Angular Limb Deformity

What is an angular limb deformity (ALD)?

An angular limb deformity is an abnormality in the spatial alignment of the long bones of the limbs. Angular limb deformities can cause shortening of the limb, abnormal stress and strain on adjacent joints and can lead to degenerative joint disease over time. Angular limb deformities result in functional or mechanical lameness as a result of abnormal alignment, and lameness as a result of pain due to abnormal stresses on joints.

What are the causes of angular limb deformity?

The most common cause of angular limb deformity is premature arrest of long-bone growth plates, causing asynchronous growth of a pair of bones (such as the radius and ulna), whereby one bone stops growing prematurely and acts as a bowstring, causing the paired bone (which is still growing) to bend and twist.

This condition is most common in patients with short legs and abnormal conformation. At some stage, these deformities become excessive and produce functional lameness and pain. Other dogs develop ALD because they have sustained traumatic injuries at a young age. If these injuries affect one of a pair of actively growing bones, premature cessation of growth can occur, resulting in ALD. Angular limb deformity can also result from healing of a long-bone fracture in an abnormal position.

Are there certain breeds at risk?

Some canine breeds e.g. Bulldogs, Shih Tzu and Lhaso Apso have a tendency towards this problem as part of their intended conformation, and have been selectively bred with the intention of producing pronounced angular limb deformities.

How do I know if my dog has an ALD?

If you own a dog from a breed that is expected to have short, bowed limbs, recognizing that there is a real problem can be difficult. Regular consultations with your veterinary surgeon during puppyhood can help with early recognition of any problems. For these breeds, limping on one or both fore limbs is the most common sign of a problem. Deformities can also affect the hind limbs, but this is less common, with the exception of Dachshunds who have a tendency towards pathological deformities in the fore and hind limbs. If you have a young puppy who is not from a breed where a bowlegged posture is expected, any signs of a visible limb deformity should be considered significant, and consultation with a specialist orthopaedic surgeon should be sought as early as possible.
How is ALD diagnosed?

ALD is one of the most complex orthopaedic problems affecting dogs. ALD is typically diagnosed following a multimodal evaluation process. During your initial appointment at North Coast Veterinary Specialist and Referral Centre your dog will be examined by one of our orthopaedic specialists to determine the extent of the deformity and the amount of discomfort it causes your dog.

Following this your dog will most likely be admitted to the hospital to enable us to perform radiographs of the affected limb / limbs and contralateral limb for comparison under sedation or general anaesthesia. Your dog may also require computed tomography (CT) which is an advanced diagnostic imaging technique performed by our surgical team. The CT images provide the opportunity for the orthopaedic surgeon to map and build a 3D image of your dogs’ limb allowing them to plan the most appropriate surgical correction plan. Your dog will receive one-on-one nursing care throughout the process by one of our nurses from the surgical nursing team who are all highly trained and experienced in anaesthesia and sedation. Following diagnostic imaging your dog will have surgery scheduled in the near future, to enable us to adequately plan the surgical technique for your pet, which will be different in every case.

What is the best treatment for ALD?

The main goals of surgery are to alleviate any pain your pet may be feeling, to correct the angular malalignment, to prevent further deformities, and to treat any limb shortening. This is achieved by a procedure called an osteotomy; where the abnormal shaped bone is cut at predetermined sites to enable us to straighten the bone and realign the joints. The bones are then fixed in their new position using either internal fixation (plates and screws) or external fixation with a sophisticated framework on the outside of your dogs leg.

If your pet is suffering from shortening of the limb, spatial realignment will be performed using an external frame that allows us to make daily adjustments and encourage lengthening of the limb for several weeks following surgery.

What happens to my dog after surgery?

After surgical repair, post-operative radiographs will be obtained to confirm correct implant placement and alignment of the joint. Your pets limbs will then be bandaged.

Immediately after surgery your pet will be recovered from anaesthetic peacefully, under the watchful eye of our trained nurses. Post-operative analgesia and intensive care will be provided in our designated recovery ward where your patient will be monitored and nursed by a dedicated team of nurses and vets.

The following day your pet will usually be ready to be discharged. Over the following weeks you will have to return to the clinic weekly for bandage changes, an assessment of the alignment of your pets limb, frame adjustments, and to enable us to ensure your pet is not developing an infection. This is a time consuming process, but is essential for your pets recovery and to ensure complications do not occur.
At around 6 weeks after the initial surgery, we will perform radiographs of your pet’s limbs to ensure the bones are healing correctly, and to enable us to determine when we can remove the frame from the outside of your pet’s legs.

During this recovery process, physiotherapy plays an important role in ensuring optimal return to function for your pet. Our in-house physiotherapy service will treat your pet as an out-patient, and will cater a home physiotherapy programme for you to perform.

Strict exercise restriction is necessary for up to 8 weeks after surgery to ensure that there is no excessive strain on the implants or your pet’s legs, and to enable optimal healing.

What complications can occur?
As with any surgery, there are potential complications. These include delayed bone healing, implant failure, malalignment and infection.

What is the prognosis after surgical treatment?
At North Coast Veterinary Specialist and Referral Centre, we have had excellent success in correcting limb deformities.