Compressive Myelopathy in a Free-ranging Red Brocket (Mazama americana) Caused by a Lumbar Paraspinal Abscess with Accompanying Spondylodiscitis

Antonio Carlos Cunha Lacreta Jr., Washington Luiz Assunção Pereira, Mauro Jackson da Silva Moraes, Alex Junior Souza de Souza & Lucien Roberta Valente Miranda de Aguirra

ABSTRACT

Background: Spondylodiscitis is an inflammation that is characterized by the involvement of one and more intervertebral discs and adjacent vertebral bodies. The clinical manifestations of spondylodiscitis are nonspecific and vary with the site and extent of injury, however this kind of lesion is poorly known between free-ranging cervids. In this sense, the presente study aimed to describe the occurrence, clinical, radiographic and anatomopathological findings related to a lumbar abscess accompanied by spondylodiscitis in a free-ranging female red brocket (Mazama americana) from Eastern Brazilian Amazon.

Case: An approximately five-month old, 3,7 kg, female red brocket (Mazama americana), was received at the Veterinary Hospital of the Federal Rural University of Amazônia, in the municipality of Belém, in the State of Pará (Northern Brazil) for clinical care. The animal was rescued from the wild by the Brazilian Institute of Environment and Renewable Natural and presented lethargy, pelvic limb paralysis with proprioceptive deficits. The clinical signs observed suggested a spinal cord injury in the thoracolumbar region and the animal was sent to radiographic examination and myelography performed on the ventrodorsal and lateral projections of the vertebrae and spinal cord. The hemogram revealed anemia (8.74 × 10⁶ cells/mm³) and leukocytosis (29.65 × 10³ cells/mm³) with neutrophilia (95%) and lymphopenia. The simple radiographic examination demonstrated no alteration, but the myelography showed an interruption of the contrast column at the L2 level. Considering the results in the laboratorial exams and advanced clinical state of debility, it was decided to euthanize the animal and subsequent necropsy. Macroscopically, a paravertebral abscess and spondylodiscitis were observed at L2 vertebra position, which resulted in compressive myelopathy. The histopathologic examination revealed an osteomyelitic process, chronic inflammation in the conjunctival fascia in one of the margins of the dura mater, and skeletal muscle abscesses. The presumptive diagnosis of spondylodiscitis was confirmed by the anatomopathological evaluation.

Discussion: Spondylodiscitis and paravertebral abscesses have been widely described in domestic species, such as cattle, dogs, cats, horses, and, especially, pigs, however, reports of these diseases in wild species are still scarce, and the clinical manifestations seem to vary according to the specificity of the lesioned area and the severity of the lesion. The pathogenesis of the process in domestic ruminants may be related to relative blood stasis conditions within the vessels of the vertebral bodies, which are associated with hematogenous spread of pathogens and the occurrence of vertebral osteomyelitis in bovine neonates appears to be associated with deficiencies in passive immunity. Lumbar abscesses may be associated with lung abscesses and/or abscesses at other sites, and umbilical infections are an important route for the spread of hematogenous pathogens that can lead to discospondylitis in ruminants, however in this case, no umbilical lesions and internal organs abscesses that could be the primary source of infection were identified. To date, no previous study have reported this kind of lesion in Mazama americana. Therefore, this disease should be included on the list of differential diagnoses for neurologic changes in wild ruminants.

Keywords: discospondylitis, myelography, paravertebral abscess, red brocket, spinal cord.
INTRODUCTION

The red brocket (Mazama americana) is a deer that belongs to the order Artiodactyla [5]. This species are native to South America and are distributed between Guyana and northern Argentina [6]. According to the International Union for Conservation of Nature (IUCN) Red List of Threatened Species, the red brocket is considered “data deficient” because of the lack of data available for this species [6].

Spondylodiscitis, also called discospondylitis [7] or vertebral osteomyelitis, is an inflammation that is characterized by the involvement of one and more intervertebral discs and adjacent vertebral bodies [2]. Spondylodiscitis has been described in several species, including cattle, horses, goats, cats, dogs, pigs [12], and humans [17]. The clinical manifestations of spondylodiscitis are nonspecific and vary with the site and extent of injury, and spondylodiscitis may promote compression of the spinal cord [1]. In addition, vertebral abscesses are recognized as causes of spinal cord compression injuries in several species, these abscesses are commonly described in ruminants, primarily young cattle and sheep [3,13]. The objective of this study is to report a case of a paralumbar abscess associated with spondylodiscitis causing spinal cord compression in Mazama americana.

CASE

An approximately five-month old, 3.7 kg, female red brocket (Mazama americana), was received at the Veterinary Hospital of the Federal Rural University of Amazônia, in the municipality of Belém, in the State of Pará (Northern Brazil), for clinical care. This animal was rescued from the wild by the Brazilian Institute of Environment and Renewable Natural Resources.

Upon Physical examination, the animal was conscious but lethargic with a rectal temperature of 39.3°C, a dry muffle, and dull sunken eyes (indicating dehydration), atrophy of pelvic muscles and pulmonary crepitation was observed. The animal had decubitus ulcers with secondary pyoderma and a cutaneous nodule in the region of the nasal bone. The animal had pelvic limb paralysis with proprioceptive deficits, lack of superficial and deep sensation, and patellar, cranial tibial and perineal areflexia.

