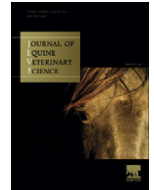




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Case Report

Pathological Findings in a Case of Equine T-Cell Lymphoma Associated with Ataxia

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ABSTRACT

A 15-year-old Dutch Warmblood gelding suddenly developed incoordination and hindlimb stumbling. The horse had a history of eyelid lymphoma. Necropsy revealed yellow-white or dark reddish-brown masses adhering to the outer surface of the spinal dura mater from the first cervical vertebra to the seventh thoracic vertebra. The spinal cord close to the first cervical vertebra and the seventh thoracic vertebra was markedly compressed by the masses filling the epidural space. The masses were also observed in the larynx, eyelids, and adipose-rich tissues, including the joints and orbits. They appeared similar in shape. The mandibular, retropharyngeal, axillary, superficial inguinal, deep inguinal, and lateral iliac lymph nodes were solid and enlarged. Histologically, the masses were composed of small or medium-sized lymphocyte-like tumor cells, but atypical cells and mitotic figures were rare. There were moderate infiltrations of macrophages and multinucleated giant cells, which were occasionally ingesting the surrounding tumor cells. Immunohistochemically, the tumor cells were classified as T-cell-derived cells. Throughout the spinal cord, enlargement or loss of nerve axons, dilation of periaxonal spaces, and macrophage infiltration into periaxonal spaces were observed, mainly in the ventral funiculus. Spinal cord compression by the tumor mass was suggested as a cause of the locomotive dysfunction. This is the first report of equine lymphoma with ataxia located from the proximal cervical to middle thoracic dura mater and in joint cavities.

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1. Introduction

The spinal cord is well protected from external injurious forces by the bony encasements. However, penetrating

foreign bodies, such as wandering parasites, can cause direct injuries to the spinal cord [1]. Indirect injuries occur (eg, vertebral luxations or fractures with dislocation) much more commonly. In horses, the most common indirect injuries to the spinal cord are produced by compression of the cervical cord in cervical vertebral stenotic myelopathy (Wobbler syndrome) [1]. Compression of the spinal cord causes damage to nerve fibers mainly due to the stress to which the cord is subjected and partly due to impediment to the blood supply, resulting in locomotive disorders [1]. Hematomas associated with vertebral fracture and neoplasm also cause motor problems by compressing the spinal cord, and the clinical signs deteriorate with time [2]. Melanoma [3–5], lymphoma [6–8], angiosarcoma [9], and

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Fig. 1. Masses in the right upper eyelid.

undifferentiated sarcomas [10] can form in the dura mater of the spinal cord in horses. In cats and cattle, lymphoma in the central nervous system is seen with varying frequency. In horses, however, lymphoma in central nervous system is uncommon [2]. This report describes a multicentric lymphoma observed in the epidural space and organs containing abundant adipose tissue in a horse with ataxia.

2. Case Report

A 15-year-old Dutch Warmblood gelding with no history of neurological or locomotor disease underwent surgery to remove masses in the right upper eyelid (Fig. 1). The removed tissue was diagnosed histopathologically as lymphoma. The lymphoma recurred in the left lower and right lower and third eyelids, and a second surgery was performed 48 days after the first removal. The horse was comfortable thereafter and returned to its previous discipline, but subcutaneous masses were palpable on the left auricle and the right nasal vestibule, and edema of the lower limbs and the preputium was apparent 3 months after the first surgery. One hundred thirteen days later after the first surgery, the horse developed sudden incoordination and hindlimb stumbling, and these signs progressed rapidly over 5 days. Because of the poor prognosis, the horse was humanely destroyed and subjected to necropsy.

At necropsy, in the section from the first cervical vertebra to the seventh thoracic vertebra, yellow-white or dark reddish-brown masses were found adhering to the

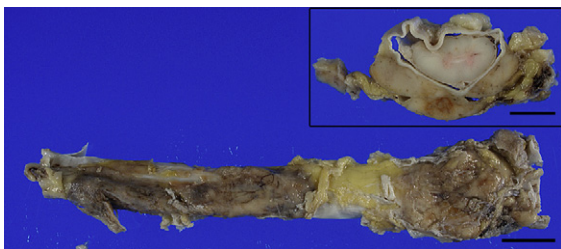


Fig. 2. Yellow-white or dark reddish-brown masses adhering to the outer surface of the spinal dura mater from C1 to C4, dorsal view. Bar = 2 cm. Inset: cross-section of C1. Bar = 1 cm.



Fig. 3. Articular surface of the elbow joint. Masses (arrow) adhered to the synovial surface near the attachment of the articular capsule and in the inner articular fossa.

outer surface of the spinal dura mater (Fig. 2). In the epidural space, the adipose tissue had decreased in volume and had been replaced by the masses. The masses were mainly seen in the ventral spinal cord and were a maximum of 15 mm thick. Near the first cervical and seventh thoracic vertebrae, the spinal cord had changed markedly in shape as a result of compression by the masses filling the epidural space. These masses were not bound to the inner surface of the spinal canal. At the shoulder, elbow, hip, and knee joints, many brown or yellow-brown masses (maximum $2.0 \times 1.0 \times 1.0 \text{ cm}^3$) adhered to the synovial surface close to the articular capsule attachments and the inner articular fossae adjacent to the articular surfaces (eg, trochanteric fossa, coronoid fossa) (Fig. 3). In the lower left eyelid, a subcutaneous mass ($4.0 \times 1.0 \times 1.0 \text{ cm}^3$) was observed along the ventral margin of the orbit. Similar masses were found in the right upper, lower, and third eyelids and the periorbital fat body. All the masses that appeared in the joints and around the eyes were red to light reddish-brown and solid.

In the larynx, flattened, tan, solid masses approximately 2 cm in diameter were observed cranial to the right vestibule and caudal to the rear of the intermembranous part of the vocal fold. These masses continued under the vocal fold. Small solid masses ($<1 \text{ cm}$ in diameter) were scattered under the skin of both thoracolumbar parts of body; in cross-section, the masses were solid and tan. There were similar masses in the subcutaneous tissues of the nasal vestibule and pinnae. The mandibular, retropharyngeal, axillary, superficial inguinal, deep inguinal, and lateral iliac lymph nodes were markedly enlarged (maximum $10.0 \times 5.0 \times 2.0 \text{ cm}^3$); they were solid and dark reddish-brown or yellow-white.

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