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Clinical Report

Chondrodysplasia in a German Shepherd Dog

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Abstract

Case description- A three-month-old male German Shepherd dog, with signs of instability to stand, ataxia and radiographic symptoms of chondrodysplasia is presented. The symptoms were developed since birth.
Clinical Findings- On physical examination, the affected pup did not show any swelling, pain or other abnormality in the long bones by palpation, but he had ataxia in walking. Ocular examinations revealed no lesions. In radiography, the distal right and left ulnar metaphysis were flattened and the physes were much wider than normal. The carpal bones were smaller in size than those in normal age. An increased radiopacity (sclerotic band) in the metaphyseal part of both radial and ulnar bones was observed adjacent to the physes. Radiographs were also taken from ribs and there was no abnormality in costochondral junctions.
Treatment and outcome- There is no specific treatment for this disorder. The pain can be alleviated with anti-inflammatory/analgesic drugs (eg. aspirin)**.** In this case, the dog was euthanized upon the owner's request. According to the radiographic findings and our clinical observation, chondrodysplasia was diagnosed.
Clinical Relevance- There is no definitive treatment for such cases and the management program depends on the owner and the veterinarian decisions. It is better to stop breeding of these animals.
Key Words- Chondrodysplasia, German Shepherd, Dog

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Case Description

Chondrodysplasia is a genetic disorder which manifests in puppies born with deformities. In this survey, a three-month-old male German Shepherd dog weighing 10 kg was referred to the Teaching Hospital of the Veterinary Faculty of Ahvaz University in June, 2007. The owner's chief complaint was inability to stand and ataxia of the pup. The affected pup did not have any swelling, pain or other abnormality in the long bones by palpation. On physical examination, the pup did not have hypermobility of any joints, nor did he have thin or hyperextensible skin. Ocular examinations failed to reveal any abnormalities. Vital signs were within normal limits. Vaccination and deworming programs were accomplished during the last two months. Puppy was fed with cooked chickens heads and legs. There were no abnormalities in the hematologic and biochemical profiles particularly calcium (10.1 mg/dl) and phosphorus (9.6 mg/dl). The pup was referred to radiology department for further evaluation of the limbs. The pup appeared to be phenotypically abnormal from the birth. Based on owner's statement, stand intolerance was observed when the animal was about three-week-old. Retarded growth was not observed in affected pup. Lateral deviation of the forelimbs was a significant finding. In radiography, the distal right and left ulnar metaphysis were flattened and the physes were much wider than normal. The carpal bones were smaller in size than those in normal age. An increased radiopacity (sclerotic band) in the metaphyseal part of both radial and ulnar bones was observed adjacent to the physes. Lesions are best seen in Fig. 1 and 2. The vertebral bodies were radiographically unaffected.

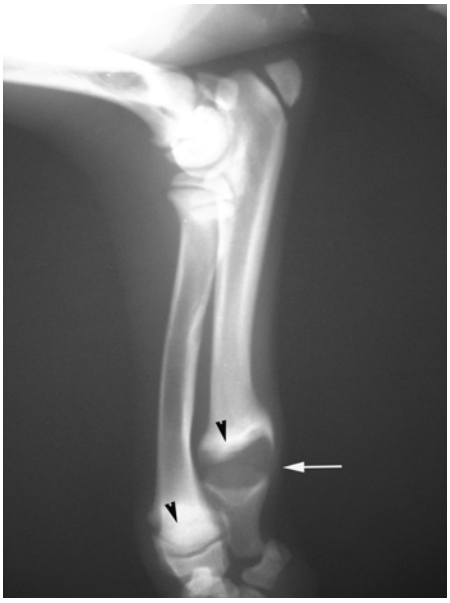

Figure 1- Lateral radiographic view of left distal radius and ulna. The growth plate (white arrow) of ulna is much wider than normal in littermates. Radiopaque band (black arrow heads) near the physis could be observed.

Figure 2- Dorsopalmar radiographic view of right carpus. The carpal bones are smaller in littersize (white arrow). The growth plate (white arrow head) of ulna is wide.

Treatment and Outcome

Since the disorder is a genetic one, there is no specific treatment for it. Of course pain can be alleviated with anti-inflammatory/analgesic drugs (eg. aspirin)**.** In this case, the dog was euthanized due to owner's request.

Discussion

Chondrodysplasia results in disproportionate dwarfism and has been reported in a number of breeds, including Alaskan Malamutes, Norwegian Elkhounds, Great Pyrenees, Scottish Deerhounds and Bull Terriers.[1] In this study, we saw this disorder in a German Shepherd dog, which is a rare case.

