BEAGLE DWARFISM SYNDROME

CHONDRODYSTROPHY OR THE "FUNNIES”

3/2024--Currently, I have reports of beagles from three litters that have multiple “possibly affected” adult offspring with varying degrees of expression. I say “possibly affected” because we do not have a test for this syndrome. These three litters are not closely related. The physical presentation of these beagles fit the description of the Beagle Dwarfism Syndrome (BDS) as described in the literature. This is a great opportunity to continue research on this syndrome and I am in discussion with a researcher at UC Davis to possibility restart the research.

On January 18 2007, Dr. Mark Neff of U.C. Davis called CWBC President Claudia Anderson to tell her that the previous day he had a significant breakthrough in identifying the genetic marker for chondrodystrophy-dwarfism in beagles (BDS). Dr. Neff stated that they have narrowed the location of the mutation that causes chondrodystrophy (dwarfism-BDS)to 30 genes in the same region on chromosome 6. While more research will need to be done to further determine the exact genes involved, Dr. Neff stated that with the information they have, “they can begin to say that a specific Beagle does or does not carry the gene that causes the dwarfing condition". Beagle Genetics Summary from Dr. Neff -2007. Unfortunately research did not continue after Dr. Neff successfully developed the MLS marker and left UC Davis.

There is NOT a genetic test available at this time (2024) for this disorder.

This condition has been called chondrodystrophy or the "funnies" in beagles for decades. Another name for it is Skeletal dysplasia or chondrodysplasia. Even these terms causes confusion as they are used to describe other conditions associated with chondrodystrophy in the research literature. I personally call the syndrome we see in beagles- Beagle Dwarfism Syndrome (BDS) to try to lessen the confusion. It is a form of dwarfism that is NOT related to the new IVDD Chondrodystrophy test now offered by many labs. To read more about this new test please read my statement on "The New IVDD ChrondystrophyTest”.

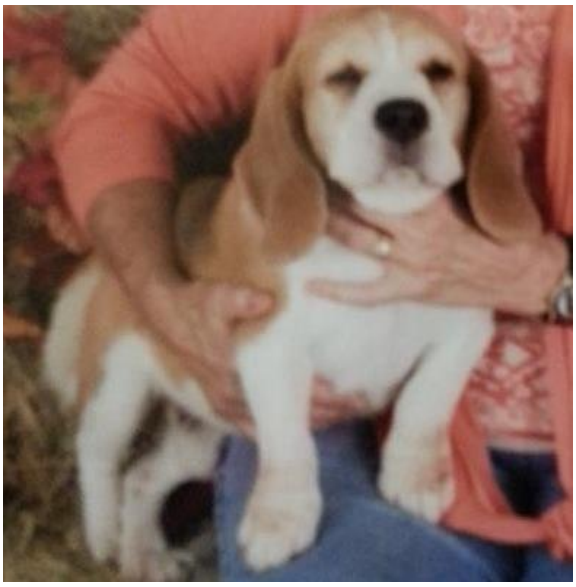
Mildly affected puppy and adult.

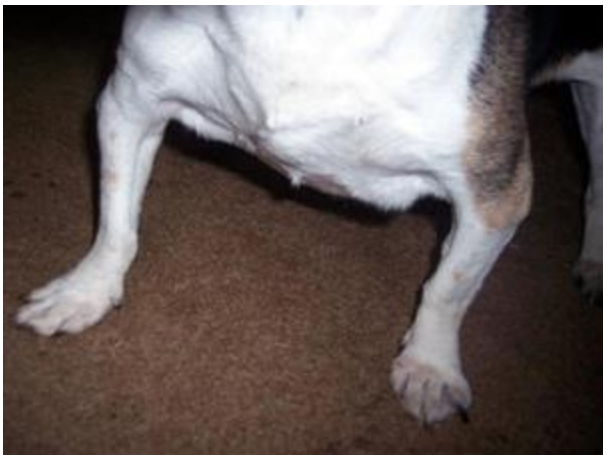
Page 2:

