Slosh simulation in a computer model of canine syringomyelia

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OBJECTIVES

The exact pathogenesis of syringomyelia is unknown. Epidural venous distention during Valsalva manoeuvres (raised intrathoracic pressure when expiring against a closed glottis e.g. coughing) causing impulsive movement of fluid ("slosh") within the syrinx is a proposed cause of syrinx dissection into spinal cord parenchyma and craniocaudal propagation of the cavity. We sought to test the "slosh" hypothesis by epidural excitation of CSF pulse in a computer model of canine syringomyelia.

METHODS

Our previously developed canine syringomyelia computer model was modified to include an epidural pressure

pulse. Simulations were run for: a cord with small syringes at C2 and the cervicothoracic junction (locations previously shown prone to syrinx formation); a healthy cord; and cord with a large syrinx.

RESULTS

If small syringes are present, there are peaks of stress at those locations. For a single cervical syrinx, stress is highest at the caudal end of the syrinx, whereas for a cervicothoracic syrinx stress is highest at the cranial end of the syrinx. When there are both small cervical and cervicothoracic syringes, the stress peaks remain similar to each separately. However, there are no pressure peaks with a large syrinx. The stress is slightly elevated in the caudal cord up to the caudal end of the syrinx.

STATEMENT (CONCLUSIONS)

The findings supported the "slosh" hypothesis suggesting that small cervical syringes might propagate caudally and thoracic syringes cranially. However, when the syrinx is large there is less focal stress which may explain why a syrinx can expand rapidly but then remain unchanged in shape over years.

Thoracolumbar intervertebral foraminal and far lateral disc extrusions in dogs: clinical signs, MRI findings and short-term outcome

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OBJECTIVES

The aim of this study was to describe the clinical signs and MRI findings, as well as to assess short-term outcome after medical or surgical treatment in dogs diagnosed with thoracolumbar intervertebral foraminal and far lateral disc extrusions.

METHODS

The medical records of five referral institutions were retrospectively searched between 2009 and 2019 for dogs diagnosed with thoracolumbar (T3-L6) intervertebral foraminal and/or far lateral disc extrusions. Twenty-one dogs were identified and included.

RESULTS

Cocker Spaniels and Dachshunds were the most commonly affected breeds. Median age at presentation was 5 years, weight 12Kg and time from onset to presentation was 17.5 days. Most frequent clinical findings were pain on spinal palpation and/or hip extension (86%) and pelvic limb lameness (71%). Caudal lumbar intervertebral disc extrusions (L5-L6 or L6-L7) were present in 86% of the cases. All cases in which contrast was administered had nerve root or perilesional contrast enhancement on MRI. Surgical decompression was performed in 66% of the cases and 33% were treated with strict rest and a combination of gabapentin and NSAIDs or steroids. Improvement was observed in all surgically treated cases and the three medically treated in which follow-up was available. Median time of follow-up was 28 days.

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On: Wed, 26 Apr 2023 14:07:25