Achromobacter denitrificans renal abscess

Alessio Sgrelli1, Antonella Mencacci2, Maurizio Fiorio1, Cristina Orlandi3, Franco Baldelli1, Giuseppe Vittorio Luigi De Socio1

1Department of Infectious Diseases “Santa Maria della Misericordia” Hospital, University of Perugia, Perugia Italy; 2Department of Microbiology “Santa Maria della Misericordia” Hospital, University of Perugia, Perugia Italy; 3Department of Radiology “Santa Maria della Misericordia” Hospital, University of Perugia, Perugia Italy

INTRODUCTION

Renal abscess can arise from both an initial urinary tract infection (UTI) and haematogenous spreading of bacteria from a primary focus of infection outside the kidney (Anderson et al., 1980, Hutchison et al., 1988, Coelho et al., 2007). Generally, renal abscess due to UTI is often coupled with urinary tract abnormalities including vesico-ureteral reflex, nephrolithiasis and urinary tract obstruction (Anderson et al., 1980, Hutchison et al., 1988, Coelho et al., 2007). In those cases, enteric gram-negative bacteria are the typical infecting organisms (Anderson et al., 1980, Hutchison et al., 1988, Dembry et al., 1997, Coelho et al., 2007). To our knowledge, Achromobacter denitrificans renal abscess has never been reported.

CASE REPORT

We describe here a 66-year-old Italian man, who complained of fever (38°C) and a fistula in his right lumbar region in October 2010. In his medical history he reported hypertension, moderate renal insufficiency, prostatic hyperplasia and bilateral renal stones. In 2004 he had been treated elsewhere for right renal abscess and cutaneous fistula with piperacillin-tazobactam 4.5 g for three times a day for 1 month and subsequently surgical drainage with apparent resolution of the infection. In 2008, for recurrence of right renal abscess he received levofloxacin 500 mg once daily for 15 days and apical right kidney resection. The etiology of renal abscess was undefined.

In September 2010 the cutaneous fistula recurred and a radiologic study disclosed a nephro-cutaneous fistula. In October 2010, the patient came under our observation because he complained of fever (38°C) and a discharging fistula in his right lumbar region. All the past radiological examinations showed the persistence of bilateral renal stones without significant pelvic dilatation. At hospital admission the examination showed three fistulae in the right lumbar region.

The laboratory examinations showed: ESR 120, CRP 10.5 mg/dL, white blood cell count 11,100 µL (neutrophils 70%), platelets 333,000/µL, creatinine 1.54 mg/dL, clearance creatinine 48.2 mL/min. Other routine examinations resulted normal. HIV serology was negative. Abdominal CT scan on admission disclosed a right kidney abscess of 7.0×3.0×4.0 cm with a nephro-cutaneous fistula (Figure 1).
Purulent exudate samples were obtained from both the draining fistula and a CT-guided needle-aspiration of the abscess, performed for diagnostic and therapeutic purposes. Both samples showed numerous polymorphonuclear leukocytes without bacteria at gram staining, cultures were positive for *Achromobacter denitrificans*, and negative for anaerobic bacteria or fungi. The bacterium was isolated on chocolate, 5% sheep blood, and MacConkey agar plates (Becton Dickinson, Milan, Italy). It was nonfermenter, oxidase-positive, indole-negative, and grew on Salmonella-Shigella agar (Becton Dickinson). Identification was carried out with API 20NE (bioMérieux, Marcy l’Etoile, France) and the Phoenix (Becton Dickinson) systems. The isolate was susceptible to colistin, imipenem, meropenem and piperacillin-tazobactam by overnight MIC macro-method.

We deduced that this infection was due to recurrent renal infections linked to a history of stones. The patient was treated with meropenem 1 g three times daily for 60 days. Fever disappeared after 4 days of therapy, and CRP progressively improved.

Considering the compromised renal function, and the good response to antimicrobial therapy, the surgeon did not recommend surgery. The patient was still well at a follow-up visit 8 months later.

**DISCUSSION**

*Achromobacter denitrificans* is a gram negative bacterium formerly known as *Alcaligenes denitrificans* and only recently classified as *Achromobacter* (Coenye et al., 2003).

*Achromobacter xylosoxidans* and *denitrificans* are mobile, strictly aerobic, ubiquitous bacteria not fermenting glucose, oxidase and catalase positive. These bacteria are present in soil and water and only rarely cause human infections (Weitkamp et al., 2000). *Achromobacter xylosoxidans* is the most clinically important species isolated from human samples. The micro-organism has been implicated in nosocomial infective hotbeds associated with the infusion of contaminated solutions (haemodialysis, intravenous solutions) or with the use of humidifiers and incubators (Weitkamp et al., 2000, Ahmed et al., 2009). In infected patients, this bacterium has occasionally been isolated from the blood, peritoneum, pleural liquid, sweat, respiratory secretions and urine (Weitkamp et al., 2000, Ahmed et al., 2009).

The identified risk factors for *Achromobacter* infection are: immunodeficiency, HIV infection, malignancy, cystic fibrosis and hospitalization (Weitkamp et al., 2000, Hansen et al., 2009). Community acquired infections are rarely observed in patients with cystic fibrosis (Davies et al., 2007, Hansen et al., 2009).

Most of the infections by *Achromobacter* are asymptomatic. The symptomatic infection includes cases ranging from natural-valve or prosthetic valve endocarditis to meningitis, pneumonia, peritonitis, conjunctivitis, osteomyelitis, intra-abdominal abscess, and prosthesis infections (Appelbaum et al., 1980, Ahn et al., 2004, Teng et al., 2009, Lucatelli et al., 2009).

To our knowledge, renal abscess cases from *Achromobacter denitrificans* have never been described in medical literature before.

Bacteremia, often linked to the presence of a bladder catheter (Ahmed et al., 2009), is the most common infection caused by this organism and is sometimes polymicrobial. In 28% of cases it presents as co-infection with coagulase-negative staphylococci (Gómez-Cerezo et al., 2003). The mortality rate of *Achromobacter xylosoxidans* infections ranging from 3% for primary bacteremia or catheter-related infections, to 80% in severe neonatal infections (Ramos et al., 1996,
Weitkamp et al., 2000). It is increased in patients over 65 years old, in neutropenic subjects and in nosocomial and/or polymicrobial infections. Although high levels of resistance to cephalosporin, aminoglycoside, and quinolone have been reported (Weitkamp et al., 2000), Achromobacter is usually sensitive to common antibiotics like cotrimoxazole, piperacillin-tazobactam, meropenem and ceftazidime. If therapeutic drainage is believed to involve considerable risk, then intravenous antimicrobial therapy may be a good alternative treatment in patients without immunocompromisation.

REFERENCES


