

## What Is Your Diagnosis?

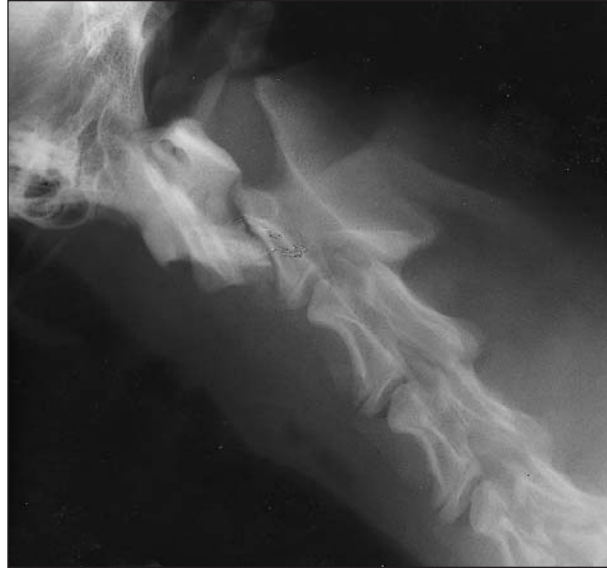


Figure 1—Lateral radiographic view of the cervical region of the vertebral column of a 6-month-old dog that was hit by a car.

### History

A 6-month-old mixed-breed dog was evaluated because of persistent signs of neck pain after being hit by a car the preceding day. Physical examination revealed signs of intense pain during deep palpation and manipulation of the cervical region of the vertebral column. Neurologic examination did not reveal upper or lower motor neuron deficits in any of the limbs. The dog was fully ambulatory, and other injuries secondary to the trauma were not detected. Because the dog had signs of neck pain, cervical radiographs were obtained (Fig 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 view as in Figure 1. The odontoid process is fractured away from the axis (black arrow), but remains attached to the body of the atlas (white arrow). Notice the step malalignment of the vertebral canal between the atlas and the axis (arrowhead).

### Diagnosis

**Radiographic diagnosis**—Oblique fracture of the odontoid process from the axial body (Fig 2).

### Comments

The axis was displaced craniodorsally, creating a severe step malalignment of the vertebral canal (Fig 2). Surgical stabilization of the displaced atlantoaxial joint was recommended, but conservative treatment consisting of strict confinement and placement of an external cervical brace was instituted, because the dog did not have neurologic deficits and the owners were concerned about costs. Myelography was not done, because the location of the lesion was obvious, and the dog did not have neurologic abnormalities.

The dog was evaluated again 5 days later because of mild ataxia, tetraparesis, and conscious proprioceptive deficits related to overactivity and loosening of the cervical brace. The fit of the brace was corrected, and strict confinement was enforced. Decreasing dosages of dexamethasone (initially 0.25 mg/kg [0.125 mg/lb] of body weight, IV) were administered and resulted in an improvement in the dog's ability to ambulate over the next 3 days. The brace was removed approximately 3 weeks later when the dog was examined and found to have no neurologic abnormalities or signs of cervical pain.

Ten weeks after the initial injury, the dog was evaluated again after being hit by a car. Clinical signs referable to the initial cervical fracture were not detected. Cervical radiographs were obtained (Fig 3), and evidence of bony remodeling and sclerosis at the initial fracture site were seen, with a suggestion of ventral bony bridging between the odontoid process and the body of the atlas. The severity of malalignment appeared decreased, compared with the initial malalignment.

The cervical region of the vertebral column is considered to be the least common site for vertebral fractures or subluxations.<sup>1</sup> Most dogs with cervical injury have signs of neck pain with mild to no neurologic deficits.<sup>2,3</sup> The large ratio of vertebral canal diameter to spinal cord diameter in the cranial cervical region



Figure 3—Lateral radiographic view of the cervical region of the dog described in Figure 1, obtained 10 weeks later. Notice the decreased step malalignment of the vertebral canal between the atlas and the axis (arrowhead) and the ventral bony bridging between the odontoid process and the body of the atlas.

accounts for the lack or late onset of abnormal neurologic signs when this area is injured.<sup>3,4</sup>

Surgical decompression and stabilization is the current treatment of choice for dogs with cervical fractures or subluxations and severe neurologic deficits, deteriorating neurologic status, obvious radiographic or clinical evidence of joint instability, or persistent signs of pain.<sup>3,5</sup> Dogs that have mild or no neurologic deficits can be managed conservatively with a neck brace and strict confinement. Results of a recent retrospective study indicate that 14% of dogs with cervical fractures have signs of neck pain as the only clinical sign.<sup>6</sup> This finding reinforces the need for obtaining radiographs even when neurologic deficits are not detected.

Plain radiographs often reveal fractures of the vertebral body, laminae, or articular processes or physis, vertebral malalignment, narrow intervertebral disk spaces, and narrowing of the spinal canal.<sup>7</sup> Although myelography could provide more information regarding spinal cord compression and swelling, anesthesia and cisternal puncture could increase the risk for further spinal cord damage because of anatomic distortion and spinal instability in the traumatized patient.<sup>3</sup>

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