Wobbler Syndrome
(Cervical Vertebral Instability)

Wobbler syndrome (cervical (neck) vertebral instability) is caused by compression of the cervical spinal cord as a result of cervical vertebral malformation-malarticulation or instability. Spinal cord compression injures the portion of the spinal cord necessary for an animal to stand and move normally.

In Doberman Pinscher and Great Dane dogs, the skeletal abnormality occurs predominantly in the last three cervical vertebrae (the fifth, sixth and seventh cervical vertebrae). The cause of the skeletal malformation or malarticulation is unknown. Clinical studies suggest both genetics and nutrition may play a role in the development of the defects. Research has shown that, in some young dogs, excessive intake of a diet high in protein, energy, calcium, and phosphorus accelerates growth. This may induce skeletal changes such as those seen in some of these "wobbler" dogs.

The most common cervical vertebral abnormality is a narrowed spinal canal through which the spinal cord must pass. The canal is reduced in height and mildly compresses the spinal cord, especially during extension of the neck. Other abnormalities in the cervical vertebrae include overgrowth of the body of the vertebrae into the spinal canal, abnormal shape of the vertebral body or the joints between the vertebrae, or excessive mobility of the cervical vertebrae. These abnormalities eventually place so much stress on the intervertebral discs that they degenerate, rupture, and then generate additional pressure on the already compressed spinal cord. The result is an acute problem secondary to chronic abnormalities in the last three cervical vertebrae (Fig. 1).

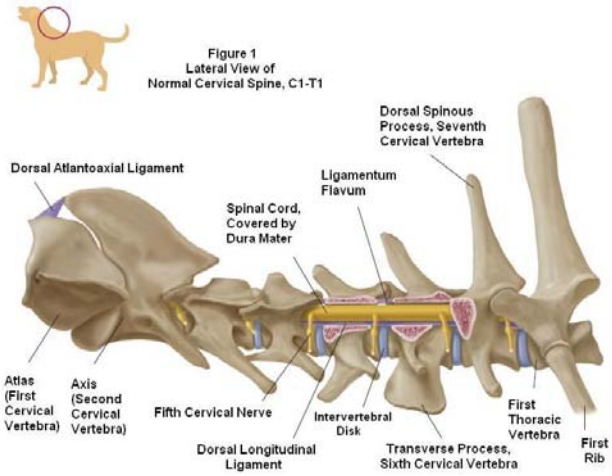


Figure 1
Lateral View of Normal Cervical Spine, C1-T1

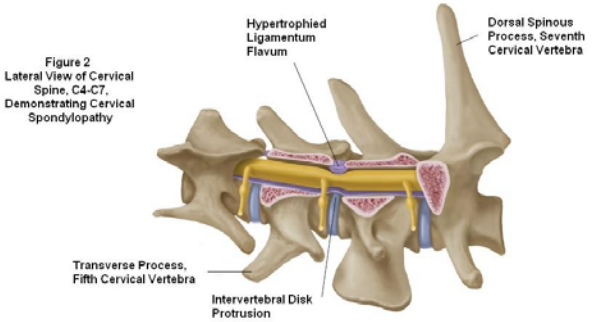


Figure 2
Lateral View of Cervical Spine, C4-C7, Demonstrating Cervical Spondylopathy

There is no evidence published to date that the disease can be predicted by radiographic (x-ray) study of clinically normal dogs. Severe vertebral malformation might indicate that a dog would be likely to experience spinal cord compression. However, dogs with minimal radiographic changes may remain free of clinical signs of spinal cord compression.

Wobbler syndrome is more commonly seen in younger Great Danes and older Doberman Pinschers but may be seen in other breeds as well. Radiographs should be taken in the normal position and with the neck extended and flexed. A MRI or myelogram (contrast dye study of the spine) is necessary because the extent of spinal

cord compression cannot be determined with survey radiographs (Fig. 3).

