

What is atlanto-axial instability?

Atlanto-axial instability is a congenital condition caused by abnormal articulation between the first cervical vertebrae (aka: the atlas) and the second cervical vertebrae (aka: the axis). The most common cause of the instability is malformation of a portion of the axis called the dens, which sits in a groove at the base of the axis. There are several ligaments that hold the atlas and axis together, all of which can be malformed or torn in dogs with atlanto-axial instability. When the atlas and axis are not secured together properly, the axis can tilt forward and press on the spinal cord in the neck, causing neurologic damage.

The disease is most common in small and toy-breed dogs, such as Chihuahuas and Yorkshire Terriers; however, it has been reported in larger breed dogs.

What are the signs seen in dogs with atlanto-axial instability?

Clinical signs are typically seen in young dogs and may occur after play with inadvertent trauma to the neck. The most common sign is pain in the neck and reluctance to turn the head. Other signs include collapsing episodes, decreased ability to walk in all four limbs, and, in severe cases, inability to stand. With severe pressure on the spinal cord, animals can also have difficulty breathing.

What is the treatment for atlanto-axial instability?

There are two broad categories of treatment: medical and surgical. Medical treatment involves placing the dog in a splint/cast that covers from just behind the eyes to the middle of the back for several weeks to months. This keeps the dog from being able to move the neck. Over time, some dogs develop scar tissue around the atlanto-axial joint, which stabilizes it. Some dogs do not need surgery after the cast is removed. Other dogs have recurrence of their neurologic signs after the cast is removed and require surgery. Medical management is often preferred in puppies because they are still growing and have very small, soft bones.

Surgical management is often recommended for full-grown dogs (older than 8-12 months) or in dogs with severe enough signs that they are at risk of permanent damage if surgical stabilization is not done (i.e. severe pain, difficulty walking, collapsing episodes). Surgery involves placing pins through the bottom of the atlas and axis to reconnect them.

What is the prognosis for medical and surgical management?

Medical management may be successful in puppies that have had neurologic signs for a short period of time (fewer than 30 days). Some dogs fail medical management and get worse, while others improve initially but have recurrence of signs, especially with any future trauma to the spinal cord in the neck. Complications associated with the splint/cast include difficulty eating/drinking, skin infection and ulcers, ear infection, and corneal ulcers.

Atlanto-Axial Instability



Surgical treatment is successful in most dogs. Young adult dogs (younger than 2 years) with clinical signs present for a short period of time (fewer than 10 months) have a better overall outcome than older dogs that have had chronic spinal cord compression and potentially permanent spinal cord damage. Dogs with less severe neurologic signs (i.e. pain only) have a better immediate post-operative outcome than dogs with severe neurologic signs (i.e. inability to walk or move the limbs). Complications that can occur in surgery include inability to place the pins due to small, malformed bones; fracture of the bones; trauma to the spinal cord; or bleeding. Some dogs will have difficulty swallowing initially after surgery, which usually improves in one to two weeks. Rarely, dogs may have weakness of the laryngeal muscles if there was any nerve damage during surgery. Long-term complications may include infection of the pins, migration of the pins, or fracture of the pins/bones.