After a physical examination and blood collection for hemogram, the animal was sent for radiographic examination of the spine. Radiographic examination and myelography were performed on the ventrodorsal and lateral projections of the vertebrae and spinal cord. Anesthesia for these procedures was achieved with a continuous infusion of ketamine chloride1 (10 mg/kg IV) and xylazine hydrochloride2 (1 mg/kg IM). After local antisepsis, a hypodermic needle (size 30×7) was introduced via the cerebello-spinal cistern, and 300 mg I/mL of nonionic iodinated contrast media3 was injected into the subarachnoid space at a dose of 0.5 mL/kg.

A provisional diagnosis of lumbar abscess was made. The clinical signs observed suggested a spinal cord injury in the thoracolumbar region. The blood count revealed anemia (8.74 × 10⁶ cells/mm³) and leukocytosis (29.65 × 10³ cells/mm³) with neutrophilia (95%) and lymphopenia (4%).

Upon simple examination, no radiographic changes were observed, however, the myelography showed an interruption of the contrast column at the L2 level (Figure 1). Considering the results in the laboratory exams and advanced clinical state of debility, it was decided to euthanize the animal.

Figure 1. Contrast X-ray (myelography) in the ventrodorsal projection of the thoracolumbar segment of the spinal cord of a red brocket deer. The image shows the interruption of progression of the left and right contrast columns corresponding to the L2-3 vertebral segments.
The necropsy showed a paravertebral abscess and spondylodiscitis localized at L2 (Figure 2), which resulted in compressive myelopathy (Figure 3). Although a subcutaneous nodule on the frontal region was identified as an abscess, the etiologic agent of the lesion could not be isolated or associated with the vertebral lesion. The histopathologic examination revealed an osteomyelitic process, chronic inflammation in the conjunctival fascia in one of the margins of the dura mater, and skeletal muscle abscesses.

**DISCUSSION**

Spondylodiscitis and paravertebral abscesses have been widely described in domestic species, such as cattle, dogs, cats, horses, and, especially, pigs [4,8,12,14,16,19,20]. However, reports of these diseases in wild species are still scarce, and the clinical manifestations seem to vary according to the specificity of the lesioned area and the severity of the lesion.

The simple radiographic examination demonstrated no alterations and this similar result were observed cases of paravertebral abscesses in calves and lambs [13]. The compressive myelopathy was confirmed only by myelography which has been demonstrated in previous reports [20].

The changes in the blood counts (anemia, leukocytosis, neutrophilia) of the present case were similar to results reported in previous studies [11,13], however, in some cases of spondylodiscitis, the blood counts may fall within the normal range [12].

The clinical signs diverged from the clinical signs of thoracolumbar spinal injuries that have previously been described in ruminants (e.g., spastic paraparesis, hyperreflexia, and paraplegia) [13] but the pathologic findings were similar to a case of compressive myelopathy in a 2-month-old heifer [12] and in a case of discospondylosis in a goat [11].

A case of suppurative discospondylitis between T9 and T10 has been described in alpaca [21]. The supplicative discospondylitis was associated with spinal canal compression and advanced clinical paraparesis. This result differs from the clinical findings observed in the present study too. In a specimen of mara (Dolichotis patagonum), paraspinal abscess-associated osteomyelitis of the thoracic vertebrae resulted in posterior limb paralysis [18].

Spondylodiscitis is an important cause of posterior paresis/paralysis in mustelids (Mustela vison) raised in the midwestern United States and beta-hemolytic Streptococcus sp. was identified as the primary cause [15]. The authors made this conclusion after radiographic and pathologic studies of 40 specimens with spondylodiscitis and, additionally, inflammatory lesions and osteolysis of the vertebral bodies in minks have been associated with thoracic vertebrae damage [15].

Lumbar abscesses may be associated with lung abscesses and/or abscesses at other sites [13], and umbilical infections are an important route for the spread of hematogenous pathogens that can lead to discospondylitis in ruminants [9], however in this case no umbilical lesions and internal organs abscesses that could be the primary source of infection were identified.

The etiology of paravertebral abscesses is associated with the anatomic blood flow of the venous system within the vertebral bodies, and
this blood flow is constantly subjected to pressure variations due to deviations in the intra-thoracic and intra-abdominal pressures [8]. Relative blood stasis conditions within these vessels of the vertebral bodies, which are associated with processes of hematogenous spread of pathogens, are crucial for the formation of vertebral abscesses in bovines [8]. The occurrence of vertebral osteomyelitis in bovine neonates appears to be associated with deficiencies in passive immunity [10].

In conclusion, similar to observations in domestic ruminants, discospondylitis and paravertebral abscesses can cause spinal cord compression and the development of clinical neurologic signs in free-ranging cervids. Importantly, while ancillary tests, such as hematology tests and radiographs, produced a presumptive diagnosis, in this case, the definitive diagnosis was made at necropsy.

SOURCES AND MANUFACTURERS
1 Dopalen®, Vetbrands, Jacareí, SP, Brazil.
2 Rompun®, Bayer, São Paulo, SP, Brazil.
3 Ominpaque®, GE Healthcare, Cork, Ireland.

Declaration of interest. The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

18 Rosas-Rosas A.G., Juan-Sallés C. & Garner M.M. 2006. Pathological findings in a captive colony of maras (Dolichotis patagonum). The Veterinary Record. 158: 727-731.

