Achromobacter denitrificans renal abscess

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SUMMARY

We describe a case of a 66-year-old immunocompetent man affected by *Achromobacter denitrificans* renal abscess related to renal stones. The patient was treated successfully with meropenem 1 g three times daily for 60 days. To our knowledge, this is the first ever case reported of *Achromobacter denitrificans* renal abscess.

KEY WORDS: Achromobacter denitrificans, Renal, Abscess

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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).

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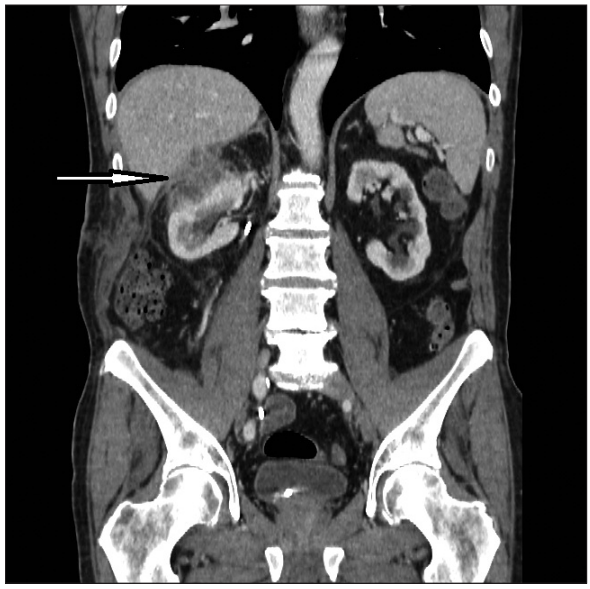

FIGURE 1 - *Coronal reconstruction of the abdominal CT scan showing a right kidney abscess.*

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 bacteriemia 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.

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