

**ACVR CT/MRI society – Case of the Month  
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This month's case was provided by:

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- **Signalment:**
  - 8-year-old MN Basset Hound
  
- **History:**
  - 1-week history progressive tetraparesis
  - Paresis worse in the front limbs than the hind limbs
  - Cervical pain
  - Unremarkable orthogonal cervical radiographs
  
- **Study performed:**
  - Cervical spinal MRI (pre and post contrast). 1T MRI
  - Pre-contrast: Sagittal T2, Coronal STIR, Axial T2, Sagittal T2FFE, Axial T2 FLAIR, Axial T1
  - Post-contrast: Axial T1, Sagittal T1, Coronal T1, Venogram

- **Findings:**
  - There is extradural material within the right and left ventrolateral aspects of the spinal canal, paralleling the expected position of the ventral vertebral venous sinuses, most severe at the level of mid-C3. This material is T2/FLAIR hyperintense with signal intensity on the T1 sequence, and displays variable contrast enhancement.
  - Some of the aberrant material is hypointense on gradient sequences and extends into the left C3-4 intervertebral foramen.
  - The floor of the vertebral canal is disrupted where these tissues are most expanded, especially on the left. The bone is otherwise normal in signal intensity and shape.
  - There is moderate spinal cord compression associated with the aberrant material, most severe at the level of cranial C3.
  - There is reduced venous flow in the left ventral vertebral venous sinus at this level on the venogram sequence.

- **Conclusions:**
  - The primary differential we gave for these findings was a vascular anomaly or neoplasm with secondary resorptive necrosis of the adjacent bone.
  
- **Outcome/Follow up:**
  - The patient's respiratory status acutely deteriorated and the owners elected for humane euthanasia.
  - Gross post mortem revealed, on the floor of the third cervical vertebra, a 2.5cmx1cm protrusion of dark red tissue with associated spinal cord compression, adjacent to the aberrant tissue was a 0.5cmx0.5cm region of lysis within the bone.
  - Histopathology of the aberrant tissue revealed a primary hemangiosarcoma with associated bony remodeling of the C3 vertebral body, and C3-4 spinal cord compression with acute axonal degeneration were observed.
  
- **Comments:**
  - The aberrant material was relatively symmetric, and confluent with the ventral vertebral venous sinuses. Primary vascular disease was therefore considered, such as a hematoma or arteriovenous malformation<sup>(1,2)</sup>. However, the contrast enhancement made hematoma less likely. Heterogeneous contrast enhancement of the vertebral sinuses has been previously reported with thrombi which then cause secondary sinus enlargement, thus this was also considered as a differential<sup>(3)</sup>.
  - The venogram sequence was obtained to more accurately assess venous flow. Reduced flow was noted in the left ventral vertebral sinus. Given the final diagnosis, this reduction in flow is likely secondary to the compressive/infiltrative effects of the hemangiosarcoma.
  - Hemangiosarcoma has been previously reported as a cause for spinal cord compression. Previous reports describe lesions both primarily affecting bone, and also lesions completely sparing the surrounding bone<sup>(4,5)</sup>. In this case, the bone was slightly disrupted. Based on the fact that the bone maintained normal signal intensity, and the disruption was relatively minor, it was thought most likely secondary pressure necrosis. Histopathology agreed with this finding.
  - Unlike the submitted case, previously reported vertebral hemangiosarcomas displayed strong homogeneous contrast enhancement<sup>(4,5)</sup>. The exact origin in each case is not known, and may differ (osseous vs vascular vs nervous etc). Furthermore, MRI contrast enhancement of hemangiosarcomas in other areas of the body (spleen/liver) can display heterogeneous enhancement<sup>(6)</sup>.

- **Supplementary post mortem images:**

The spinal canal from above with the dorsal laminae removed, the mass is on the right side of the canal



The spinal cord with focal atrophy



The vertebral body showing osteolysis



- **References:**

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- (6) Craig A. Clifford, E. Scott Pretorius, Chick Weisse, Karin U. Sorenmo, Kenneth J. Drobatz, Evan S. Siegelman, and Jeffrey A. Magnetic Resonance Imaging of Focal Splenic and Hepatic Lesions in the Dog. *Solomon J Vet Intern Med* 2004;18:330–338