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(Myrmecophaga tridactyla)

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RECURRENT TONGUE TIP CONstriction in a Captive giant Anteater (Myrmecophaga Tridactyla)

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Key words: Constriction, diet, giant anteater, Myrmecophaga tridactyla, tongue, tourniquet syndrome

BRIEF COMMUNICATION

Zurich Zoo has housed giant anteaters (Myrmecophaga tridactyla) for the past 10 yr. No major health problems were present until 2004, when an animal required treatment for tongue tip constrictions twice within 1 yr. The mouth is one of the most common injury sites of giant anteaters, and in a health survey, a high incidence of tongue problems was detected. The 60-cm-long, retractile tongue seems to be prone to injuries because of the characteristic anatomy and feeding behavior of the species. Although tongue problems appear to be frequent in giant anteaters under captive conditions, no case report including treatment and photographic documentation exists. The following report describes circumferential tongue constrictions caused by dietary contents and discusses the necessary preventive measures.

A 10-yr-old, 47-kg, male giant anteater was evaluated over a 4-wk period for intermittent clinical signs of partial anorexia, soft stool, and minor bleeding from the mouth. The daily maintenance diet of the affected animal contained minced lean beef, dog pellets (Biomill®, Biomill SA, Granges-Marnand 1523, Switzerland), low-fat curd cheese, cereal, honey, seasonal fruits (e.g., apple, tomato, banana, kiwi), boiled egg, chitin powder (Chitosan-Powder, Districhemie SA, Ecublens 1024, Switzerland), mineral/vitamin supplement (Carnicon®, Provimil Kliwa AG, Kaiseraugst 4303, Switzerland), and peat. Ingredients were thoroughly chopped and blended together with 0.5 L water to form a soupy mixture. Insects were provided irregularly for enrichment purposes.

The giant anteater was immobilized using xylazine (Rompun®, Bayer AG, Leverkusen 51368, Germany; 3.4 mg/kg i.m.) and ketamine (Narketan® 10, Vétomiquinol AG, Belp Bern 3123, Switzerland; 13 mg/kg i.m.) for evaluation. Blood samples were taken from the cephalic vein and transferred in ethylenediaminetetraacetic acid tubes for complete blood count analyses and serum tubes for biochemical analyses. Physical examination, radiography, hematology, and blood chemistry results revealed no major findings. An endoscope with an outer diameter of 8.6 mm and a working length of 1,030 mm was used for oral examination (Olympus® EVIS EXERA Video Gastroscope GIF-160, Olympus Switzerland AG, Volketswil 8604, Switzerland). The distal part of the tongue appeared slightly edematous and swollen, and had a dark reddish to black discoloration. The tongue was advanced out of the oral cavity and two circumferential constriction bands made out of soft wood fibers were detected 15 and 25 cm proximal to the tongue tip (Fig. 1a).

Constriction bands were gently lifted away from the tongue with forceps and transected with scissors. The distal part of the tongue was cooled and disinfected with swabs soaked in 0.05% chlorhexidine solution (Hibitane®, SSL Healthcare Switzerland AG, Reinach 4153, Switzerland) for 15 min.
until a distinct edema reduction was observed. Locally, a chlorhexidine wound dressing (Vita-
Merfen®, Novartis Consumer Health Switzerland AG, Bern 3018, Switzerland) was applied. No ad-
ditional systemic treatment was initiated. After treatment, xylazine was antagonized with atipama-
zole (Antisedan®, Dr. E. Gräub AG, Bern, Switzerland; 0.4 mg/kg i.v.). The animal recovered well
from anesthesia and returned to normal clinical health within 5 days.

Further investigations revealed that wood fibers were present in the peat, which was included as a
dietary supplement to improve stool consistency. A switch to another commercial source of peat had
resulted in a peat type that included elongated fi-
bers. The risk for further problems was eliminated
by careful sieving of the peat before inclusion in
the diet.

Six months later, the same animal became ano-
rectic again, with signs of lingual discomfort as
shown by unusual intensive “licking” of the
ground. The giant anteater was immobilized and
recovered using the previously described anesthetic
protocol. During general examination, the distal
part of the tongue appeared slightly edematous and
swollen without discoloration. Two pale brown
constriction bands, of soft consistency, were de-
tected 2 cm proximal to the old scar tissue at the
tongue tip (Fig. 1b). Constriction bands were gently
removed and the distal part of the tongue was
cooled with 0.05% chlorhexidine solution (Hibi-
tane®) and locally disinfected with a chlorhexidine
dressing (VitaMerfen®). No additional systemic
treatment was initiated. Recovery was uneventful
and the animal returned to normal clinical health
within 1 day.

Histopathology was performed of the constric-
tion band of the second case. The histologic ex-
mamination revealed that the sample was composed
of collagenous fibers, which were long, thick, and
grouped into large parallel bundles that enclosed
several plant particles of variable size (Fig. 2). It
was speculated that the collagenous fibers originat-
ed most likely from tendons or fascias of the lean
meat in the diet.

