

Other GSD Bone disorders

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Panosteitis

Panoestitis affects any of the long bones (most commonly of the forequarter) with a shifting lameness pattern; one or more legs may be affected at any one time. This is a growth associated problem where both hormonal and vascular problems have been postulated as triggering factor(s). It is a poorly understood inflammatory condition may have possible genetic or nutritional factors involved. It has been seen in many breeds though larger breeds show a higher incidence. It is most commonly seen in the Dobermann, less commonly in the GSD and Great Dane.

Age of onset is between 5-8 months. Males are more commonly affected.

Symptoms – This condition presents as a shifting lameness in young dogs with no swelling of growth plates. It affects the long bones of any leg with a shifting lameness pattern. Usually only one leg is affected at any one time. Pain is exhibited when firm pressure is applied across the mid-shaft of the affected long bone. The pain can be quite acute. Most commonly affected bones are the humerus and femur.

Diagnosis - X rays show increased intra-medullary density in the affected long bone.

Treatment – This condition responds well to rest, the use of low grade anti-inflammatories and antibiotic therapy. Treatment is usually required for a minimum of 3-6 weeks.

Diet – Ideally, ease off concentrated high protein foods in maintenance level (22-24% protein, 10-14% fat) in order to slow down the rate of weight gain. Recovery is generally excellent.

At this time, there is no known hereditary component and affected animals can be used for breeding.

Hypertrophic Osteodystrophy

HOD – hypertrophic osteodystrophy is an inflammatory disease affecting the ends of the long bones in rapidly growing puppies of large to giant breeds. Great Danes, Mastiffs, Bull Mastiffs and Weimeraners are among the more commonly affected breeds. Rarely seen in the GSD but has been recorded.

Age of onset is between 3-6 months. Males are affected more than females.



Causes are not fully known. It may possibly be immune system related (inappropriate response to vaccines in some breeds). Equally, it could be related to over nutrition or more likely, infectious depending on timing of exposure to the infective agent. It usually only affects one or two puppies in a litter.

Symptoms – There is often a sudden onset of acute lameness, rapidly progressing to a refusal to move at all. Affected puppies spend most of their time lying down. All four legs are usually affected with painful swollen distal (lower) growth plates of the radius, ulna and tibia. These puppies present with high temperatures and episodic lameness, where the forelegs are usually bilaterally affected with painful swollen growth plates just above the wrists. They are very depressed and reluctant to move.

Diagnosis - X rays show a very distinctive increased density around the growth plates to the lower limbs.

Treatment – Puppies with this condition respond well to rest, aspirin/anti-inflammatory drugs and antibiotic therapy. The diet needs to be one of restricted energy intake until they have recovered and then maintain a steady weight gain. Recovery is generally good depending on the initial severity of symptoms.

This condition is not currently considered to have hereditary components.

Conditions affecting the back and spinal cord in the GSD

Cauda Equina (acquired lumbosacral stenosis)

There can be three parts to this disease congenital stenosis (narrowing) of the spinal canal in the lumbar sacral area, sacral osteochondrosis (inflammation) and transitional lumbosacral vertebral segments. These three conditions may be congenital (few seen) or more commonly developmental, and can occur singularly or most often appear in concert with degenerative disc disease at the lumbo-sacral junction. The syndrome results in sensory and/or nerve dysfunction due to compression, destruction or displacement of the nerve roots or their blood supply.

Cauda Equina– GSD's appear to be predisposed. Seen in many other medium to large breeds including the Labrador, St Bernard and cross breeds, generally over 8 years of age. Incidence in the GSD – moderate to high – probably in excessive of 30%, in reality could reflect the %'s seen in spondylitis but many cases are relatively stable.