Figure 3
Lateral projection of a cervical myelogram demonstrating compression of the dorsal and ventral aspects of the spinal cord between the sixth and seventh cervical vertebrae (C6-7)

Symptoms

Initial signs of weakness and incoordination occur rapidly and are most apparent in the hind limbs. The clinical signs worsen slowly over succeeding weeks. The hind limbs often are spread wider apart than normal, causing the hindquarters to sway from side to side. The hind limbs may not fully extend, causing a crouched posture with the toes scuffing on the ground with each step. The degree of forelimb involvement varies from no observable abnormality to an obvious stiffness and awkward use of the forelimbs. In mild cases, or early in the disease, these signs may be most obvious as the dog turns corners, and may be less apparent when the dog walks or runs along a straight path. An abrupt change in speed or direction may exacerbate the neurological signs.

Because the nervous system involvement is limited to a small section of the cervical spinal cord, these dogs remain alert and responsive. Dogs usually do not exhibit pain on manipulation of the neck.

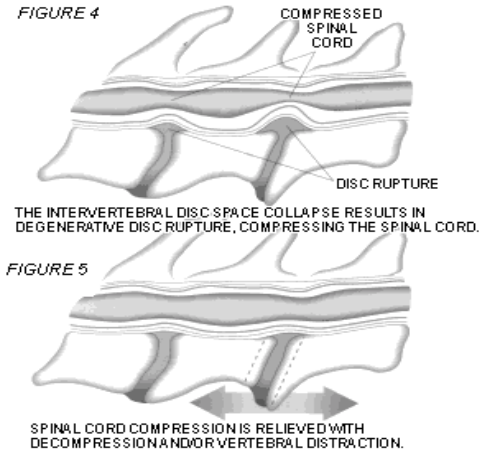
The reason some dogs do not show clinical signs until they are older is likely due to mild initial vertebral abnormalities. With time, however, continued movement of abnormal vertebral articulations causes secondary changes in the intervertebral discs which result in disc degeneration and rupture. When observing dogs move as part of the neurological examination, it must be determined if any gait abnormality is because the dog cannot function normally or because the dog does not want to function normally. The latter occurs from pain associated with skeletal disease in the limbs, including hip dysplasia, osteochondrosis dissecans of the cervical vertebrae in young, giant breed dogs, and hypertrophic osteodystrophy. In dogs with these skeletal diseases, the stride is usually shorter than normal, often creating a choppy gait. However, these patients always know the position of their limbs, which are kept directly under the body. Joint pain may be determined by palpation.

Diagnosis

Diagnosis of wobbler syndrome requires a more extensive evaluation than plain survey radiographs (x-rays) can provide. A MRI or myelogram is used to confirm not only the location of a compression but also the amount of spinal cord swelling. Myelograms are common and safe diagnostic procedures when performed with care and under the proper conditions. Laboratory tests on blood and cerebrospinal fluid usually are within normal limits. Both a MRI or a myelogram will require a general gas anesthesia.

Treatment

With the first clinical episode, treatment is directed primarily at the spinal cord injury and consists of corticosteroid administration to reduce edema (swelling) that may be present in the compressed segment of the spinal cord. However, medical therapy usually provides only temporary improvement at best. Surgery provides spinal cord decompression and an opportunity to directly repair many vertebral abnormalities. Although many techniques are described, the most common surgical procedure is to remove any ruptured disc material and then stabilize the vertebrae (Fig. 4).



It may be necessary to distract the vertebrae prior to stabilization and fusion to overcome the collapse of the intervertebral space. The "dynamic" intervertebral collapse and distraction demonstrated in Figure 5 could result in nerve root entrapment and pain if not corrected.

Prognosis

Prognosis depends on the severity of clinical signs and the degree of skeletal disease present. If the dog was paralyzed and unable to stand before surgery, the prognosis for recovery after surgery will be guarded. The dog that was able to ambulate freely (but with incoordination) before surgery will have a better prognosis. Although it is anticipated that surgery will stop progression of clinical signs and result in improved function, it is the degree of permanent spinal cord damage that determines the final outcome.

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