

Infiltrative Lipoma Causing Lumbar Nerve Root Compression in a Dog

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ABSTRACT

Background: Lipomas are benign soft tissue mesenchymal neoplasms composed of adipose cells and are usually found in the subcutaneous tissue. Occasionally, lipomas may invade muscles or grow between them, in which case they are characterized as infiltrative lipomas. Clinical signs resulting from an intermuscular lipoma compressing peripheral nerves are rarely encountered in dogs. This case report aims to describe the neurological signs, diagnosis, and clinical evaluation of a dog diagnosed with infiltrative lipoma compressing a lumbar spinal nerve root.

Case: A 12-year-old neutered male Fox Paulistinha, weighing 10.5 kg, was presented with difficulties in walking for the past 15 days with no previous history of trauma. On physical examination, the presence of three cutaneous nodules was noted in the ventral thoracic region, with onset of one year and slow and progressive growth. A cytological evaluation of the nodules was performed, and lipoma was diagnosed. At the neurological examination, the patient presented ambulatory paraparesis with marked motor deficit and atrophy of the quadriceps muscles of the left pelvic limb. Conscious proprioceptive deficit, the absence of patellar reflex, and diminished withdrawal reflex were observed in the left hind limb, in addition to diffuse pain on epaxial palpation of the lumbar region. Electroneuromyography showed increased insertion activity in the left gastrocnemius muscle and moderate spontaneous activity (fibrillation). Persistence of 10% was observed in the F-wave study of the left tibial nerve. These findings indicate partial involvement of the roots of the left sciatic-tibial nerve. Magnetic resonance imaging (MRI) showed the presence of a mass measuring $3.18 \times 1.04 \times 1.4$ cm, interspersed with the paravertebral muscles, and located adjacent to the L2 and L3 spinous processes. An ultrasound-guided fine needle aspiration biopsy of the mass was performed and the findings of the cytopathological analysis of the collected material were considered consistent with lipoma. In view of these findings, surgical removal was recommended. However, the owner chose to attempt conservative treatment to control pain. Thus, the patient was treated with gabapentin, tramadol hydrochloride, carprofen, dipyrrone, omeprazole, and physiotherapy. The animal exhibited a good response to conservative treatment, regaining its hind limb mobility in approximately 30 days.

Discussion: Infiltrative lipomas compressing nerve roots are rarely described, with only one report of infiltrative lipoma in the lumbar region causing nerve root compression in dogs found in the literature. MRI was beneficial in this case, since it helped in determine the shape, location, and extent of the mass causing compression of the left L2 nerve root. The history and neurological examination findings in the patient described in this report were accounted for by the presence of an infiltrative lipoma compressing the left nerve root of L2. Surgical excision is the treatment of choice for intramuscular lipomas in most cases since conservative treatment elicits only a limited response. In contradiction to the literature, the dog in this report experienced a good response to conservative treatment, returning to normal mobility approximately 30 days after starting treatment. After six months of follow-up, the dog had not experienced a recurrence of the clinical signs. However, since the tumor has not been removed, clinical relapse is expected to occur in the future. Thus, despite the good response to conservative treatment in this case, we recommend the surgical excision of the tumor in order to decompress the affected nerve root. Although infiltrative lipomas compressing nerve roots are rare, clinicians should consider them as differential diagnosis when there is a presence of subcutaneous lipomas and neurologic signs of radiculopathy.

Keywords: lumbar pain, neoplasia, paraparesis.

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INTRODUCTION

Lipomas are benign soft tissue mesenchymal neoplasms [9,12] composed of adipose cells (5) and are usually found in the subcutaneous tissue [9,11]. Occasionally, lipomas may invade muscles or grow between them, in which case they are considered designated as infiltrative lipomas [1]. In addition to muscle tissue, they can invade connective tissue, bones, and, rarely, peripheral nerves and the spinal cord [4].

