NOCARDIA & ACTINOMYCES IN THE DOG

By Paul W. Dean, DVM & Roger L. Sifferman, DVM

The thought of "spear grass" has struck the chords of disaster in field dog owners for all memory. The tall, protein-rich grass which heads in summer on the prairie for decades took the brunt of all loss in dogs from the mysterious malady that manifests itself most often in the Fall and Winter in the form of a knot on the side, or in a slowing of performance, a wasting away - and usually death.

Spear grass has a hard needle-sharp head, armed with a barb that keeps it working forward through whatever it enters. Its likelihood of causing its own problem is obvious, and cannot be overlooked. But it is now widely known that the old curse comes in many forms, from many places.

The Grant Avenue Pet Hospital and the new Bradford Park Veterinary hospital in Springfield, MO, have become centers for treatment of "spear grass", "foreign body" and "Nocardia", the infection they carry. Over recent years, Dr. Roger Sifferman and Dr. Paul Dean have seen many cases of the malady.

Their patients have come from training on the Canadian prairie, North Dakota, western Oklahoma, south Texas, from the Deep South - from virtually every area where field dogs are hunted. They have identified the "foreign body" in many forms of seed heads, sticks, pine needles, grass awn. The maligned spear grass is a culprit, but one among many, and the Canadian prairie is but one place among many.

That this insidious problem has taken the lives of dogs - young and old - is widely known. That something can be done about it, especially when detection is early, is not so widely known.

Over the past few seasons, Drs. Sifferman and Dean have completed many extensive surgeries, followed by drug treatments, to some of the finest field trial dogs which have returned to win.

The authors were prevailed upon to prepare this article on the most devastating problems for sporting dogs. Dr. Dean is a board certified surgeon, on the staff of both hospitals.

They have been asked many times if the dog, fully recovered, will be as good as before, and the answer has been, "Yes. But no better."

One of the most devastating diseases the field dog owner can encounter is a diagnosis of infection with either Nocardia or Actinomyces in his animal. Since there is such a high morbidity and mortality rate associated with either of these conditions, early diagnosis and treatment is essential if we are to save many of these patients and return them to a successful career. For that reason, we have prepared this article. Hopefully it will raise awareness and inform owners, handlers, and their veterinarians about these conditions.

Nocardiosis and Actinomycosis are bacterial infections caused by the organisms *Norcardia asteroids* and *Actinomyces bovis*. Both bacteria are found throughout nature, commonly in the soil in the case of Nocardia, and in the oral cavity and bowel.

Frequently, the organisms and infection are associated with contamination of a body cavity by a foreign body such as a grass awn. In field trial and hunting dogs, the foreign body - whether grass awns of foxtails, spear grass, cheat grass, small sticks or pieces of pine needles - gains entrance to the chest cavity through inhalation and carry the bacteria associated with development of Nocardia or Actinomyces infection.

The clinical signs produced by these bacteria are similar, and are usually discussed together. Nocardia and Actinomyces can produce several different syndromes; in our experience, only one syndrome is usually seen in any given animal, rather than a combination of syndromes.

The "systemic" form has been described as

being similar to canine distemper, with signs of fever, loss of appetite, emaciation, coughing, labored breathing, and neurological signs.

The "thoracic" form is that seen most frequently in our practice. Dogs are presented for exercise intolerance, and may have a dry, unproductive cough. Respiratory signs may be gradual in onset, especially in highly trained, athletic dogs. Infection should be suspected if general physical examination, heart-worm check, and cardiac examination fail to document a reason for the dog's symptoms.

Radiography of the chest frequently demonstrate fluid within the chest cavity, and a mass or masses may be noted within the lung fields. Many times, radiographic signs are subtle and recognition of abnormalities requires high quality x-rays. If fluid is noted on x-ray examination, a chest tap may find a characteristic "tomato soup-like" fluid, or a grey-yellow to red-brown fluid which contains small granules or clumps.

A culture should be obtained from the fluid or granules and the laboratory notified that the veterinarian suspects Nocardia or Actinomyces.

The "cutaneous" form is the third. It is characterized by draining tracts and abcess on the skin. Frequently these are found on the limbs, although draining tracts on the chest wall or abdomen have been associated with concurrent infection of either the thorax or abdomen.

Chronic non-healing, draining tracts on the limbs which do not respond to conventional therapy should be suspected of being due to either Nocardia or Antinomyces.

Infection of bone is the fourth form of the disease, and has been reported to be the most common form of infection with Actinomyces. Bone infection commonly involves the spinal vertebrae, frequently being located at the junction of thoracic and lumbar vertebrae and the first three lumbar vertebrae. Many times the bone infection has advanced to the point that neurologic signs predominate and gait abnormalities are seen in the rear limbs.

Treatment of either disease is difficult and prolonged. The organisms are difficult to identify with routine laboratory procedures. A complete discussion of identification techniques is beyond the scope of this article, and other references can be consulted.

A high degree of suspicion, and finding the characteristic fluid in the chest cavity or the presence of sulfur granules, is sufficient to warrant a presumptive diagnosis, and treatment should be instituted immediately.

Treatment can be expected to be successful in approximately 90% of the cutaneous forms, while the thoracic form has a survival rate of 50%. Bone involvement, particularly the spinal vertebrae, signifies a very poor prognosis in our experience.

While details of treatment are not within the intent of this article, antibiotics and surgery are the mainstays of therapy. Surgery is indicated to explore, and excise diseased tissue, and attempt to locate and remove any foreign bodies which may be associated with the lesion. The thoracic form of the disease can require particularly aggressive surgical intervention consisting of removal of as much diseased tissue as possible and the placement of chest drains. Removal of diseased tissue may include one or more of the lung lobes, part of the pericardial sac, and excision of large amounts of the characteristic granular tissue that develops within the chest cavity. Recurrence of infection can occur despite aggressive treatment.

Antibiotic therapy may require several months of treatment with more than one antibiotic administered several times daily in high doses.

It is hoped this article will serve to better inform and increase awareness of these devastating diseases. Early recognition and aggressive treatment are the keys to successful treatment.

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