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Short Communication

Femoral mononeuropathy caused by a malignant sarcoma: Two case reports

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Abstract

A 9-year old miniature poodle and a 6-year old American Staffordshire terrier were evaluated for slowly progressive lameness and atrophy of the left pelvic limb. Neurological examinations of both animals were consistent with femoral nerve lesions. In both cases, neoplastic masses were identified within the left psoas muscle, invading the left femoral nerve or, in one case, its nerve roots. Ultrasound-guided fine needle aspirate and histopathological examination of the masses revealed that these were malignant sarcomas. Femoral mononeuropathies are very rare in dogs, and most descriptions of femoral nerve lesions are caused by traumatic injuries. Descriptions of neoplastic processes affecting the femoral nerve are limited to peripheral nerve sheath tumours (PNST). These cases provide the first descriptions of malignant neoplasms other than PNSTs that infiltrate the femoral nerve or its nerve roots and cause unilateral femoral mononeuropathy and lameness of obscure origin.

Keywords: Dog; Sarcoma; Femoral nerve; Mononeuropathy; Monoparesis

Pelvic limb monoparesis caused by unilateral femoral neuropathy is a rare clinical entity in dogs, but it can be seen occasionally after traumatic injuries causing hip extension and iliopsoas muscle tears (Rossmeisl et al., 2004). We describe here the clinical features, magnetic resonance imaging (MRI) and pathological findings in two dogs with femoral mononeuropathies caused by malignant sarcomas.

Case 1

A 9-year old, male miniature poodle was presented with a 6 month history of left pelvic limb (LPL), non weight-bearing lameness and progressive muscle atrophy. On examination, the dog showed LPL generalised muscle atrophy, which was more severe in the quadriceps muscle, LPL lameness and pain upon caudal extension of the left coxofemoral joint. Neurologically, LPL monoparesis and conscious propioceptive deficits in both pelvic limbs (PL) were observed. Absent patellar reflex and decreased hip flexion upon withdrawal of the limb were also noticed. A lesion affecting the left femoral nerve was suspected.

Initial diagnostic evaluation included a complete blood cell count (CBC), serum biochemical profile, urinalysis and thoracic radiographs, which gave unremarkable results. On abdominal radiographs, a 2×2 cm calcified area was seen in the left caudal retroperitoneal space. Abdominal ultrasound revealed the presence of a hypoechoic, oval and well defined (2.5×1.5 cm) mass located on the left side and cranial to the urinary bladder. Cytological examination of an ultrasound-guided, fine needle aspirate

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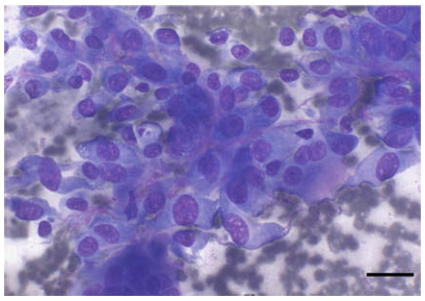

Fig. 1. Case 1. Fine needle aspirate cytological preparation of the retroperitoneal mass. Presence of fusiform cells and multinucleated giant cells. Bar = 25 μm.

of the mass was consistent with a sarcoma (Fig. 1). On exploratory laparotomy, a 7×3 cm mass was observed in the retroperitoneal space. The mass was attached to the left psoas muscle and infiltrated the left lumbosacral plexus. Partial debulking of the mass was performed.

Histopathological examination revealed a malignant mesenchymal cell population within a matrix of osteoid tissue, which was mineralised in some areas and infiltrated the adjacent tissues. Immunohistochemically, the neoplastic cells were strongly positive to Vimentin and S-100 protein, and a few were also positive to protein gene product 9.5 (PGP 9.5). Nerve fibres entrapped in the tumour stained strongly with PGP 9.5, but only slightly with S-100 protein. A diagnosis of extra-skeletal ossifying osteosarcoma was made. Adjuvant chemotherapy with doxorubicin (Farmiblastina, Kenfarma) (1 mg/kg IV q 21 days) was initiated, but the animal was euthanased 3 months later due to worsening of clinical signs.

