What Is Your Diagnosis?

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Figure 1—Lateral (A) and ventrodorsal (B) radiographic views of the head and neck of an 8-year-old spayed female Japanese Chin evaluated for acute onset of general proprioceptive ataxia and paresis in the pelvic limbs and exacerbation of chronic signs of neck pain.

History

An 8-year-old spayed female Japanese Chin was referred for evaluation of an acute onset of ataxia and exacerbation of chronic signs of neck pain. The dog had a history of intermittent neck-guarding episodes since acquisition at 2 years of age. Abnormalities on physical examination included advanced periodontal disease, pigmentary keratitis, and corneal scarring of the left eye. The neck was held in ventroflexion. The dog was reluctant to move the neck in dorsal and lateral directions. Observation of the gait revealed mild general proprioceptive ataxia most notable in the right pelvic limb. Postural reactions were delayed in the right thoracic and both pelvic limbs. Spinal reflexes were normal to slightly exaggerated in all limbs. Cranial nerve examination was normal. Severe cervical paraspinal hyperesthesia was evident on palpation.

Results of CBC, serum biochemical analysis, and urinalysis were within reference limits. No abnormalities were found on radiographic images of the thorax. Abdominal radiography revealed mineralized structures within the urinary bladder and both kidneys. Abdominal ultrasonography confirmed renal and cystic calculi. The dog was anesthetized, and lateral and ventrodorsal radiographic images of the head and neck were made (**Figure 1**).

Determine whether additional imaging studies are required, or make your diagnosis from Figure 1—then turn the page →

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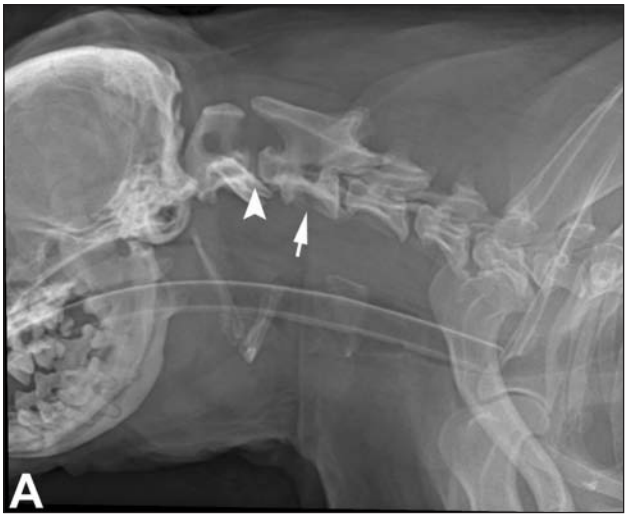

Figure 2—Same radiographic views as Figure 1. Notice that there is no evidence of a dens (arrowhead) and that the vertebral bodies of C2 and C3 are fused (arrow).

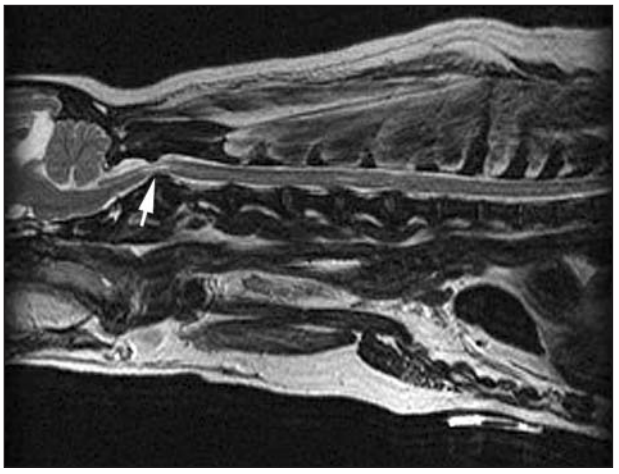

Figure 3—Parasagittal T2-weighted magnetic resonance image of the head and neck of the dog in Figure 1 obtained after IV administration of contrast medium[a] (0.22 mL/kg [0.1 mL/lb]). A herniated degenerative disk is present in the intervertebral disk space of C1-2. The dens is absent, and there is a focal region of increased signal intensity in the spinal cord at this region (arrow).

Figure 4—Axial T2-weighted magnetic resonance image of the head and neck of the dog in Figure 1. There is a focal region of increased signal intensity and compression in the spinal cord at this region (arrow).

Diagnostic Imaging Findings and Interpretation

Only 6 distinct cervical vertebrae are evident. The vertebral bodies of C2 and C3 are fused, and the dens is absent. The dorsal spinous process of the axis appears flattened. Radiolucencies are evident within the axis, likely secondary to the misshapen conformation. The lateral vertebral foramen of the atlas is more prominent than normal, and the body of the atlas is shortened. The occipitoatlantoaxial region is irregularly formed, and the occipital condyles are not delineated (**Figure 2**).

Magnetic resonance imaging was performed to help identify the source and location of spinal cord compression (**Figures 3 and 4**). A herniated disk at the intervertebral disk space of C1-2, causing an extradural compression of the spinal cord, was confirmed by magnetic resonance imaging. Multiple protruding degenerative disks were evident along the entire cervical portion of the vertebral column. A focal area of hyperintensity was evident in the T2-weighted images of the spinal cord at the intervertebral disk space at C1-2 and C4-5, suggestive of either syringohydromyelia or edema secondary to trauma.

Computed tomography of the spinal cord in the cervical region was performed to further evaluate the osseous structures of the neck. Computed tomography revealed hypoplastic occipital condyles. The vertebral foramen and transverse foramina of C1 were enlarged. The spinous process of C2 was widened and split dorsally, and the dens was confirmed as absent. Degenerative disks were evident at the intervertebral disk spaces of C1-2, C2-3, C3-4, and C4-5. The hyoid apparatus was also malformed as the ceratohyoid bones were not present. Collectively, imaging findings were consistent with occipitoatlantoaxial malformation and spinal cord compression at the level of C1-C2 secondary to intervertebral disk degeneration and herniation.

Comments

Given the guarded prognosis and uncertainty of success with surgical management, the owner elected for conservative management with strict cage rest and corticosteroid administration. On follow-up at 1 month after discharge, the dog had resolution of ataxia and signs of neck pain.

Occipitoatlantoaxial malformation has been recognized as an uncommon cause of atlantoaxial instability and paresis in dogs. Atlantoaxial instability may result from ligamentous malformations and agenesis of the dens. To our knowledge, this is the first report of a herniated disk at the intervertebral disk space at C1-2 in a dog and demonstrates the importance of diagnostic imaging in the diagnosis of a C1-2 disk herniation and occipitoatlantoaxial malformation.

a. Omniscan, 287 mg/mL solution IV, GE Healthcare Inc, Princeton, NJ.