

BASIC INFORMATION

Description

Angular limb deformities (ALDs) are a general class of bone growth disturbances that develop when the physis (growth plate) of a growing bone is damaged. The bones of the legs grow from physes at the ends of each bone. If a physis ceases to grow because of disease or trauma, the leg will be shortened (if the entire physis is damaged) or improperly angled (if a portion of the physis is damaged).

Causes

The cause of most ALDs is trauma. Sometimes even mild injuries can result in an ALD. In the dog, the most common ALD occurs when the ulna (the smaller bone of the foreleg) ceases to grow, forcing the radius (the larger bone of the foreleg) to deviate because the two are bound together by ligaments. Fractures, other bone diseases (such as hypertrophic osteodystrophy or retained cartilaginous cores), and breed-related conditions (such as pes varus in dachshunds) can cause ALDs.

Clinical Signs

Usually, a limb that was previously normal becomes bent or grows at an odd angle. Some breeds, especially the chondrodystrophic breeds (dachshunds, Pekingese, bulldogs, basset hounds, and so on), have shortened, misshapen legs as part of their normal conformation, but ALD goes beyond what is considered normal. The opposite limb usually has a normal appearance for the breed.

Diagnostic Tests

An ALD may be suspected based on the clinical appearance of the leg. An orthopedic examination and x-rays are usually necessary to fully evaluate the extent of an ALD.

TREATMENT AND FOLLOW-UP

Treatment Options

If the ALD occurs in the foreleg (ulna and radius) and is detected early, before significant angling occurs, surgical removal of a small portion of the ulna is often curative. For more advanced deformities and deformities in other bones, various surgical techniques can be used to correct the malalignment. Such techniques can include removal of portions or wedges of bones, followed by insertion of a bone plate and screws into the bone, or use of external fixation devices. Other complicating factors, such as malalignment of the nearby joints, must be addressed as well.

Follow-up Care

Dogs that are still growing and sustain even mild trauma to the foreleg should be closely monitored for 4-6 weeks for the earliest signs of ALD. It is best to correct the condition early in the course, before it worsens. Postoperative care depends on the type of surgical procedure used but can involve bandage and splint changes, care of external pins, and restricted exercise until the surgery sites heal. Follow-up x-rays are performed periodically to monitor healing.

Prognosis

If the ALD in the foreleg is addressed early in its course, the prognosis is very good. For more advanced foreleg ALD, the prognosis varies from guarded (uncertain) to good. Concurrent malalignment and arthritis of the adjacent elbow and wrist (carpus) worsen the prognosis. ALD that affects other bones generally carries a favorable prognosis if the ALD can be corrected prior to the development of arthritis in the adjacent joints.