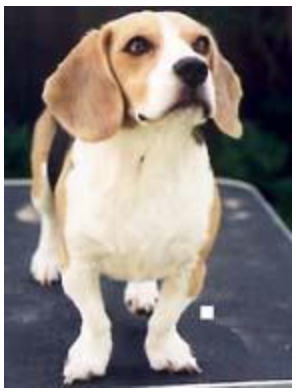
Beagles with BDS can be affected in varying degrees. Some have minor defects as pictured below and others are severely affected. Many survive well into geriatric years and are beloved pets. Beagles affected with BDS may be 13s" while others may be 15s". I personally have been at three Beagle Nationals where beagles with dwarf traits were being shown in the conformation classes. Several other beagle breeder judges have reported having suspected dwarfs being shown to them in conformation classes at all breed shows. The mildly affected puppies may not exhibit the crooked front legs at first; but may become more apparent as the pups start to mature. Owners/breeders need to be aware that crooked front legs may very well be an indicator of BDS. Breeders have reported that some of these puppies seem to be extra fuzzy with thicker hair. Breeders and owners have also expressed the observation that those beagles mildly affected seem to be very personable, extremely smart, and very trainable. ***A beagle with this genetic problem will often have crooked front legs, a short neck, a large head for body, a curved back and an awkward gait.***

Pictures of puppies with suspected BDS.

Page 3: Here are pictures of various beagles with crooked front legs and other indicators of possible BDS.

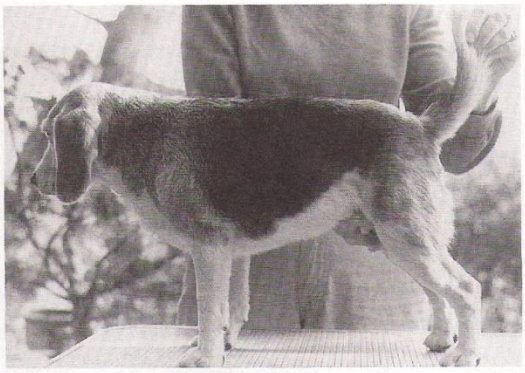




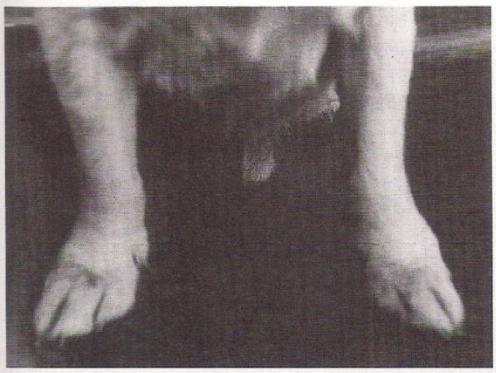


Page 5: Previous Docmentation of BDS

Here are excerpts and pictures from “The New Beagle” Authors Judith Musladin MD,Anton Musladin MD and Ada Lueke describing the indicators of this syndrome.

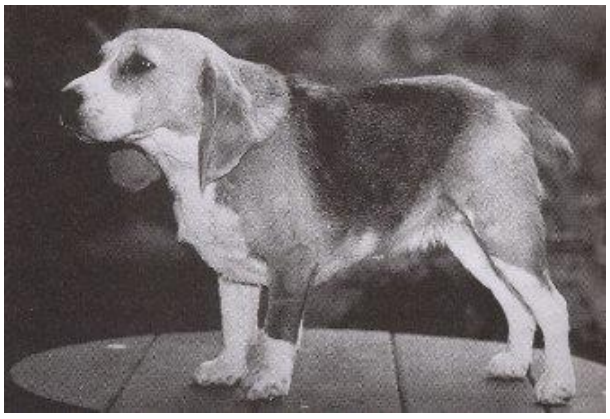


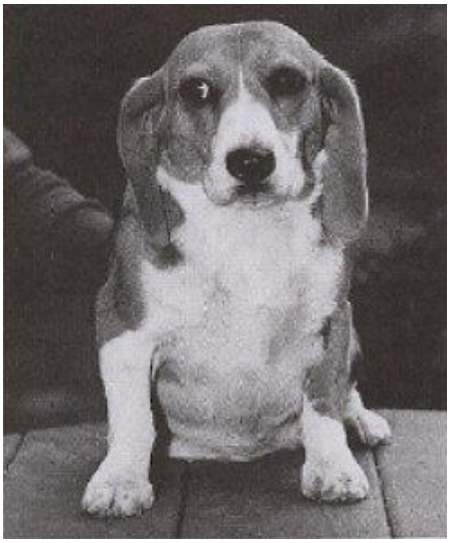
Banty, an adult male with a less severe form of chondrodystrophy.



