Intramuscular Mass in a Horse with Disseminated Metastases

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Signalment & History

- 24-year-old, female Bay Thoroughbred horse with chronic history of weight loss and limping on right hindlimb

- Progressed to dragging of both hindlimbs and ataxia

- Could not get up and down, rDVM administered NSAID’s

- Condition declined, euthanized
Left hindlimb
Left sublumbar area
Morphological Diagnosis

Most consistent with
Rhabdomyosarcoma of the left hindlimb with disseminated metastasis.
However!

We have just received the additional IHC results from Dr. Caserto (Cornell)
Leiomyosarcoma of the left hindlimb with disseminated metastasis

Cell origin: probably smooth muscle of blood vessels

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Equine Leiomyosarcoma

- Rare in horses
- In *Tumors in Domestic Animals* - Dogs are most common
- Locations reported in horses: Testicle, urogenital tract, bone (maxilla and mandible)
- Immunohistochemistry: SMA positive
- No reports of equine leiomyosarcoma which metastasized to the central nervous system

<table>
<thead>
<tr>
<th>Site</th>
<th>Dog</th>
<th>Dog, % by Site</th>
<th>Cat</th>
<th>Horse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esophagus</td>
<td>1</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stomach</td>
<td>11</td>
<td>7</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Small intestine</td>
<td>46</td>
<td>29</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Ileocecal</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Large intestine (including rectum and anus)</td>
<td>15</td>
<td>10</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Cecum</td>
<td>24</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Spleen</td>
<td>21</td>
<td>13</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Liver</td>
<td>1</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>15</td>
<td>10</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Ureter</td>
<td>1</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Vulva/vagina</td>
<td>13</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Uterus</td>
<td>1</td>
<td>0.5</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Perineal/pelvic canal</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>158</td>
<td><strong>100.0</strong></td>
<td><strong>22</strong></td>
<td><strong>2</strong></td>
</tr>
</tbody>
</table>

*In: Tumors in Domestic Animals*

No IHC for c-kit. Possibly GIST

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Human Leiomyosarcoma

Three types according to their site of origin:

• **Leiomyosarcomas of soft tissues**: most common

• **Cutaneous leiomyosarcoma**: best prognosis

• **Vascular leiomyosarcomas**:
  1. **Rare**, accounting for only 5.8% of all patients with leiomyosarcoma (Abed et al. 2009)
  2. Often arise from **large vessels** (Farshid et al. 2002), most commonly inferior vena cava, saphenous vein, femoral vein, pulmonary artery, femoral artery
  3. **High risk of metastases and poor prognosis** (Abed et al. 2009)
Eosinophilic Infiltrate in Neoplasms

A paraneoplastic phenomenon in different malignancies

Lymphomas, leukemias, lung, thyroid, cervical, uterine, breast, pancreas, gastrointestinal, and hepatocellular cancers

In humans

Hypereosinophilia associated with cardiac rhabdomyosarcoma \(^ {\text{Am J Hematol. 2003 ;74:64-7}}\)

Hypothesis

• A necrotic tumor can produce **cytokines** that stimulate eosinophil production.

• Tumors can produce or expose new antigens that trigger **T cells** to elicit eosinophil differentiation or chemotactic factors.

• Metastases can trigger **mast cells** to release cytokines that promote the proliferation of eosinophils.

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Summary

- More than 70% replacement of the skeletal muscle of the left thigh by the neoplasm. The primary site of the neoplasm was likely the left hindlimb.

- The origin of this leiomyosarcoma would be smooth muscle of blood vessels.

- This leiomyosarcoma metastasized to multiple organs.

- The metastasis to the brain and spinal cord are unusual.

- The unique histological feature was the presence of abundant hyalinized eosinophilic stroma.

- The cells with cross-striations are likely pre-existing skeletal muscle.

- The stroma contained moderate infiltration of eosinophils.

To our knowledge,

This is the first case of leiomyosarcoma in horses with disseminated metastasis.
Thank you!