ARTICLE ORIGINAL

A case of necrotizing fasciitis caused by *Streptococcus canis* in a drug addict patient

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Abstract

Bêta-hemolytic group G streptococci are mainly classified into *Streptococcus dysgalactiae* subsp. *equisimilis* and *Streptococcus canis*. It causes pyogenic infections in humans and animals, essentially dogs and cats. Several publications have associated group G *Streptococcus* with sepsis, skin and soft tissues infections in humans.

We report herein an unusual case of necrotizing fasciitis due to *Streptococcus canis* in a 40 years-old drug- user diabetes men suffering from chronic hepatitis C. The patient was admitted initially for the management of an abscess in the external section of the knee which dates back to 7 days with local inflammatory signs. He was operated. The cyto-bacteriological examination of the reduced pus identified *S. canis* sensitive to all antibiotics tested. The patient was first managed with amoxicillin and clavulanic acid (3g / day intra-venous). One week later the deterioration of his condition required another surgery in emergency with discovering of an extensive necrotizing fasciitis which required excision of necrotic tissue and the change of antibiotic. The evolution showed an improvement in the wound condition and a good biological assessment.

Key words : *Streptococcus canis, drug addict, group G streptococci, necrotizing fasciitis, pyogenic*

Résumé

Les streptocoques Bêta-hémolytiques du groupe G sont principalement classés en *Streptococcus dysgalactiae* subsp. *equisimilis* et *Streptococcus canis*. Ils peuvent causer des infections pyogènes chez les humains ainsi que les animaux, essentiellement les chiens et les chats. Plusieurs cas de bactériémies, d'infections de la peau et des tissus mous ont été publiés. Nous rapportons ici un cas inhabituel de fasciite nécrosante à *Streptococcus canis* chez un toxicomane âgé de 40 ans, diabétique sous insuline et atteint d'hépatite C chronique. Il a été admis initialement pour le traitement d'un abcès dans la partie externe du genou qui remonte à 7 jours. Le patient a été opéré. L'examen cytobactériologique de pus ramené a identifié un *Streptococcus canis* sensible à tous les antibiotiques testés. Le patient a d'abord été traité avec de l'amoxicilline- l'acide clavulanique et gentamycine sans amélioration. La découverte d'une fasciite nécrosante a nécessité une reprise chirurgicale d'urgence avec l'excision du tissu nécrotique. L'association céfotaxime et Rifampicine a abouti à la cicatrisation de la plaie et à une bonne évolution biologique.

Mots-clés : *Streptococcus canis, toxicomane, Streptocoques du groupe G, fasciite nécrosante, pyogène, céfotaxime- rifampicine*

Introduction

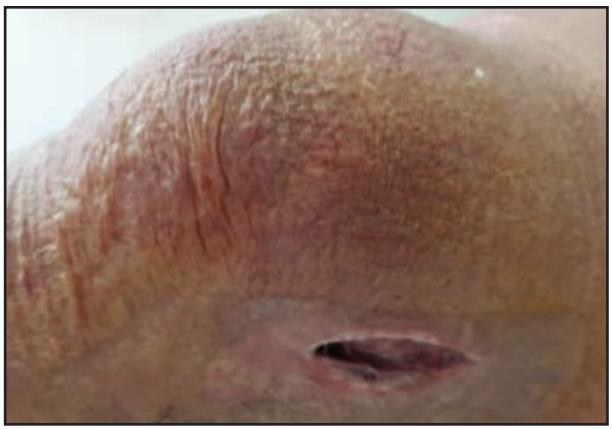
Infectious diseases caused by bêta-hemolytic *streptococci* are in general focused on Lancefield group A (*Streptococcus pyogenes*) and B (*Streptococcus agalactiae*). Group G streptococci are occasionally isolated. Bêta-hemolytic group G streptococci are mainly classified into *Streptococcus dysgalactiae* subsp. *equisimilis* and *Streptococcus canis* (*S. canis*) (1). Veterinarians have long known pathogenicity of *S. canis*. It causes pyogenic infections in animals, essentially dogs and cats (2). It causes respiratory, cutaneous, genital and urinary infections and has also been reported to induce bacteremia and udder infection (mastitis) (3,4,5). In 1996, its human involvement was established in a 77 year old man presenting bacteremia contracted cutaneously (6). Several cases of bacteremia, skin, and soft tissue infections have since been published (7,8,9) mostly in comorbid patients (10). Since then, molecular biology studies have confirmed *S.canis* implication in human pathology (11,12). The patient's history of contact with a dog is critical for the diagnosis of *S. canis* infection (13).