Banty, showing a typical deformity of the front legs.

Severe BDS: Note the shortened neck, curved back and deformed front and rear legs. Pictures by Diane Quenell, published in *The New Beagle.* 1998 Edition. Permission for posting by authors.





Note the position of the front legs.

Page 6: Historical information published in “ The New Beagle”

Chondrodystrophy or "the Funnies"

Your litter has arrived. The smallest pup seems slow to nurse and less vigorous than its siblings. Supplemental feeding is needed, and soon you must contend with diarrhea as well. After a week or ten days of fluid supplementation and antibiotics, your pup seems to be catching up and is nursing along with the rest. Development seems to be normal. Up on its feet by three weeks, it is hiking around the whelping box. One night, it starts to scream and is unable to put weight on one of its forelegs. You assume that it twisted its leg somehow and try to make it comfortable. Within a day or two, all seems well. But not so!

By about four weeks, it seems to be having difficulty getting up on its feet and moves with a shuffling gait. Plucky, very responsive and affectionate, the puppy becomes special. Visits to your veterinarian, treatments of various kinds and a variety of diagnoses become the story of this pup's early weeks.

Reaching four to six months of age, your pup seems completely comfortable, and the condition has stabilized. At this point, your pup is small, has crooked front legs, a roach to his back, walks with a limp and shows weak and cow-hocked rear quarters. Skin is frequently itchy, and your pup will rub its back just above the tail on whatever is available. Intelligent, affectionate and less active than the usual, your pup makes a marvelous companion.

Occurrence in Beagles: Over the last thirty-two years, sixty-one Beagles with pedigrees have been reported to us, along with verbal reports of others without specific identification, that most likely had or have chondrodystrophy.

It was only during the 1987 to 1988 period that a diagnosis of these "funnies," as they are affectionately known, was made. These cases range in severity from a fourteen-day-old puppy that had to be put down for failure to thrive and inability to move around to a mildly affected five-year-old that has a slight roach and a rearquarter limp. Varying degrees of involvement lie between these extremes.

Generally, one affected pup may appear in a litter; however, in one litter we know of, three were affected. Repeat breedings have produced normal puppies. In our kennel, the pattern is one in which the C-6 and L-7 vertebrae seem especially targeted. We would suspect that it varies from line to line.

bred, care should be taken to find partners from a family free of chondrodystrophy. Even then, an affected puppy may turn up, because this is obviously a trait bred into the Beagle's genetic history.

It is important to recognize chondrodystrophic puppies, because misdiagnosis can be terribly discouraging. For the first twenty-five years, those cases produced in our kennel were variously diagnosed as having vitamin D deficiency, septicemia of the newborn or injury to one or more of the joints; a variety of treatments was advised.

Pain relief (aspirin works nicely) and protection from injury can see the plucky little ones through the acute phase of the process. Their life span is no different from that of the uninvolved Beagles.

Page 8: Additional Literature

Pictures of Scotty –A dwarf owned and loved by Trish P. Scotty's DNA was submitted and utilized in Dr. Neff's original research.

This excerpt is from the CWBC Newsletter. *Excerpts of an article by Claudia Anderson*, TwainHeart Beagles Woodland, WA
(Pictures used on this site were not published in the original article. Reproduction of text or pictures is not permitted.)

"Chondrodystrophy, also known as Chondrodysplasia and "the Funnies," is a kind of "dwarfism" caused by abnormal growth in the leg bones and vertebrae of dogs. Beagle puppies who are born with the disorder usually exhibit signs about 3 weeks of age. Usually they are significantly delayed in walking or they start walking normally, and then suffer a collapse that inhibits them from walking. The effects of the disorder range from mild to severe. In mild cases the dog may have periodic bouts of pain while growing, but these can be managed with pain medication and the dog can live a fairly normal life. In severe cases, the dog is crippled to the point that euthanasia is the most humane choice."

