Calcification is the deposition of calcium salts in tissues other than bone and teeth and may be divided into dystrophic calcification, metastatic calcification and calcinosis circumscripta [4]. In the dermis and subcutis, partial calcium deposition that has a cystic structure and contains calcium phosphate or calcium carbonate is called calcinosis circumscripta [1, 2, 5]. Deposition of calcium salts is also found in nutritional myopathy due to a deficiency of vitamin E and/or selenium and in this disease myofibers undergo necrosis and necrotic sarcoplasm undergoes calcification [3, 4, 8, 10, 11].

Calcinosis circumscripta and nutritional myopathy are rare diseases, but have been reported naturally and experimentally in dogs and cats respectively [2, 9, 10]. On rare occasions, each of them also occurs in the tongue [2, 11]. Present report describes the gross, serological and histopathological findings of calcinosis circumscripta on lingual muscle and dermis in a dog.

A 10-month old male Shi-tzu was presented with a week history of scurfy skin and whitish masses located in the ventral portion of tongue. Grossly, two whitish prominences with diameters of 3 to 4 mm were found on the underside of the tongue. Microscopically, in ulcerative epidermis, deposition of dense, amorphous granular basophilic calcium salts was separated by thin fibrous connective tissue containing mild inflammation. Many fascicles were characterized by replacement of degenerating myofibers with calcification. The precise cause of calcification could not be determined; however, it is interesting that two different lesions shown in calcinosis circumscripta and slight nutritional myopathy were also observed simultaneously only in the tongue.

KEY WORDS: calcinosis circumscripta, canine, nutritional myopathy.

Calcinos Circumscripta on Lingual Muscles and Dermis in a Dog

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ABSTRACT. A 10-month old male Shi-tzu was presented with a week history of scurfy skin and whitish masses located in the ventral portion of tongue. Grossly, two whitish prominences with diameters of 3 to 4 mm were found on the underside of the tongue. Microscopically, in ulcerative epidermis, deposition of dense, amorphous granular basophilic calcium salts was separated by thin fibrous connective tissue containing mild inflammation. Many fascicles were characterized by replacement of degenerating myofibers with calcification. The precise cause of calcification could not be determined; however, it is interesting that two different lesions shown in calcinosis circumscripta and slight nutritional myopathy were also observed simultaneously only in the tongue.

NOTE Pathology

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vitamin E and selenium deficiency of the growing dogs using modified diet [10]. There are no reports of the development of vitamin E and selenium deficiency in dogs fed commercial diet. However, necrosis and calcification of skeletal and cardiac muscle is a common finding in growing animals, especially in livestock and poultry with vitamin E and selenium deficiency [6, 11]. It was reported that myopathy in brown pelicans was probably caused by vitamin E deficiency due to feeding the pelicans a rancid diet [8].

Considering our case history, we suspected that food scraps fed to the dog of this report were likely to contain unsaturated fatty acid, which may have increased physiologic oxidative damage, consequently, inhibit uptake of vitamin E, which lead to vitamin E deficiency. Therefore...

Table 1. Blood chemistry profiles of a dog with calcinosis circumscripta on lingual muscles and dermis

<table>
<thead>
<tr>
<th>Parameter</th>
<th>GOT (U/L)</th>
<th>GPT (U/L)</th>
<th>ALP (U/L)</th>
<th>BUN (mg/dL)</th>
<th>Calcium (mg/dL)</th>
<th>Chol (mg/dL)</th>
<th>CPK (U/L)</th>
<th>Creatinine (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Range</td>
<td>7–84</td>
<td>4–125</td>
<td>14–224</td>
<td>6.8–29.6</td>
<td>7.7–11</td>
<td>&lt;330</td>
<td>51–485</td>
<td>0.4–1.5</td>
</tr>
<tr>
<td>Data</td>
<td>28</td>
<td>108</td>
<td>&lt;10</td>
<td>5.6</td>
<td>&lt;5.0</td>
<td>240</td>
<td>193</td>
<td>0.2</td>
</tr>
</tbody>
</table>

a) GOT, glutamic-oxaloacetic transaminase; GPT, glutamic-pyruvic transaminase; ALP, alkaline phosphatase; BUN, blood urea nitrogen; Chol, cholesterol; CPK, creatine phosphokinase.
fore, feeding food scraps of the table might have been partly associated with vitamin E deficiency in this histopathological observation. Unfortunately, we couldn't detect the level of vitamin E. However, analysis of blood sample showed that the dog had normal activities of enzymes and mineral contents (Table 1). Especially, CPK (creatine phosphokinase) and serum calcium, which are known as indicators of nutritional myopathy and metastatic calcification, respectively [10], were within normal ranges. Moreover, these lesions were not generalized but localized only in the tongue. Microscopically, no other lesions were detected besides calcium deposition on the lingual muscle and subcutis similar to those in calcium circumscripta and nutritional myopathy. Furthermore, these lesions were scattered between normal tissues, suggesting that the cause of calcification is not traumatic. Taken together with gross and serological examinations including history taking, there were no evidences of traumatic, metastatic and nutritional calcification on the tongue. However, it is interesting that two different lesions were present simultaneously only in the tongue.

In this report, we described gross, serological and microscopic finding about calcinosis circumscripta on the lingual muscles and dermis in a dog, suggesting that these findings in tongue were compatible with those of nutritional myopathy and idiopathic calcinosis. While the precise cause of calcification could not be determined in our case, we speculated that deposition of calcium is likely due to idiopathic.

There are no documented instances of calcium circumscripta on the lingual muscles and dermis in a dog. Therefore, this case is also valuable information to veterinary practitioners likely to encounter cases of calcium deposition in dogs.

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