Case 2

A 6-year old, female American Staffordshire terrier was referred for a 2 year history of LPL lameness. The animal had decreased motor function and demonstrated inability to bear weight on the LPL. On physical examination, the left quadriceps muscle was severely atrophied. Postural reaction deficits were detected in the LPL, as well as absence of patellar reflex and decreased hip flexion. The withdrawal reflex was mildly weak in the contralateral PL. Hyperaesthesia was observed upon paraspinal palpation of the caudal lumbar area, more severe on the left side. Based on these findings, a lesion involving the L4–L7 spinal cord segments, with more severe involvement of the left L4–L6 spinal segments, nerve roots or the left femoral nerve was suspected.

Initial diagnostic evaluation (CBC, complete biochemical profile, urinalysis, thoracic radiographs and abdominal ultrasound) did not show any abnormalities. An MRI study of the lumbar spine was performed (Toshiba MR System MRT-150 A 1.5 Tesla). MR images revealed the presence of a $4 \times 2 \times 2.5$ cm. paravertebral mass, located ventrally to the transverse processes of L5, L6 and L7, within the psoas muscle. The mass extended dorsally and entered through the intervertebral foramen into the spinal canal, following the course of the 5th lumbar spinal nerve root. The MR signal was heterogeneously hyperintense on T2W images and isointense/mildly hypointense on T1W images compared to muscle. Mild non-homogeneous peripheral contrast enhancement was observed following IV gadolinium (Dotarem Ácido Gadotérico, Guerbet) administration. Atrophy of the left paravertebral lumbar muscles was also observed (Fig. 2).

Exploratory surgery for biopsy and mass excision was undertaken. The left L5 spinal nerve root was thickened and infiltrated by a firm, whitish mass, which displaced the cauda equina to the right (Fig. 3). Dissection following the left L5 spinal nerve ventrally led to the mass, which was located within the psoas muscle. The mass was carefully dissected from the surrounding tissues and excised. The L5 spinal nerve and root were also excised proximal to the site of the enlargement. Microscopic examination of the mass revealed a neoplastic mesenchymal cell proliferation with an infiltrative growing pattern that affected the adjacent skeletal muscle, peripheral nerve, spinal roots and ganglia. Some nerve fascicles within the mass showed loss of nerve fibres and Wallerian degeneration. The immunohistochemical staining pattern was similar to that described for the first dog. A diagnosis of undifferentiated sarcoma affecting the left psoas muscle and infiltrating the 5th spinal nerve and root was made.

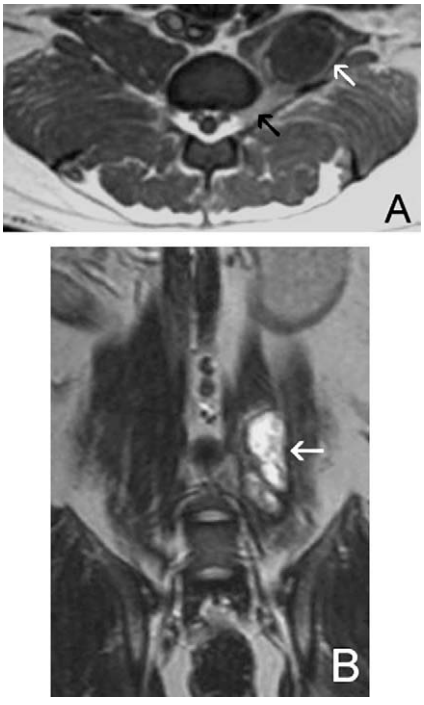

Fig. 2. Case 2. (A) Transverse, post-contrast T1-weighted MR scan of the lumbar area. Tumor extension into the psoas muscle (white arrow), and L5–L6 left foraminal infiltration (black arrow). (B) Dorsal, Fast SE, T2-weighted MR scan of the same area. Well-delineated mass within the psoas muscle (white arrow).