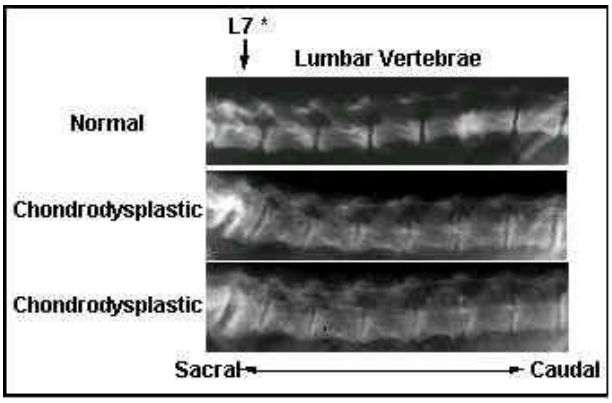
"Most breeders rely on the appearance and behavior of the puppies to diagnose Chondrodystrophy(BDS). However, a more definitive diagnosis can be obtained through X-rays. X-rays of an affected dog will show abnormalities in the bony growth centers of the long bones and vertebrae. There is also evidence that Chondrodystrophy(BDS) affected Beagles lack sinus cavities. The< best time to diagnose the disorder is around 8 weeks, although x-rays will show the disorder as early as 3 weeks. By the time the dog is four months old, the changes in the bone will make the diagnosis more difficult. Chondrodystrophy is a genetic disorder that occurs in other breeds, as well as Beagles. Chondrodystrophy has been well researched in Alaskan Malamutes. The research with Alaskan Malamutes determined that the genetic inheritance of the disorder is a simple recessive - that is, the sire and dam must each carry a gene in order to produce a puppy affected with Chondrodystrophy (Journal of the American Veterinary Radiology Society, May/June, 1975). Without researching the disorder specifically in Beagles, one cannot say for certainty that what is true of Alaskan Malamutes is true of Beagles."

Page 9: Additional Information continued

The following information is from an article printed in the Columbia-Willamette Beagle Club November 2000 Newsletter. The article was written by Dr. Mark Neff from Berkeley University. Excerpts are published here with permission from the Beagle Bugler Editor.

"DIAGNOSTIC: Previous research showed that affected pups exhibited radiographic punctate ossifications in the metacarpals and metatarsals. This was confirmed with radiographs of pups from our pedigree. However, this method of diagnosis was limited in that older animals (> 7 weeks) no longer exhibited these signs. With the help of several veterinarians, we found a common feature among older affected dogs a compressed seventh lumbar vertebrae (L7). This key finding allowed for all dogs to be definitively diagnosed radiographically, either by the presence of punctate ossifications (< 7 weeks) or by a compressed L7 vertebrae (> 7 weeks) (see figures below).

NOTE !! Since Dr. Neff's research ended there has been a few beagles that appeared to be affected that did not have the malformed vertebrae 7.



GENETICS:Beagle Chondrodysplasia: We assembled a large multi-generation pedigree of beagles (n = 354) that segregated rhizomelic dwarfism resembling human chondrodysplasia punctata. The beagle disease segregated with an apparent autosomal recessive mode of inheritance, although a significant deviation from the expected ratio existed between the sexes (9 males and 22 females) ..... Several disease phenotypes showed variable expressivity (e.g., dwarfism) or incomplete penetrance (e.g., closure of the frontal sinuses)."

What does all that mean???- Basically the mode of inheritance is "thought" to be autosomal recessive with varying degrees of expression or incomplete penetrance. This means that to have the syndrome a beagle must have inherited a recessive gene from both parents. Both parents are a carrier. Each affected beagle may exhibit a different severity of the disease with some only being mildly affected and others being severely affected-thus "varying degrees of expression or incomplete penetrance." Littermates may be carriers and this genetic time bomb may not appear again for many generations. Careful study of potential breeding partners of any litter mates should be done to identify "at risk" pedigrees. Research to identify a genetic marker was underway but in 2001 was cancelled due to lack of funding. Any beagle affected SHOULD NOT be bred. **PROGNOSIS**: Mildly affected beagles can live long lives and tend to be very people oriented since they usually get extra attention and handling as puppies. More severely affected beagles may have to be euthanized, especially if other problems appear as well.

If you have any pictures of dwarfs you have owned or bred and would approve of them being added to this overview,, please contact me at beaglehealthinfo@gmail.com