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Short Communication

Recurrent psoas abscess due to *Pseudomonas aeruginosa*: A case report

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Recurrent secondary psoas abscess due to *Pseudomonas aeruginosa* is a relatively rare disease. Diagnosis is often easy through appropriate investigations but the treatment may be difficult, especially in patients with severe underlying conditions. We report a case of recurrent psoas abscess due to *P. aeruginosa* in same focus after osteosynthesis for kyphoscoliosis. A 65 years old man suffered in post-operative course of recurrent psoas abscess due to *P. aeruginosa* with relapse intervals of 6 and 2 years. As patient's condition was a contraindication to the ablation of the osteosynthesis material, we set up a regimen combining percutaneous computed tomography (CT) drainage with antibiotic therapy by ceftazidime after the second relapse. The successful therapeutic regimen established to overcome the patient's problem is underlined. The treatment of psoas abscess involves the use of appropriate antibiotics in association with percutaneous or surgical drainage. In case of recurrence associated to surgical contraindication, ceftazidime in prolonged administration as performed in our case could be useful.

Key words: Psoas abscess, recurrence, antibiotherapy, ceftazidime.

INTRODUCTION

Psoas abscesses are relatively rare. They can be primary or secondary to numerous causes. Psoas abscess caused by *Pseudomonas aeruginosa* is rare (Baier et al., 2006; Charalampopoulos et al., 2009). We report an original case of recurrent secondary abscess due to *P. aeruginosa*. This occurred in post-operative course in 6 and 2 years intervals.

Case

A 65 years old man was admitted to the Rabat military teaching hospital for kyphoscoliosis. He underwent surgical operation: laminectomy and stabilization with anterior and posterior internal fixator. The post-operative course was complicated by pulmonary embolism treated by anticoagulants. The evolution was characterized by a psoas hematoma infected by *P. aeruginosa*. Percutaneous CT-guided drainage was performed combined to antibiotics. 6 years later, the patient developed left iliac pain and inflammatory signs on the anterior drainage scar. CT was carried out and revealed a retroperitoneal collection along psoas in direct contact with the fixator (Figure 1). The inflammatory markers were increased with CR protein of 130; neutrophil count high (16 G/L); low rate of prothrombin and an increased activated partial thromboplastine level. Liver function tests and blood electrolytes were normal. The patient was given broad spectrum antibiotics including amoxicillin-clavulanic acid and gentamicin. A percutaneous CT-guided drainage collected 1000 ml of yellow pus. A continuous irrigation and drainage was performed. For microbiological findings: direct examination showed monomorphic bacterial flora: gram-negative bacilli sometimes grouped in palisade. *P. aeruginosa* was isolated from pus. Bacterial identification was performed

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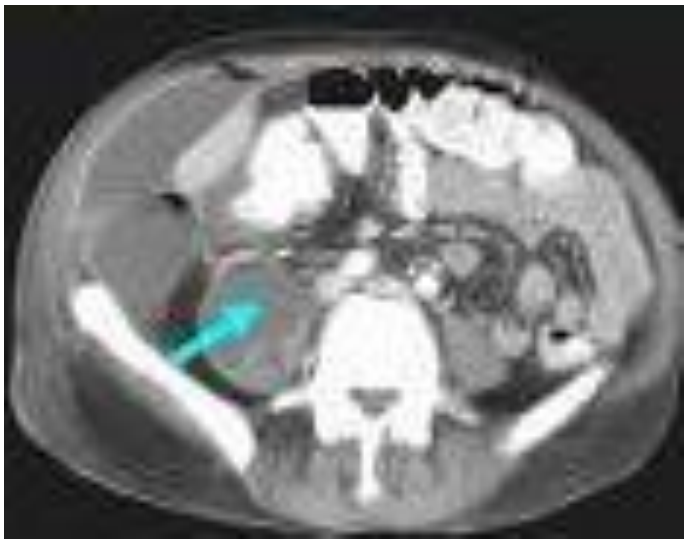

Figure 1. Left psoas abscess revealed by CT-scan.

using standard microbiologic tests: gram staining, colonial morphology, production of oxidase, growth at 42°C, api 20NE system (BioMérieux, Marcy l'Etoile, France). The strain found was non-serotypable. The antibiogram was carried out by disk diffusion method according to the recommendations of the French Society of Microbiology (Soussy, 2010). Our strain was resistant to: ticarcillin (75 µg), piperacillin (75 µg), cefsulodin (30 µg), imipenem (10 µg), gentamicin (15 µg), tobramycin (10 µg), netilmicin (30 µg), levofloxacin (5 µg), ciprofloxacin (5 µg) and fosfomycin (50 µg); intermediate to: ticarcillin + clavulanic acid (75/10 µg), amikacin (30 µg) and sensitive to: piperacillin + tazobactam (75/10 µg), ceftazidime (30 µg), cefpirome (30 µg), aztreonam (30 µg) and colistin (50 µg).

