

Growth Plate Issues in Dogs

Story at-a-glance

- An angular limb deformity is a bone growth abnormality that causes a limb to grow curved or bowed rather than straight.
- These deformities occur in young, still-growing dogs, usually after trauma to a growth plate in the leg. However, angular limb deformities can also be the result of premature closing of growth plates, an outcome that is inherited in certain breeds.
- When cells in a growth plate are damaged, they stop growing. Meanwhile, healthy cells in the leg continue to grow. Typically, one bone of the forearm (where injuries often occur) stops growing, while the second bone continues to develop. The non-growing bone applies tension to the healthy bone, causing it to begin to curve, bow or rotate.
- Early diagnosis and treatment of a growth plate injury is crucial for a good treatment outcome. Puppy parents should be on alert for injuries, and if trauma is suspected, you should continuously monitor the growth and straightness of one limb against the opposing limb for early detection of a developing angular limb deformity.
- Treatment of angular limb deformities often requires surgery – and sometimes multiple surgeries. The goal should always be to prevent injury in the first place. Prevention can also include appropriate joint support supplementation as well as regular chiropractic adjustments.

By Dr. Becker

Angular Limb Deformities: What They Are and How They Happen

An angular limb deformity is a bone growth problem that causes the limb to develop in a curved or crooked direction rather than straight.^{1,2}

These limb deformities occur in young, developing animals as a result of some sort of trauma to the growth plate in the leg.

Often the trauma is caused by a puppy being hit by a car, stepped on, dropped, or injured in some other way.

However, sometimes an angular limb deformity is the result of premature closing of the growth plates.

Certain breeds, for example the basset hound, Shih tzu and dachshund, are genetically predisposed to premature growth plate closure.

Many of these dogs have short, slightly crooked legs.

And while this leg development is technically normal for some of these breeds, the problem is sometimes so pronounced it can cause lameness.

Why Growing Puppies Are So Vulnerable

Most of your dog's growth occurs between four and eight months of age.

The bones grow and lengthen -- a process made possible by the growth plates at the end of long limb bones.

When a puppy reaches about one year old, the growth plates seal closed. After natural closure of these plates, an injury to the leg won't result in the overwhelming damage or deformity seen in younger dogs.

However, if an immature growth plate – which is often softer than other parts of the bone – becomes injured, the damaged cells stop growing. Meanwhile, the uninjured cells continue to grow.

Since growth plate injuries typically occur on one side of the plate or the other, the damaged side of the bone quits growing, but the healthy side continues to grow. This is how the bone ends up anything but straight.

How a Curved or Bowed Limb Develops

The most common angular limb deformity occurs in a puppy's forearm, which has a two-bone system comprised of the ulna and the radius.³

If the growth plate of either of these bones is injured (usually it's the ulna), the damaged bone will stop growing, but the other bone in the two-bone system will continue to grow.

The damaged, no-longer-growing bone acts like a rubber band, putting tension on the growing bone. This causes the healthy bone to bow, curve or rotate as it continues to develop. In some worst-case scenarios, the bone can develop all three deformities – it can bow, curve AND rotate.

Younger dogs whose bones are still growing – especially large and giant breed puppies – are at much greater risk for developing a severe deformity than older animals after a traumatic injury.

If the problem isn't diagnosed quickly and corrected with surgery, there can be much bigger problems in the future for the injured puppy.

Abnormal limb deformities result in abnormal joint movement, which can be quite painful for the dog.

[Arthritis](#) is another common outcome, along with the inability to move normally.

If the deformity is severe and is left untreated, a dog can actually lose all function in the affected limb.

Diagnosing Growth Plate Damage

If you have a young, growing puppy and you know she's been injured, it's important to get her seen by your veterinarian right away.

Early diagnosis of traumatic bone injuries is essential if your pup is to have a good treatment outcome.

Crushing injuries that damage the cells of the growth plate aren't picked up on x-rays. In addition, it can take a few weeks after your puppy is injured for an angular limb deformity to start to become obvious.

So it's extremely important to know if your pet has sustained an injury, and you also need to continuously compare the length and straightness of a potentially damaged leg to the length and straightness of the uninjured leg.

If you detect any developing differences between the two legs, you should seek immediate veterinary care.

Treatment Options

In some cases, surgery is necessary to make every effort to straighten the damaged bone. In severe cases, often multiple surgeries will be required.

The type of surgery will depend on the injury, which bone is damaged, your dog's age, and how much growing she still has left to do.

There are two primary types of procedures performed to correct angular limb deformities.

For young dogs with forelimb damage and plenty of growing left to do, often the ulna (which is usually the injured bone) will be cut and detached from the radius. This allows the radius to straighten and the limb to grow normally.

In older dogs that are at or very close to their full adult size, the corrective surgery often performed is called an osteotomy.⁴ An osteotomy involves cutting both the ulna and radius at the point of the greatest curvature. The radius is then straightened, which allows for proper alignment of the elbow and wrist joints.

This procedure requires about four to six weeks for healing, and during this period it's really important your dog remains strictly confined to limit mobility. This will insure efficient healing and the best outcome post-surgery.

Some dogs will require a second surgery called a limb lengthening procedure in addition to the surgery to straighten the leg.

Prevention

Needless to say, the goal of any pet owner should be to avoid trauma to a growing puppy altogether.

This is why veterinarians warn new puppy parents not to engage their pets in rigorous jumping or other very strenuous exercises until all the growth plates have had time to close and seal.

Many proactive veterinarians, including me, encourage pet owners to provide high-risk breed puppies with joint support (glycosaminoglycans) or chondroprotective agents (for example, chondroitin) to help reduce damage to growth plates.

I also highly recommend having your growing puppy regularly adjusted by a licensed animal chiropractor⁵ to keep the limbs and joints properly aligned. This can serve as a sort of insurance plan in case trauma to a growth plate does occur. Stress from injury is minimized when the body is in [proper alignment](#).