

## Carpal flexural deformity in puppies

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**ABSTRACT:** Carpal flexural deformity was determined in a total of 31 puppies, of which 28 were brought to our clinic, and 3 were reported by a practicing veterinary surgeon. Ages of the puppies ranged between 6–24 weeks. The dogs belonged to 10 different breeds. Following clinical and radiological examination of the puppies, blood samples were taken and calcium (Ca), phosphorus (P) and magnesium (Mg) values were recorded. Slight increases in these mineral values were determined in some of the patients. A splint with a caudal aluminium support, padded with a large amount of cotton, was applied to all puppies with deformity. This splint was kept on for 10 days, and repeated in some cases. The diets of the puppies were planned.

**Keywords:** carpus; flexural deformity; dog

Flexural deformity of the carpus is encountered more frequently in foals, calves, piglets and lambs, while rarely in dogs (Wagner et al., 1985; Vaughan, 1992; Denny and Butterworth, 2000). This disorder has been described as congenital in newborn foals and acquired in rapidly growing 10–18 month old foals (Wagner et al., 1985; Auer, 1999; Hay and Mueller, 1999).

Congenital deformities are multifactorial (teratogenic agents, intra-uterine mal-positioning, diseases of the mother during pregnancy etc). Acquired deformities can occur due to trauma, infectious polyarthritis and nutrition (Auer, 1999; Hay and Mueller, 1999).

Splint, casting and intravenous oxytetracycline administration is used for the conservative treatment of flexural deformities of the metacarpophalangeal joint in horses; and diet planning and corrective shoeing is used in acquired disorders. In cases unresponsive to treatment, inferior and proximal check desmotomy is applied (Auer, 1999; Hay and Mueller, 1999).

The aim of this study presents carpal flexural deformity cases in dogs, which are rarely brought to our clinic and seldomly reported in literature, from the clinical and biochemical point of view.

## MATERIAL AND METHOD

The material of this study comprised of a total of 31 puppies with carpal flexural deformity, of which 28 were brought to the surgery clinic with complaints of deformed legs and gait abnormality, and 3 reported by practicing veterinary surgeons, in the 4-year period between 1999 and 2003.

Following clinical examination of the puppies brought to the clinic; antero-posterior and medio-lateral radiographs were taken of the areas distal to the elbow joint in the affected limbs. A detailed history was obtained from the patient owners. Age of the patient, feeding method, relationship with littermates and parents, duration of the disorder, medication used and vaccination status was established in the history.

Blood samples were collected from the puppies brought to the clinic and Ca, P and Mg values in blood were investigated. Following diagnosis at the time of presentation to the clinic, a splint with a caudally placed aluminium support, with a large amount of cotton padding was applied to all cases in which the lesion was identified. Patients were called back approximately 10 days later, and status of the extremities and standing position was

evaluated. The splint was continued in cases that were considered necessary. Afterwards, patients were called back at regular intervals, and the lesions were followed up. Following diagnosis, appropriate balanced commercial foods were planned for dogs fed the wrong food.

## RESULTS

The breeds of the dogs evaluated in this study were listed as; Anatolian Sheepdog (8), mixed breed (6), Rottweiler (5), English Setter (4), German Shepherd (3), Irish Setter (1), Italian Pointer (1), Doberman Pinscher (1), Staffordshire Bull Terrier (1), Pitbull Terrier (1). The ages of the puppies ranged between 6–24 weeks. The deformity was seen to occur most frequently in the 6–8 week period.

The puppies were brought to our clinic between the 2<sup>nd</sup>–30<sup>th</sup> days of the start of the deformity. Carpal flexural deformity had formed bilaterally in 27 puppies (Figures 1 and 2) and unilaterally in 4 (Figure 3).

None of the puppies we examined had any other disease. They had not encountered any previous trauma. It was pointed out that the 3 cases reported by a practicing veterinary surgeon had suffered from parvoviral infection, and that this deformity had occurred towards the end of the treatment.

All affected puppies had been separated from their mothers a short while (10–15 days) before, and had been generally feeding on cow's milk and various dog foods. In 3 Anatolian Sheepdog littermates aged 8-weeks, the deformity was seen to occur in the 10 days following separation from the mother, while in the remaining littermates continu-



Figure 1. A 6-week-old Pitbull Terrier with bilateral carpal flexion and bowing, worse in the left foreleg. This dog recovered after 10 days splinting

ing to suckle the mother the deformity was not seen to occur. In the radiographs of cases with carpal flexural deformity, no macroscopic change was observed with relation to growth plates, bone and cartilage.