Symptoms - The classic syndrome is seen in the older dog, usually over 5-6 years of age (over 8-9 years more frequently), with affected dogs showing difficulty in rising, pain and lameness in the hindquarters, often more severe in 1 leg than the other. The more advanced cases may have faecal incontinence (urinary incontinence less commonly), the tail may have limited movement or even a flacid paralysis. On a lateral X-ray of the pelvis, the changes around the lumbo-sacral junction are very obvious. Stress radiographs can be taken (the hindquarters flexed up and/or down) showing instability or disc protrusion and calcification.

Differential Diagnosis - As these symptoms are very similar to HD in the older dog in particular, these different syndromes must be properly differentiated in order to treat them correctly. In the older GSD, the more severe cases showing nerve dysfunction also have to be differentiated from cases of degenerative myelitis.



Treatment - most dogs respond well to rest, use of strong anti-inflammatory agents for several weeks and will often stabilize on ongoing medication. In the younger animal and/or severely affected individual where there is considerable nerve pinching from disc protrusion, surgery to remove the disc may be warranted. Many of the older dears do appreciate long coats over their backs and pelvic areas during the colder months.

Prognosis – depends on the severity of symptoms, however most respond well to rest, adequate medication and can survive for years on good management techniques. Those animals with faecal or urinary incontinence are obviously more severely affected and their long term prognosis can be poor unless there is very good (and rapid) response to medication; these dogs are candidates for disc removal surgery, but often their advanced age may preclude this being really feasible. Newer methods are being developed to assist that do not involve major surgery.

Spondylitis

Spondylitis - This condition results from inflammation around the base of the vertebral bodies, resulting in a lapping of new bone formation between many vertebrae along the back. Occurs in a many medium to large and giant breeds, especially GSD's, Rottweilers and Great Danes. Spondylitis can also occur cross breeds, in reality can appear in any breed, the highest incidences in the heaviest, fast growing breeds and individuals. It is not considered a genetic condition, however, GSD'S are considered to be over represented.

Incidence – quite high. – probably in excess of 80% in the older dog.

Age seen – from as young as 2-3 years of age but generally from 5-6 years onwards with the heaviest incidence above 8 years of age.

Cause – specific causes yet to be defined but as the incidence is highest in the heavier breeds, one has to consider whether rapid growth rates could in turn set off minor OCD lesions along the vertebral facets in the young rapidly growing dog. Many younger dogs can become quite sore over the back, arching is common and this generally settles with rest, and occasionally anti-inflammatories. This then may set the stage for future degenerative changes

Symptoms – arching over the back, pain on rising and on palpation along the back. On X-ray the characteristic lipping and new bony bridges linking between various thoracic and or lumbar vertebrae are clearly visible. Many dogs can have quite extensive changes that actually fuse the vertebrae together, these changes are stable over long periods of time, and however they can flare up in colder weather and with excessive exercise. Slipping can fracture or crack the bridges, creating excruciating pain.

Treatment – rest and use of anti-inflammatory drugs usually works very well. Acute cases may require 4-6 weeks rest. Weight should be reduced if well above normal. Care with adequate housing and coats in the colder weather will assist.

Prognosis - Severe cases may have a poor prognosis if there is nerve dysfunction and pinching secondary to the arthritic changes. However most cases can be reasonably well managed for years.



Diskospondylitis

Diskospondylitis – inflammation and **infection** of the ends of vertebral bodies – usually only in 2-3 sites along the back. Occurs in medium to large and giant breeds, GSD's, Rottweilers and Great Danes, crossbreeds. It is not considered a genetic condition. Incidence low- usually less than 5% in the GSD.

Average age 4-6 years, males outnumber females 2:1. Can be as young as 3-4 months.

Symptoms - can vary from mild to acute onset. Signs of pain include difficulty in rising, arching over the back, reluctance to jump, stilted gait, occasionally ataxia or paresis of the hindquarters. Any disk space can be affected, most commonly the lumbar vertebrae and the lumbar sacral junction. Causes bacterial – generally staph infections.

