

## **Atlanto-axial instability**

### **What is atlanto-axial instability?**

The atlanto-axial (AA) joint is the joint between the first (atlas) and second (axis) vertebrae (bones) in the neck. It is different from other joints in the vertebral column (spine) as there is no intervertebral disc present. Instead the AA joint is stabilised by ligaments – this allows the head to move from side to side.

This condition is typically the result of a congenial malformation of bones or ligament at the AA joint and that leads to this joint being unstable. This instability may lead to excessive movement (subluxation) resulting in a trauma and compression of the spinal cord.

We typically see AA instability in miniature and toy breeds, often less than 2 years of age. However any breed can be affected. It is also possible to develop AA instability following trauma to the neck.

### **What signs are associated with AA instability?**

Onset of signs can be acute (sudden) or chronic (long) and intermittent depending on the specific abnormality. Clinical signs can vary from neck pain only, to dogs with tetraplegia (no movement in all four limbs) with respiratory difficulty.

### **How do we diagnose AA instability?**

Diagnosis of AA is usually based on a combination of signalment (age, breed), history, corresponding neurological examination that identifies neck pain with or without neurological deficits, and diagnostic imaging.

X-rays of the neck can be useful for diagnosing AA subluxation however they only provide limited information about the abnormalities and will not provide information about the spinal cord. Therefore, in many cases further imaging such as MRI or CT (or both) may be required. An MRI scan will give information about spinal cord injury whilst the CT scan enables better visualisation of the bones and is needed for planning surgery.

### **What is the treatment for AA?**

There are two main treatment options for AA instability: medical management or surgery. Medical management involves strict cage rest and pain-relief. Sometimes we will discuss using a short-term bandage or splint. This may be beneficial in dogs with mild clinical signs however surgery is indicated in most patients.

The aim of surgery is to stabilise the AA joint in a normal position. This would hopefully alleviate any neck pain, stop the spinal cord from sustaining any further injury and allow the spinal cord to recover from injury. Commonly the surgery performed involves placing bone screws into the first and second cervical vertebral and connecting the screws together with a specialist bone cement. This surgery is complex due to both the location of the problem and the size of the patients and therefore should only be performed by a surgeon with advanced training. The prognosis tends to be better in dogs that show clinical signs when young and are walking at the time of surgery.