by transdiaphragmatic spread of infection, there is a significant increase in both mortality and morbidity.

Empyema following abdominal infection has been described but the pathobiological mechanism is poorly understood. There has been considerable debate in the past about the method of spread of infection from the abdomen to the chest. In 1929, Lemon and Higgins showed that spread from subphrenic abscess can be by bacterial migration through lymphatics (3). Harley (1955) believed that infection does not pass through the diaphragm by the lymphatics and that empyema is always the result of direct rupture of an abscess through the diaphragm into the pleural cavity (4). The possibility of septicaemic spread to the lung and pleura also makes the lymphatic transfer hypothesis uncertain. Subphrenic abscess is the most common origin of pleural empyema from below the diaphragm.

In this case the result of culturing abscess material, obtained by surgical drainage revealed *Citrobacter Koseri*. *Citrobacter*, a member of the Enterobacteriaceae family,

comprises a group of aerobic, Gram-negative bacilli that are frequently found in water, soil, food and animal and human intestines (5). The most common sources of *Citrobacter* are urine, sputum and soft tissue exudates (6). The usual sites of *Citrobacter* infection include the urinary tract (39%), gastrointestinal tract (27%), wound or decubitus (10%) or other sites (11%) (7). *Citrobacter* infections are usually found in compromised hosts, patients aged > 60 years and neonate (8). The infections usually occur in inflamed or shocked tissue before bacteremia takes place. *C. koseri* is intrinsically sensitive to antibiotics active against Gram-negative bacilli except for amino- and carboxypenicillins (9).

Treatment of perinephric abscesses are usually done with antibiotics by intravenous route, and drainage of the abscess, if the abscess is small and there is pus out of the urine, the placement of a double "J" catheter can be enough. The percutaneous route by needle where the collection of liquid or pus is aspirated, or the nephrostomy placement is another good alternative; only in cases where drainage is not adequate or as it happened in this case where the involvement was massive, nephrectomy is necessary (10).

REFERENCES

1. Yen DH, Hu SC, Tsai J, et al. Renal abscess: early diagnosis and treatment. *Am J of Emerg Med.* 1999; 17:192-7.
2. Konvolinka CW, Olearczyk A. Subphrenic abscess. *Curr Probl Surg.* 1972; 9:1-51.
3. Lemon WS, Higgins GM. Lymphatic absorption of particulate matter through the normal and the paralysed diaphragm: an experimental study. *Am J Med Sci.* 1929; 178:536-47.
4. Harley HRS. Subphrenic abscess with particular reference to the spread of infection. *Ann R Coll Surg Engl.* 1955; 17:201-25.
5. Tallez I, Chrysant GS, Dismukes WE. *Citrobacter diversus* endocarditis. *Am J Med Sci.* 2000; 320:408-410.
6. Lipsky BA, Hook EW 3rd, Smith AA, Plorde JJ. *Citrobacter* infections in humans: experience at the Seattle Veterans Administration Medical Center and a review of the literature. *Rev Infect Dis.* 1980; 2:746-760.

7. Letter to the Editor: *Citrobacter koserii* infection and abscess associated with Harrington rods. *Am J Infect Control*. 2004; 32:372-374.

8. Drelichman V, Band JD. Bacteremias due to *Citrobacter diversus* and *Citrobacter freundii* : incidence, risk factors and clinical outcome. *Arch Intern Med*. 1985; 145:1808-1810.

9. El Harrif-Heraud Z, Arpin C, Benliman S, Quentin C. Molecular epidemiology of a nosocomial outbreak due to SHV-4-producing strains of *Citrobacter diversus*. *J Clin Microbiol*. 1997; 35:2561-2567.

10. EL-Nahas AR, Faisal R, Mohsen T, et al. What is the best drainage method for a perinephric abscess? *International Brazilian Journal of Urology*. 2010; 36:29-35.

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