

## NECROTIZING FASCIITIS IN DOG – CASE STUDY

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### **Abstract**

*Streptococcus spp are common opportunistic pathogens of mammals and are associated with a variety of diseases affecting multiple organ systems. Necrotizing fasciitis is a severe, debilitating disease in adult dogs that can result in systemic illness and death. Toxic shock–like syndrome, a typically fatal sequel of necrotizing fasciitis in dogs. In dogs, *S. canis* is the most common streptococcal species isolated in cases of toxic shock–like syndrome associated with necrotizing fasciitis. This report describes a diagnostic management if necrotizing fasciitis in dog.*

**Key words:** *necrotizing fasciitis, dog, Streptococcus*

### **INTRODUCTION**

Necrotizing fasciitis is a severe, debilitating disease in adult dogs that can result in systemic illness and death (Barkha et al., 2012, Cătană, 2001, Jenkins et al., 2001). Toxic shock–like syndrome, a typically fatal sequel of necrotizing fasciitis in dogs (Barkha et al., 2012). In dogs, *Streptococcus canis* is the most common streptococcal species isolated in cases of toxic shock–like syndrome associated with necrotizing fasciitis (Lam et al., 2010, Lyskova et al., 2007, Miller et al., 1996).

Streptococci are a family of gram-positive bacteria some of which can cause either localized or systemic infections in both humans and animals. Some strains rarely cause disease and are often considered to be commensal (normal) inhabitants of the skin and mucosal surfaces (oral, nasal, intestinal), while other strains are capable of causing serious or even life-threatening infections (Cătană, 2001, Dewinter et al., 1999, Lyskova et al., 2007).

In dogs, Streptococci are known for their ability to occasionally cause septicemia (blood born infections) in puppies and a range of localized diseases in adults (Lyskova et al. 2007).

## **MATERIALS AND METHODS**

One male German Shepard dog (a 12-year-old) was submitted for clinical examination, present bad clinical status, depression, in lateral recumbence, with high fever (40.5° C), 38 bpm respiratory rate, 172 bpm heart rate, short capillary refill time (CRT <1 second), bounding pulses, peripheral vasodilation, intensely painful subcutaneous lesions, and lameness in right side of the neck area. This clinical signs were associated with coughing up blood, bleeding from the nose, severe bruising of the skin, and bloody diarrhea. Aggressive supportive care included intravascular fluid therapy (Isotonic crystalloids 10-15 mL/kg - Lactated Ringer's solution; Colloid 40 mL/kg/day - Hetastrach 6% in 0.9 % NaCl HE span; Dexamethasone sodium phosphate, 4 mg/kg, IV; Vitamin K<sub>1</sub> – 2.5 mg/kg, SC), intravenous antibiotics (Clindamycin, 20 mg/kg/12 hour, IV) and nutritional support (Duphalyte, 30 mL/5kg). After four hours of treatment, rapidly develop severe hypotensive shock and disseminated intravascular coagulation and died. Post-mortem was revealed lesions of septicemia and gangrene. Samples were taken for bacterial culture and hematology (blood, skin and tissue). Hematology focused on the following parameters: complete blood count, prothrombin time, partial thromboplastin time, fibrinogen, d-dimer, clinical chemistry panel and blood gas evaluation. Cultivation and identification of bacterial species was performed by standard methodology. Samples collected were sown to achieve environment cultural examination on calf blood agar 5% and BHI agar. The plates were incubated for 24 hours in normal atmosphere at 37°C. For the rapid identification of the specific antigens of Lancefield group of streptococci was used Pastorex Strep® (Bio-Rad Laboratories). Biochemical characteristics were assessed using API 20 STREP® multi test system (bioMérieux).

## **RESULTS**

Clinical and laboratory findings suggested sepsis (25% band neutrophils and 23500 White blood cell count). Rapid progression of the infection, as well

as anatomopathological findings were characteristic for necrotizing fasciitis of a neck area caused by  $\beta$ -haemolytic *Streptococcus* infection. Cultural examination confirmed the presence of group G  $\beta$ -haemolytic streptococci associated with *Streptococcus canis*.

Typically, infected dogs are found in lateral recumbence, either being too weak to move or experiencing rigidity with mild convulsions. Rapid, uncontrolled fine muscle fasciculation's are often noted. A consistent and important clinical finding is a very high temperature (40.5° C).

Dogs that develop this disease appear to be normal and healthy prior to being recognized as very sick only a short time later. The course of the disease, from initial recognition of illness to death, can be as short as 6 hours. It is not uncommon for the dog to appear normal at bedtime and to be found dead the next morning.

As the disease progresses, a deep, non-productive cough, typical of pulmonary edema, develops. Rapid, spontaneous hemorrhaging, typical of disseminated intravascular coagulation, develops. This can be associated with coughing up blood, bleeding from the nose, severe bruising of the skin, and in some cases bloody diarrhea. Profound hypotension and toxic cardiomyopathy may develop.

## CONCLUSIONS

Streptococcal septicemia in older dogs is often a sequel to localized infections, such as with necrotizing fasciitis. Streptococci are important opportunistic pathogens in the neonatal and adult dog. Streptococcal infection can result in septicemia as well as life-threatening localized infections in the skin and lung. Thus, isolation of *Streptococcus* does not necessarily correlate with disease and must be interpreted with consideration of clinical and pathologic findings.

Clindamycin seems to be particularly useful in acute cases because it halts the metabolism of the streptococci, stopping the cascade of toxins responsible for the high fever, shock and Disseminated Intravascular Coagulation (DIC).

The reason for the emergence/re-emergence of canine necrotizing fasciitis (toxic shock-like syndrome) is unclear and very little is known about transmission, prevention, or immunity following possible exposure.

Unfortunately, to date, advances in detection and prevention have been few. No vaccine has been developed, no medication has been found to be

effective in preventing the infection, and no test has been beneficial at identifying those animals at risk.

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