Many of these disorders are inherited and known to be single autosomal recessive defects. Limb shortening with cranial and lateral deviation of the forelimbs and enlarged carpi are common clinical signs. Abnormalities appear to be limited to the long bones and the cuboid bones. All appendicular growth plates can be affected, but lesions are best seen in the distal ulnar physis and the metaphysis. Asynchronous growth of the ulna produces angular limb deformities.[2,3] The form of chondrodysplasia in our case was similar to that described in other breeds of dogs. The first report of chondrodysplasia in dogs was that by Hansen, who described chondrodysplastic Dachshunds and French Bulldogs. Subsequently, various forms of chondrodysplasia affecting a Cocker Spaniel, a German Shorthair Pointer, and Norwegian Elkhounds have been described.[4]

Osteochondrodysplasia was distinguished from similar disorders such as pituitary dwarfism and congenital hypothyroidism based on radiographic features, clinical examination and chemistry. In pituitary dwarfism, the soft puppy-hair coat is retained initially, but symmetric alopecia and hyperpigmentation develop with age. Accompanying abnormalities include abnormal behavior, delayed dental eruption, soft mandible, cardiac disorders, cryptorchidism, megaesophagus and testicular atrophy or estral abnormalities. Radiographically, limb bones are shortened, with delayed closure of growth plates. Epiphyses may show disordered and incomplete calcification.[2]

In congenital hypothyroidism, nonskeletal findings include delayed dental eruption, macroglossia, lethargy, mental dullness, persistent puppy hair coat progressing to thinning and alopecia, mild nonregenerative anemia and hypercholesterolemia. The radiographic features are epiphyseal dysgenesis and delayed skeletal maturation.[2] We did not see any above signs in our case by clinical, chemical, hematological and radiographic examinations.

Chondrodysplastic Alaskan Malamutes exhibit concentrations of calcium, phosphorus and magnesium in ulna and humerus bone segments similar to those of non- chondrodysplastic dogs of similar age.[5] In this study, calcium and phosphorus levels were in a normal range.

The urinary excretion of free, total and non-dialyzable hydroxyproline appeared to be similar in both chondrodysplastic and non- chondrodysplastic Alaskan Malamutes in different ages.[6] In our study, measurement of hydroxyproline was not accomplished.

A Boxer puppy had an unusual dysplastic lesion of the distal epiphysis of the left femur. Biopsy and CT examination were performed. A diagnosis of dysplasia epiphysealis hemimelica was made.[6]

More than one hundred different types of skeletal dysplasia have been described in human beings, and an internationally recognized system of classification has been developed.[7]

According to this system, the chondrodysplasia in our case would best be classified as an osteochondrodysplasia with abnormalities of cartilage and growth plates in ulna.
Radiographic changes may be detected in dogs as early as 7 to 10 days of age but can be more definitively diagnosed between 5 and 12 weeks. We saw lesions in 3 months.[7] We couldn't estimate the onset of the disease because the animal was not referred to us earlier. Chondrodysplasia associated with ocular defects has been described in Labrador Retrievers, Samoyeds, and German Shepherd dogs.[2] We didn't observe any lesions in eyes via ophthalmoscopy.

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چکیده

کوندرودیسپلازی در یک سگ ژرمن شفرد

بهمن مصلی نژاد ، علیرضا غدیری ، رضا آویزه

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توصیف بیمار- یک سگ ۳ ماهه از نژاد ژرمن شفرد، با علائم آتاکسی و عدم توانایی در ایستادن همراه با علائم رادیوگرافی کوندرودیسپلازی ارائه می شود. علائم از بدو تولد ایجاد شده بود.

یافته های بالینی- در معاینه بالینی و از طریق ملامسه، هیچگونه علائم تورم، درد و دیگر موارد غیر طبیعی در استخوان های بلند حیوان دیده نشد. معاینات چشمی نیز هیچگونه ضایعات را نشان نداد. در رادیوگرافی، متافیز استخوان اولنار، در بخش دیستال سمت راست و چپ ، تغییر شکل یافته و نسبت به حالت طبیعی پهن تر بودند. استخوان های مچ دست، نسبت به سگ های همسن و سال خود کوچک تر بودند. همچنین یک افزایش دانسیته (نوار اسکلروزه) در بخش متافیز استخوان های رادیوس و اولنار نزدیک به استخوان مچ دیده شد. محل اتصال غضروف به دنده ها نیز طبیعی بودند.

درمان و نتیجه آن- درمان اختصاصی و یا مراقبت ویژه برای این عوارض وجود ندارد. البته می توان درد را با داروهای ضد التهاب غیر استروئیدی نظیر آسپیرین درمان کرد. در این مورد، حیوان، به دلیل اصرار صاحبش یوتانازیا (مرگ آسان) شد. با توجه به یافته های رادیوگرافی و مشاهدات ما، کوندرودیسپلازی تشخیص داده شد.

کاربرد بالینی- در چنین مواردی، درمان خاصی وجود ندارد. برخورد با آن بستگی به نظر صاحب حیوان و دامپزشک دارد. بهتر است که از چنین حیواناتی به منظور ازدیاد نسل استفاده نشود.

کلید واژه گان- کوندرودیسپلازی، ژرمن شفرد، سگ