Case report

We report herein an unusual case of necrotizing fasciitis due to *Streptococcus canis*. There was no history or trace of bites. It concerned a 40 years-old man, a drug user suffering from chronic hepatitis C for 10 years with a medical history of tabagism and diabetes mellitus under insulin. He was admitted for the management of an abscess in the external section of the knee (injection site of buprenorphin) which dates back to 7 days with local inflammatory signs (Figure 1 and Figure 2).

Figure 1 : Abscess before surgery

Figure 2 : After draining abscess.



On examination, his temperature was 39°C. Laboratory results disclosed a leukocyte count of 19.280 /mm3 with 16.250 neutrophils/mm^3, an hemoglobin level of 14,7 g/dl, a platelet count of 176 000/mm^3. C-reactive protein was 318,3mg /l (normal range <5 mg/L). He had surgery the next day and the 3-cm open abcess had draining pus with nauseating odorand it was surrounded by a 2-cm rim of erythematous callused skin. The patient was first managed with amoxicillin and clavulanic acid (3g/day intra-venous). The pus was sent to the microbiology laboratory. Its culture was carried out on 10% agar of sheep blood, chocolate blood agar (Polyvitex®) incubated at 37 ° C in an atmosphere enriched with 10% of CO_2 and into an ordinary agar, enrichment broth. Twenty-four hours later, white and smooth colonies surrounded by a zone of beta-hemolysis grew, of which the Gram stain and the vitek system identified as: *S. canis* (99.9%) (Biomerieux, Marcy l'étoile, France). Streptococcal serotyping was positive for group G (Pastorex®, Biorad)

An antibiogram has been carried out and interpreted according to the recommendations of the EUCAST of the current year and relating to *Streptococcus spp*. The following antibiotics were tested: penicillin G, ampicillin, erythromycin, telithromycin, clindamycin, pristinamycin, rifampin, gentamicin, netilmicin, tobramycin, levofloxacin, trimethoprim and sulfamides, chloramphenicol, linezolid, teicoplanin and vancomycin. (14,15). The isolate was sensitive to all antibiotics tested. Therefore, the patient was managed with amoxicillin and clavulanic acid (3 g/day intra-venous) and gentamycin (300 mg/day intramuscular). Two peripheral blood cultures performed at admission became negative. The patient left the hospital the next day.

The evolution was noticed after one week by the extension of the abscess to the thigh with signs of sepsis. His blood pressure was 90/60 mmHg and his heart rate was 117 beats per minute. His temperature was at 38, 9°C. The deterioration of his condition required a surgery in

emergency with discovering of an extensive necrotizing fasciitis (Fig.3) which required excision of necrotic tissue and the change of antibiotic.

Fig 3 : Extensive necrotizing fasciitis before the second surgery

At the 30th day of hospitalization, the evolution showed an improvement in the wound condition (Fig.4 and Fig.5) and a very good biological assessment (white cells blood at 7280 elements/mm3 the C-reactive protein at 70 mg/l). The patient was treated for another two weeks with oral cefotaxim and rifampicin. The patient is scheduled for a thin skin graft.