Tongue constriction in anteaters clinically pre-
sents as anorexia, pain, discoloration, and edema

Figure 1a. The extended tongue of a giant anteater
during the first presentation. The distal part of the tongue
appears slightly edematous, swollen, and reddish-to-black
discolored. Two circumferential constriction bands con-
sisting of wood fibers are visible 15 and 25 cm proximal
of the tongue tip. b. The extended tongue of the same
giant anteater during the second presentation. The distal
part of the tongue appears slightly edematous and swollen,
without discoloration. Two pale brown circumferential
constriction bands consisting of collagenous fibers are vis-
ible approximately 2 cm proximal to old scar tissue at the
tongue tip.

Figure 2. Histopathology of the constriction bands of
the giant anteater during the second presentation. The
bands were composed of collagenous fibers, grouped into
large parallel bundles (CF), and several plant particles (P).
Collagenous fibers were most likely from fascias, tendons,
or ligaments from dietary meat. H&E, ×20.
distal to the constriction band. In contrast to the previous reports, excessive salivation was not evident in the case presented here.6 Signs of discomfort in the tongue may not be present in all cases. A long-term neurovascular compromise of tissue distal to the constriction will lead to loss of sensitivity and function and, finally, necrosis. Therefore, the main objective in the treatment of tongue strangulation is a decompression of the constricted tongue to facilitate free blood flow. The type of material forming the band and its size determine the method of removal; care must be taken to avoid injuring the underlying tissue. In the present cases, it was possible to identify and dissect the constriction bands with scissors. It might not be possible to identify and dissect fine, deeply embedded constriction bands. In such a case, a short, longitudinal, deep incision over the area of constriction should be considered to allow the complete section of the constricting fibres to be removed, as performed in the toe tourniquet syndrome in human medicine.8

The constriction bands in the first case were made out of wood fibers, which were present in peat, a dietary supplement of giant anteaters at the Zurich Zoo. Peat and chitin had been added to the diet to improve stool consistency because the stool produced by giant anteaters at the Zurich Zoo ranged in consistency from pasty to liquid, similar to previous descriptions.34 The risk of future problems was eliminated by careful sieving of the peat before inclusion in the diet. The second case demonstrated that fascia or tendon remains, once attached to the lean meat, are another dietary element, which could form constriction bands. Previous to these present cases, lean meat was chopped and mixed into the diet because the anatomy of the oral cavity and tongue required a small particle size to facilitate consumption. Nevertheless, it seems that the collagenous fibers were still too long, even after chopping, and became entangled during mixing or food ingestion to form elongated constriction bands. Therefore, it is recommended to remove the fascia and/or tendons as thoroughly as possible, and to provide ground meat rather than chopped meat.

The problems presented in the case of this giant anteater emphasize the problematic issues of anteater nutrition as documented in the literature and substantiated in a giant anteater diet survey.36 Namely, many diets for anteaters, although nutritionally adequate and complete, tend to be rather complex in ingredient composition. In the case of the diet used at the Zurich Zoo, nutritional adequacy was supported by calculation of a nutritionally balanced diet; a consistently good health status; reproductive success; and a good fecal consistency after the introduction of peat.4 Evidence that free-ranging anteaters ingest a high proportion of indigestible compounds provides rationale for peat or chitin supplementation. In animals that feed on terrestrial invertebrates, soil may comprise up to 50% of the dry mass in feces or stomach contents.5 Voluntary substrate ingestion by anteaters has been reported to cause constipation and gastrointestinal tract obstruction, thus supporting the readiness of anteaters to consume indigestible material.6 For this reason, the use of wood chips or sand as substrates is discouraged for anteaters; plain dirt substrate is preferred because medical problems seem to be rare with dirt substrates.6 Experience at the Zurich Zoo demonstrated that fecal consistency improved markedly after the introduction of the indigestible ingredients to the diet. However, the same effect might be expected if a food rich in fiber is used; cellulose is similarly indigestible for anteaters as chitin.3 In the United States, many institutions have utilized a standardized diet that consists of a mixture of commercial dry foods for leaf eaters and cats, and is prepared mashed in water as gruel.37 More recently, an extruded complete diet (Mazuri Insectivore Diet 5MK8, Purina Mills, St. Louis, Missouri 63166, USA), is used at several institutions (Edwards, pers. comm.). Dry cat food is preferred over dry dog food, as dog food is likely to contain more starchy cereal components that appear unsuitable for anteaters.2 Additionally, cat food is generally supplemented with taurine, an amino acid essential for cats, and anteaters have presumptive taurine requirements.19 Apart from the less-complex preparation, the easier handling of the ingredients, the reduced hygiene risk caused by the absence of minced meat, and the nutritional adequacy, such a mixture also has the advantage of containing no structural components that might lead to tongue tip constrictions, while providing enough indigestible material for proper gastrointestinal function.

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LITERATURE CITED


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