While invasive lipomas can elicit clinical manifestations effects through the compression of adjacent tissue [8], clinical signs resulting from an intermuscular lipoma compressing peripheral nerves are rarely encountered in dogs [12]. At present, it is not known why certain lipomas develop a locally invasive behavior and become infiltrative [4].

Lipomas and liposarcomas can be differentiated by means of cytological and histopathological evaluations [5]. Infiltrative lipomas can be identified either by advanced imaging or surgery [2]. The treatment of choice for this type of tumor is complete surgical excision [12].

The case report presented here aims to describe the neurological signs, diagnosis, and clinical evaluation of a dog diagnosed with infiltrative lipoma compressing a lumbar spinal nerve root.

CASE REPORT

A 12-year-old, neutered male Fox Paulistinha, weighing 10.5 kg was presented to the FMVZ-Unesp-Botucatu Veterinary Hospital because of difficulties in walking for the past 15 days with no previous history of trauma, evolving to intermittent decubitus. On physical examination, the dog had a weakened general state with a body condition score level of 2. The presence of three cutaneous nodules was noted in the ventral thoracic region, which the owner claims had appeared about a year ago and displayed slow and progressive growth.

A cytological evaluation of the nodules was performed, and lipoma was diagnosed. On neurological examination, the patient presented ambulatory paraparesis with marked motor deficit and atrophy of the quadriceps muscles of the left pelvic limb. Conscious proprioceptive deficit, the absence of patellar reflex, and diminished withdrawal reflex were observed in the left hind limb, in addition to diffuse pain on epaxial palpation of the lumbar region.

Initially, the patient was referred for radiographic examination of the lumbar region, which revealed no abnormalities. Subsequent electroneuromyography showed increased insertion activity in the left gastrocnemius muscle and moderate spontaneous activity (fibrillation). Persistence of 10% was observed in the F-wave study of the left tibial nerve. These findings indicate partial involvement of the roots of the left sciatic-tibial nerve. Magnetic resonance imaging (MRI) was performed, which showed the presence of a mass measuring $3.18 \times 1.04 \times 1.4$ cm, interspersed with the paravertebral muscles, and located adjacent to the L2 and L3 spinous processes (Figure 1).

An ultrasound-guided fine needle aspiration biopsy of the mass was performed. The cytopathological analysis of the collected material (Figure 2) revealed a small group of adipocytes exhibiting broad, basophilic, and vacuolated cytoplasm with distinct borders and small, rounded, peripherally located, and hyperchromatic nuclei. These findings were considered consistent with lipoma.

In view of these findings, surgical removal was recommended. However, the owner chose to attempt conservative treatment to control pain using gabapentin¹ (10 mg/kg SID for 30 days), tramadol hydrochloride² (4 mg/kg TID for 7 days), carprofen² (2.2 mg/kg BID for 8 days), dipyron³ (25 mg/kg BID for 7 days), omeprazole² (1 mg/kg BID for 20 days), and physiotherapy. The animal exhibited a good response to conservative treatment, regaining its hind limb mobility in approximately 30 days.

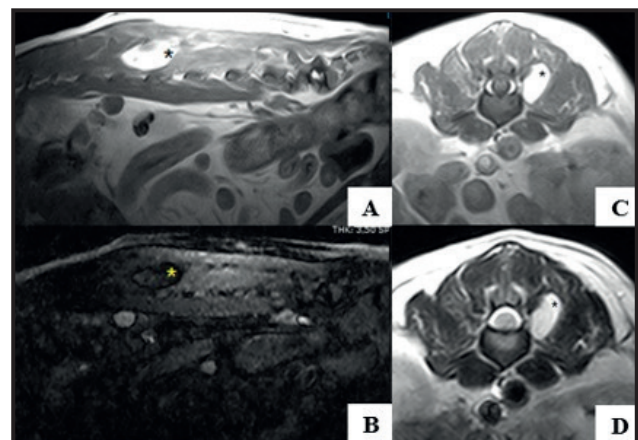


Figure 1. Magnetic resonance imaging of the dog. A- T1 sequence in the sagittal plane demonstrating a hyperintense nodular structure surrounded by paravertebral musculature adjacent to the spinous processes of L2 and L3 (*). B- STIR sequence with suppression signal of the same structure (*) identified in (A). C- & D- T1 and T2 sequence in transverse plane, respectively, showing a circumscribed nodular hyperintense structure (*) with discrete irregular contours, compressing the lumbar nerves roots, located adjacent to the spinous processes of L2 and L3.