Fig 4 : Extensive necrotizing fasciitis during the second surgery

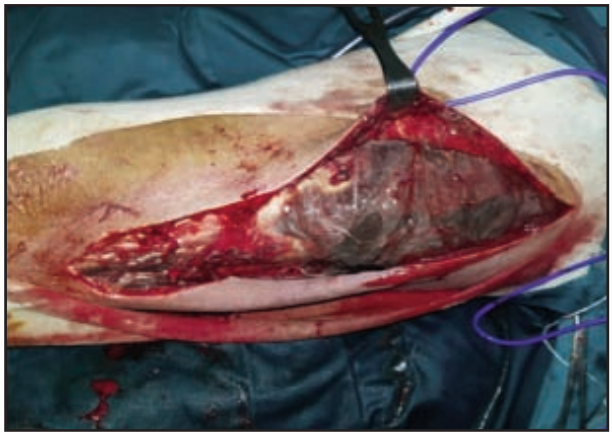
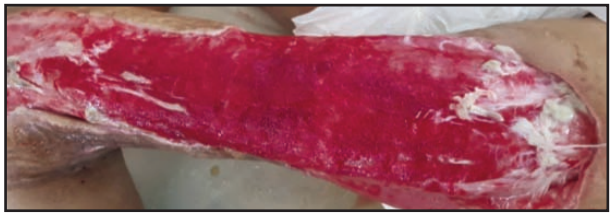


Fig 5 : Improvement in the wound condition



Discussion

Streptococcus canis is mainly found in the commensal flora of animals (16). It is the most common streptococcal species involved in dog's infections (17) and causes respiratory, cutaneous, genital and urinary infections (18). In humans, infection was first reported in 1997 (19) and several cases of bacteremia, skin, and soft tissue infections have since been published (19, 21) mostly in comorbid patients (22). As in our case, local wounds or ulcers and contact with dogs were frequently reported and suspected to be the portal of entry. In one case report [20] and in a recent study (21) *S. canis* isolates recovered from humans and from house pets of the same geographic area were closely related using highly discriminatory typing methods, providing strong evidence for the zoonotic nature of *S. canis* infection (23).

This is the first case of necrotizing fasciitis caused by *S.canis* reported in Tunisia. *S. canis* is not a common cause of infection in humans in Tunisia. Human *S. canis* infections are rarely reported. In a US prospective survey in 2003 and 2004, the proportion of *S. canis* among group G *streptococci* isolated from human invasive infections was only 2.6 % (24).This study confirms that *S. canis* infections are rare and represent only 1% of all streptococcal infections (22). However, *S. canis* infections may have previously been underdiagnosed (22) due to the fact that, group G streptococci are not systematically identified to the species level. Moreover, *S. dysgalactiae* subsp. e*quisimilis* and *S. canis* both form beta-hemolytic large colonies (25) and biochemical identification of *S. canis* is difficult (26). *S. canis* often causes skin or soft tissue infections that sometimes have a severe course (22). Most *S. canis* infections are observed in people who have been bitten by a dog or in dog breeders. Since *S. canis* may be detected in the clinical samples of people who breed animals or who have a history of contact with animals such as dogs, clinical microbiologists should pay close attention to the patient's background *S. canis* can be identified on the basis of its biochemical properties (1). Search for a history of exposure to domestic animals revealed that the patient lived in a unhealthy place with dogs and cats. Considering our patient's history, and data from the literature, we hypothesize that the source of the infection in our patient was a colonization of site of drug injection by dog's salivary fluid. The antibiotic treatment of these infections poses no major problems, even though the emergence of resistance to macrolides, penicillin G and gentamicin should be taken into consideration (28,29).

Conclusion

In conclusion, our case adds to the spectrum of *S. canis* related infections and highlights the ability of this

pathogen to induce necrotizing fasciitis with serious consequences. We believe that group G streptococci responsible for invasive diseases should be identified to species level using mass spectrometry in order to better evaluate and survey the precise incidence of the zoonotic diseases related to *S. canis*. Prospective studies with biomolecular techniques are now required.

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