

## WHAT IS YOUR DIAGNOSIS

Pranee Tuntivanich Suwicha Chuthatep

### *Signalment*

A 9-year-old male Pomeranian

### *History*

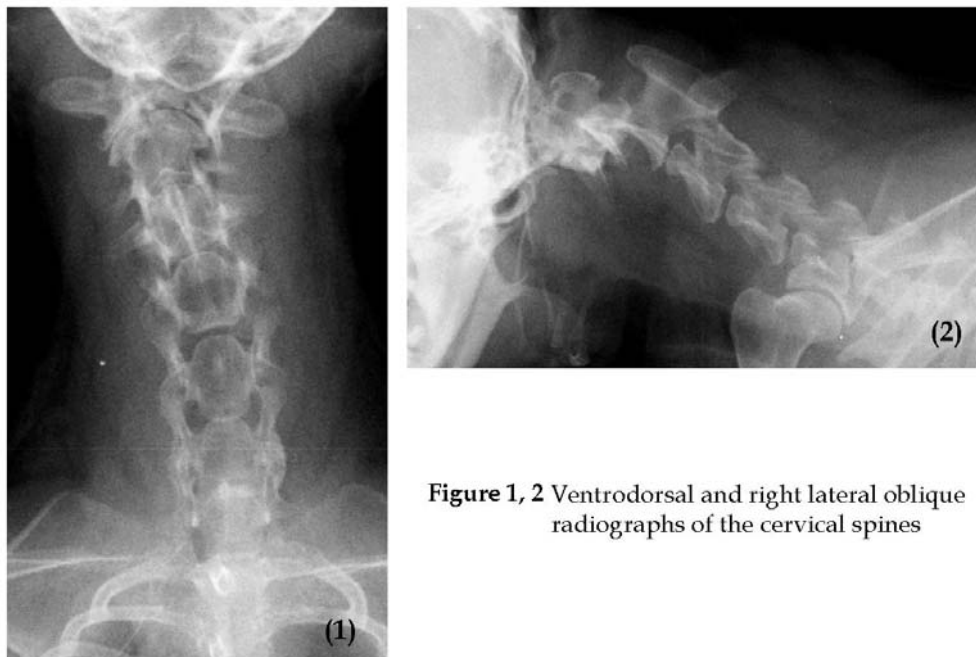
The dog had had tetra paresis after fell down from step 4 weeks ago. He had good appetite without constipation or stranguria.

### *Clinical Examination*

The dog had pain during flexion and extension of the neck. Both pain and proprioceptive reflexes from all limbs were normal via neurological examination. Mild leukopenia was detected from blood examination.

### *Radiographic Examination*

Plain ventrodorsal and right lateral oblique with flexed head radiographs of the cervical spines were taken to evaluate cervical vertebrae and intervertebral disc space abnormalities.



**Figure 1, 2** Ventrodorsal and right lateral oblique radiographs of the cervical spines

Give your diagnosis and turn to the next page.

### **Radiographic findings**

The ventrodorsal radiograph (Fig 1) revealed a strength angulation between articular surface of C1 (Atlas) and C2 (Axis). Lengths of the cervical vertebral bodies were normal without any transverse process fracture. In the right lateral oblique radiograph (Fig 2), an increase of the space between lamina of C1 and C2 was clearly seen. Dorsal displacement of the C2 vertebral body and dislocation of the articular surface of C1-2 were detected due to the fracture of the most cranial portion of the C2 articulation (dens fracture).

### **Radiographic diagnosis**

Fracture of the dens of C2 with C1-2 dislocation

### **Discussion**

Cervical vertebral fractures involving the C1-2 spinal part are about 80% of cervical traumatic cases. This cranial portion is susceptible to serious injury because of the relatively higher articular rigidity compared to the caudal portion of the cervical vertebrae. These anatomical and functional differences lead to increased cranial stress, and then result in injury when the neck is suddenly and forcefully hyperextended. Anyway, fracture with or without dislocation of the C1-2 are better tolerated than that of the other. This is due to the comparatively large diameter of the spinal canal compared to the spinal cord, which gives greater opportunity for the cord to survive under compressive effects of extradural hemorrhage and edema. It is the reason why partially displaced proximal cervical fractures show only neck pain or limb paresis.

In order to diagnose cord compression caused by spinal fracture, several special imaging techniques can be considered. Myelography is a conventional technique. However, it is potentially dangerous due to an intrathecal contrast injection; such as iodine contrast that can lead to direct neurotoxic effects and secondary swelling and malacia. Magnetic Resonance Imaging (MRI) can afford clarification of spinal cord damage and intervertebral disk rupture/displacement. In case of minimally displaced fractures, Computed Tomography (CT) is well suited to evaluating a small separated fragment and small fracture gap.



**Figure 3** Right lateral oblique projection with mild head flexion can afford identification of the dens fracture (white arrow) because this part is usually obscured by the transverse processes of C1 in plain lateral radiograph.

### **Reference**

Farrow, C.S. 2003. Spinal injury. In: Veterinary Diagnostic Imaging: The Dog and Cat. C.S. Farrow(ed). St. Louis, Missouri: Mosby. 275-284.