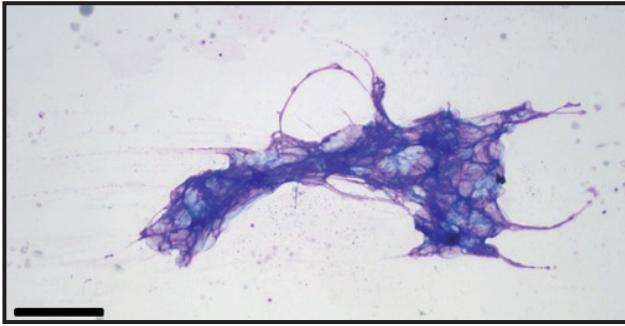


Figure 2. Photomicrography of fine needle aspiration biopsy of the mass showing small group of adipocytes exhibiting broad, basophilic, and vacuolated cytoplasm with distinct borders and small, rounded, peripherally located, and hyperchromatic nuclei. These findings were considered consistent with lipoma [Giemsa; bar= 40 µm].

DISCUSSION

Infiltrative lipomas are uncommon in dogs and rare in cats. Although they may be found in any breed, it most commonly affects Labrador retrievers, Doberman pinschers, and mixed-breed dogs [8]. Females appear to be four times more predisposed to develop lipomas than males [6]. Typical sites for the appearance of infiltrative lipomas include the chest wall and the extremities [1].

Infiltrative lipomas compressing nerve roots are rarely described, with only one report of infiltrative lipoma in the lumbar region causing nerve root compression in dogs found in the literature [1]. In the described case, the dog displayed an absence of patellar reflex, decreased proprioception, motor deficit of the left pelvic limb, atrophy of the quadriceps muscle group, and pain on epaxial palpation of the lumbar region. These manifestations are similar to the signs presented by the animal described in this report.

In humans, intramuscular lipomas are relatively uncommon and account for less than 1% of all types of lipomas [3,10]. While they can affect any age group, most occur in patients between 40 and 70 years of age. In humans, as well as in dogs, lipomas can appear anywhere, although there seems to be a predisposition towards the large muscle groups of the limbs and the trunk [7,9].

Although the diagnosis of infiltrative lipoma could only have been confirmed by cytological examination, MRI was beneficial in this case for since it helped in determine the shape, location, and extent of the mass causing compression of the left L2 nerve root. Imaging as well as also for provided providing evidence that the mass was of adipose origin.

The history and neurological examination findings in the patient described in this report were accounted for by the presence of an infiltrative lipoma compressing the left nerve root of L2.

Surgical excision is the treatment of choice for intramuscular lipomas in most cases since conservative treatment elicits only a limited response [9]. In contradiction to the literature, the dog in this report experienced a good response to conservative treatment, returning to normal mobility approximately 30 days after starting treatment. After six months of follow-up, the dog had not experienced a recurrence of the clinical signs. However, since the tumor has not been removed, clinical relapse is expected to occur in the future.

Despite the good response to conservative treatment in this case (with functional recovery of the pelvic limb movements and improvement of the general condition of the patient), we recommend the surgical excision of the tumor in order to decompress the affected nerve root.

Although infiltrative lipomas compressing nerve roots are rare, clinicians should consider them as differential diagnosis when there is a presence of subcutaneous lipomas and neurologic signs of radiculopathy.

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