The patient was under ceftazidime using intravenous route 1 G every 4 h during 6 weeks and amikacin (1,5 G 1x/day) during 7 days combined to percutaneous CT-guided drainage. Patient's condition was incompatible to anesthesia (major heart failure). Thus a surgery was excluded for ablation of the material. The outcome was favourable with disappearance of the clinical and biological syndroms. The patient relapsed 2 years after the first recurrence. Microbiological exams found the same strain of *P. aeruginosa* as the one previously isolated with same characteristics and antibiotype.

DISCUSSION

Psoas abscesses can be primary, following septicemia with hematogenous diffusion or secondary to local infections (gastrointestinal, genitourinary, arthritis and joint infections) (Debes et al., 2006). *Staphylococcus aureus* is the main bacterium in primary abscesses (Baier et al., 2006; Charalampopoulos et al., 2009). The incidence of secondary psoas abscesses increases with frequent invasive procedures on the spine (Mückley et al., 2002; Audia et al., 2006). Pathogens isolated in this case are mixed, with gram-negative bacilli like *Escherichia coli*, *Bacteroides species* and rarely *P. aeruginosa*. The relapse is usually caused by the same pathogen and exceptionally by two different pathogens (Jeon et al., 2007). In our study, *P. aeruginosa* was isolated in post spinal surgery. The recurrent relapse can be explained by the ability of pathogens to establish a biofilm on the material surface. *P. aeruginosa* is an opportunistic bacterium causing a wide variety of nosocomial infections (Schreiber et al., 2007; Eschbach et al., 2004). *P. aeruginosa* is usually described as a bacterium which prefers aerobic growth conditions (Schreiber et al., 2007; Eschbach et al., 2004). However, recent data obtained from chemostat experiments suggest that the organism tries to establish a microaerobic milieu for optimal growth. Under oxygen-limiting conditions, *P. aeruginosa* grows in the presence of nitrate or nitrite by using denitrification. In the absence of nitrate or nitrite, arginine serves as an energy substrate for anaerobic growth. Without arginine or an alternative electron acceptor in the anaerobic growth medium, *P. aeruginosa* utilizes the conversion of pyruvate into acetate and lactate for long-term survival (Schreiber et al., 2007; Eschbach et al., 2004).

In *P. aeruginosa*, acyl-homoserine-lactone quorum sensing (acyl-HSL QS) regulates the expression of virulence factors and biofilm formation in response to cell density. The mechanisms of this resistance are not completely explained but the formation of a biofilm seems to be the main cause of survival and persistence of *P. aeruginosa* (Schreiber et al., 2007; Eschbach et al., 2004). In combination with antibiotherapy, the treatment of psoas abscess included drainage. This drainage can be percutaneous under CT guidance or less often, surgically. The percutaneous drainage success ranges from 83 to 100% (Conde et al., 2000). The percutaneous drainage is proposed in first intention because less invasive with a clinical, biological and radiological monitoring. In case of failure or bulky multi-locular abscess, the surgical drainage is indicated (Conde et al., 2000). In our study, the possibility of a failure of percutaneous drainage performed during the first hospitalization could be what happened. The hypothesis would be the persistence of *P. aeruginosa* by formation of a biofilm explaining the recurrence of the infectious process. Because recurrent isolate had same antibiotype, the intermediate susceptibility to amikacin could not be a cause of relapse apparently. As patient's condition was a contraindication for the removal of the material, percutaneous computed tomography (CT) drainage was performed combined to antibiotherapy. In order to prevent a new relapse after a second episode and in waiting for surgery for material ablation, a prolonged

antibiotherapy by ceftazidime alone 4 G per day was performed. Follow-up 6 months later revealed no abscess recurrence.

CONCLUSION

Psoas abscess due to *P. aeruginosa* is a relatively rare disease. We reported a case of recurrent psoas abscess due to *P. aeruginosa* with relapse intervals of 6 years and 2 years. It illustrates a long term anaerobic survival of *P. aeruginosa.* While the patient was not able to undergo surgery to remove the material, a prolonged antibiotherapy by ceftazidime was performed with success to avoid recurrence.

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