The deformation in the carpal joints of the patients brought to the clinic in the early stages (3 to 7 days) was easily corrected manually, and these cases recovered completely with 10-day bandages. In cases brought in at a later stage, there was an obvious contracture in the flexor tendons, particularly in *musculus flexor carpi ulnaris*.

Following examination of all cases diagnosed with deformity and those reported by a practicing veterinary surgeon, a splint with a caudally placed light aluminium support and a large amount of cotton padding was applied to the leg reaching up to the elbow joint, in order to make it easier for the puppy to walk, correct the deformation and prevent flexor tendon contracture. The splint was contin-



Figure 2. A 12-week-old Irish Setter (A and B). Appearance of bilateral carpal flexion (C and D). This dog was splinted for 10 days, and mild hyperextension occurred after splint removal



Figure 3. A 10 week-old Staffordshire Bull Terrier. A – unilateral carpal flexural deformity and bowing, B – appearance of recovered legs after 10 days splinting

ued for 10 days and repeated in cases where it was necessary. Following the removal of the splint, the carpal flexural deformity was seen to have been corrected in a case with bilateral deformity; however, a medium degree of carpal hyperextension had also developed (Figure 2). In one case with unilateral deformity, a splint was applied to the leg with the deformity. However, 3 days later hyperextension was seen to develop in the other leg. On the 3<sup>rd</sup> day, bilateral splint application was carried out in this case, and also in the remaining 3 cases with unilateral deformity.

Blood samples were collected from the puppies and calcium, phosphorus and magnesium values were investigated. Slight increases above the normal values were determined in calcium and phosphorus in 7 puppies, calcium in 3 puppies, phosphorus in 5 puppies and magnesium in 6 puppies. No change was observed in the remaining cases.

## DISCUSSION

Vaughan (1992) has suggested that Doberman Pinschers may be predisposed to carpal flexural

deformity, and that this lesion may be hereditary. Due to the cases in this study belonging to different breeds, and lack a dominant breed, we do not agree with the idea postulated by the author. The high number of Anatolian Sheepdogs in this study may be attributed to regional or coincidental reasons. We think that, not only Doberman Pinschers, but other breeds may also be inclined towards this lesion. For a certain verdict, longer period studies need to be carried out where higher numbers of cases are examined.

Auer (1999) and Wagner et al. (1985), express that deformities developing in foals may be related to excessive and unbalanced carbohydrate and protein intake, and copper and zinc deficiency. Unbalanced and excessive feeding of the offspring may play a role in the development of the deformity. Analysis of these trace elements expressed by researchers could not be done due to financial difficulties. However, it was concluded that planning of the diet given to puppies was effective in the correction of the deformity, and the disorder not recurring.

While Vaughan (1992) reported that conservative treatment was effective in most of the puppies, we do not agree with this idea, due to the high tension of the flexor tendons in the cases brought to the clinic at a later stage, and also because the disorder did not recur in those to which a bandage was applied. Recovery was seen to continue for longer in delayed cases.

The facts that; carpal flexural deformity is seen in particularly 6–10 week old puppies, that these puppies are separated from their mother a short while before and that similar to our findings, in puppies belonging to the same litter, the deformity was seen in 3 Anatolian Sheepdog puppies separated from their mother a short while earlier but that it was not seen in the remaining littermates continuing to suckle their mother, shows the relationship between this lesion and feeding. Appearance of the lesion in the later stages of parvoviral infection in 3 puppies reported by a practicing veterinary surgeon supports the idea that it may be related to nutritional deficiency.

In cases with unilateral carpal flexural deformity, as it has been observed that carpal hyperextension may develop in the other leg, we think that a splint must also be applied to the sound leg.

In our opinion, the ethiological reason for the 31 cases of carpal flexural deformity evaluated in this study is unlikely to be related to hereditary reasons, or to breed predisposition. The main reason being

feeding is a stronger possibility. Thus, we think that studies on nutritional deficiency need to be carried out. It has been determined that the lesion can be prevented with a light splint application in early stages and dietary planning with a balanced commercial food, and that the deformity does not recur in later stages.

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