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Lingual Calcinosis Circumscripta in a Captive Sitatunga

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ABSTRACT: Calcinosis circumscripta (CC) was found in a 10-yr-old female sitatunga (Bovidae; Tragelaphus spekei). At necropsy, there were two white coalescing nodules (3 × 5 × 2 cm, 2 × 2 × 1.5 cm) on the ventral side of the tongue. The cut surface of the nodules had multiple, well-circumscribed loculi with chalky appearance and gritty consistency, separated by thin strands of connective tissue. Histologically, the nodules contained multiple loculi of various sizes and shapes, which consisted of amorphous material that was pale basophilic with H&E stain, surrounded by fibrous connective tissue. Around the loculi were numerous foreign body giant cells and epithelioid macrophages; occasional lymphocyte aggregations also were seen. The amorphous material was positive for PAS and von Kossa’s stain. Calcinosis circumscripta is rare in the Bovidae.

Key words: Calcinosis circumscripta, tongue, sitatunga, Tragelaphus spekei.

Caltcinosis circumscripta (CC) is an occasional form of dystrophic calcification characterized by the formation of hard, well-circumscribed cutaneous nodules most common in dogs and humans (Dodd and Raker, 1970; Legendre and Dade, 1974; Thompson et al., 1959). It is rarely observed in the horse (Goulden and O’Callaghan, 1980) and monkey (Nielsen and Cole, 1960). There is one reported case of CC in a cow (Anderson and King, 1988). The pathogenesis of this lesion has not been established (Jones et al., 1997). It has been thought to be associated with cystic apocrine glands of the skin, and some researchers called this lesion “cystic apocrine calcinosis” (Christie and Jabara, 1964). However, CC has been rarely found in the tongue, which lacks apocrine glands (Douglas and Kelly, 1966). In wildlife, to our knowledge, no cases of CC have been reported. Herein, we report CC in the tongue of a captive sitatunga (Tragelaphus spekei).

A 10-year-old female sitatunga was submitted to the zoo veterinary hospital (Gunma Safari World, Tomioka, Gunma, Japan) because of an accidental bruise. Her condition did not improve with treatment, and she died of traumatic shock one day after submission. The animal was obtained from a commercial supplier, and maintained for display and breeding purposes. Sitatungas were grazed by day in a field, but were kept together indoors at night. They were provided with a commercial diet for livestock, fresh grass and vegetables, and tap water ad libitum.

At necropsy, there were two white coalescing nodules (3 × 5 × 2 cm, 2 × 2 × 1.5 cm) on the ventral side of the tongue. The cut surface of the lingual nodule had well-circumscribed chalky-white lobuli with a gritty consistency. The lobuli varied in size and were separated by thin strands of connective tissue (Fig. 1). The nodules were deep to the muscle, and occupied approximately one fourth of the tongue at the largest diameter. In addition, bone fractures of pelvis and rupture of the urinary bladder were observed.

Organs and tissues were collected and fixed in 10% neutral buffered formalin, embedded in paraffin, sectioned at 5 μm, and stained with hematoxylin and eosin (H&E). The lingual nodules were sliced at 1 cm, and the sections were processed to H&E sections with or without decalcification. Selected sections of the nodules were stained with periodic acid-Schiff (PAS), von Kossa’s, and alizarin red stains (Vacca, 1985). Elemental analysis of the lingual nodules was performed by a Hitachi (Hitachi-naka, Ibaragi, Japan) H-600 electron microscope in scanning mode at an accelerating voltage of 10 kV combined with an energy dispersive X-ray microanalyzer, EDAX (Mahw, New Jersey, USA).
Histopathologically, the lingual nodules consisted of multiple loculi and surrounding fibrous connective tissue. Each loculus contained various amounts of pale to deeply basophilic material, which was acellular, and of homogenous or granular appearance, very hard and easily fragmented in the specimen without decalcification. The size of loculi varied greatly, from a small collection of deeply basophilic calcified foci to a huge pale basophilic homogenous mass. There were numerous small clumps of basophilic material in the deposition, especially near the periphery (Fig. 2). Around the loculi there were various degrees of granulomatous inflammation characterized by the occurrence of many foreign-body giant cells and epithelioid macrophages. There were occasional aggregations of lymphocytes. The material in the depositions was intensely positive for PAS, von Kossa’s, and alizarin red stains.

Scanning electron microscopy of the fracture plane of the depositions was relatively rough and granular with a non-organic appearance. X-ray microanalysis on the surface revealed prominent peaks of calcium and phosphorus, with a trace amount of sodium. In addition to the tongue lesions there was moderate centrilobular fatty change in the liver, moderate atrophy of lymphoid tissue in the spleen, and mild anthracosis in the lung.

The morphological features of lingual calcinosis in a sitatunga closely resembled those of CC in dogs and humans (Jones et al., 1997; Legendre and Dade, 1974; Thompson et al., 1959). The term “tumor calcinosis” is used synonymously for this le-
tion. Whether it be called “calcinosi
circumscripta” or “tumor calcinosis” seemed
to be a matter of personal preference, for
either name is equally applicable (Dodd
and Raker, 1970). Calcinosi
circumscripta has been occasionally observed in dogs, and
humans, but extremely rare in the Bovidae
including cow (Anderson and King, 1988).
The present case seems to be the second
reported in bovids. It is uncertain why CC
has been rarely seen in the Bovidae.

In dogs, several hypotheses for the path-
ogenesis of CC have been proposed. Breed and familial prevalence has been
observed in CC in dogs; it is fairly com-
mon in young dogs of the larger breeds
such as German shepherds (Cordy, 1967).

Dystrophic calcification in cystic and
disorganizing apocrine glands is suspected
to evolve to CC. However, a relationship
to apocrine glands was not easy to trace
and did not account for lingual CC (Chris-
tie and Jabara, 1964). The onset of CC fol-
lowing subcutaneous administration of a
commercial medroxyprogesterone (MPA)
preparation has been described recently in
a few poodle bitches (Ginel et al., 1995).
Nielsen and Cole (1960) proposed that
foci of CC were totally mineralized calcifi-
cy epithelium.

Douglas and Kelly (1966) noted that since
there are no apocrine glands in the tongue,
glandular hyperplasia is not an essential
prelude to a focus of CC. Howell and Ishmael
(1968) reported six cases of lingual CC in
dogs in which the site of occurrence varied
in the tongue, such as on the tip or ventral
surface. They also examined the normal
tongues of six dogs in the area where the
lesion was expected to have developed.

The deposit in the present CC was in-
tensively positive for PAS mucopolysacar-
de, and von Kossa’s and alizarin red stain
for calcium as seen in CC in dogs (Howell
and Ishmael, 1968). Examination with the
energy-dispersive elemental X-ray micro-
analyzer (EDAX) revealed prominent
peaks of calcium and phosphorus in the
deposits. The deposits appeared to contain
calcium and phosphorus embedded within
a mucopolysaccharide matrix. The patho-
physiology of lingual CC seemed to be
similar to that seen in dogs. The etiology
of this disease remains unclear.

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