Treatment for minimum 6 weeks on strong antibiotics and anti-inflammatory agents. Ongoing treatment with anti-inflammatories is often required, occasional bouts of severe inflammation may require repeat long courses of antibiotics (less commonly in the GSD, more commonly in the Rottweiler).

Prognosis - Long term outcome depends on the infection and degree of spinal cord damage. Generally good long term with very good outcome depending on the degree of nerve damage – usually stable after treatment.

Chondrodysplasia in GSD's

Definitions :

Chondrodysplastic - Shortened long bones, normal to slightly shorter depth of body, normal head. From the term **achondrodysplastic** - meaning a lack of development of the long bones of the legs, with well developed head, chest and trunk.

Chondrodysplastic "dwarf" and/or **achondrodysplastic "dwarf"** - Refers to the "dwarfed" nature of the shortened limbs, and is a condition that is unrelated to the true pituitary dwarf.

Pituitary Dwarf - Insufficient growth hormone, resulting in a very small all over puppy - a "minature" GSD with associated growth and other hormone deficiencies as they age (hair loss, abnormal skin etc).

Chondrodysplasia has appeared sporadically within the GSD population in the past and doubtless will do so again. It turns up in several forms over time. It is not a new condition, nor specific to Australia - cases were seen and noted some 20 years ago and sporadically occur over the years. A quote from Willis in 1977 states :-

"Achondroplastic type dwarfs which result in early termination of long bone growth and then rapid increase in width are not rare in dogs. Some breeds are achondrodysplastic dwarfs eg Dachshunds; and in other breeds like the Alaskan Malamute, the condition appears as a recessive trait. It is not improbable that such dwarfs arise at



An affected male pup, at 5 weeks of age

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intervals in every breed and have done for many decades, but they are of minimal importance since they can be rapidly identified and culled [ie. removed from the breeding population]."

Chondrodysplasia can occur in many breeds, often on a sporadic nature. Some breeds have deliberately been selected for chondrodysplasia eg. the Dachshund, the Basset, etc. Chondrodysplasia can cause minor to severe shortening of the long bones. This again can vary between breeds. In the Alaskan Malamute, the chondrodysplastic "dwarfs" seen are as a result of a very breed specific anaemia with early death of red blood cells, creating a unique blood picture that can actually be tested.

As far as we can find out, chondrodysplasia where it appears, is considered to be an autosomal recessive condition in most breeds - however, this too can vary - as stated in an article on the Havanese breed. Chondrodysplastic breeds eg. the Basset, the Dachshund or the Corgi breeds, which are chondrodysplastic by design, generally lead normal lives with minimal health problems.

Current Situation in Australia :

In early 2001-3 there were 8 confirmed cases of Chondrodysplasia in the GSD. What we are seeing is the shortening of the long bones with full development of the normal width of bone ie. body size is relatively normal - similar to the Basset in leg length, heavy bone, big body, short legs (all 4).

All the cases seen in the GSD are very short in all 4 limbs with no intermediate cases, ie.varying lengths of foreleg.

All but 1 of these cases have been sired by the same dog, but one should stress that there have been some 500 puppies born from this sire as of December 2003, and obviously the vast majority are normal, healthy puppies. Bitch lines of the affected litters vary considerably with numerous $\frac{3}{4}$ and sibling (to the dam) matings having normal litters.



The same affected male pup as shown above, at nearly 8 weeks of age, with his litter brother for comparison.

Possible Genetics :

What was finally determined about this dog was that it is most probable that he had had a mutation during his embryonic development such that around 1 in 100 sperm produced an abnormal puppy. This appeared to be a dominant gene (ie. if you get the gene, it is exhibited, there are no hidden carriers).

The Advice given was : Affected puppies obviously should not be bred from and be desexed.

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An affected young female, at 9 months of age (photos actually taken 22.11.2003).

Summary :

Chondrodysplasia is readily diagnosed before 8-10 weeks of age. Affected animals can be removed from the breeding programs. The incidence should be noted, pedigree information forwarded to the GSDCA