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Remarks on a Case of Deformities in a Female *Varanus pilbarensis*

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Abstract: Deformities in a captive adult female *Varanus pilbarensis* are described, along with potential diagnoses of these conditions.

Introduction

Health problems in captive reptiles and amphibians often stem from failed attempts to recreate in captivity the range of conditions that would naturally be encountered and utilized by species in the wild. Veterinarians often encounter medical challenges resulting from inadequate or inappropriate diets and nutrition, environmental conditions (*i.e.,* temperature, humidity), and lighting (*i.e.*, UVB exposure) as well as many other husbandry-related factors. These can often be avoided with a better understanding of the biological parameters and specific husbandry needs of a species. In the following case report, we report on severe deformities in a captive *Varanus pilbarensis* that are most likely the result of inadequate supportive husbandry. This information can be of value and interest to veterinary clinicians, herpetologists, and reptile keepers working with monitor lizards in captivity.

Case Report

In December 2015, we were contacted by a private reptile keeper that was experiencing health problems with a captive female *V. pilbarensis* in their collection. This individual acquired the specimen from an unknown keeper; therefore, many important details about its previous husbandry, exact age, and other relevant biological information were unknown. Since it was difficult to make an accurate diagnosis about its pathology without this historical information, it was decided to approach this unusual case using radiographic evaluation, biopsy, and cytology.

Upon its arrival in our care, the *V. pilbarensis*, which measured 36 cm in total length and 27 g, was lethargic and had difficulties moving, with significant deformities affecting its motor and nervous systems (Fig 1.). Because of this, it had problems hunting live food; therefore, it was easier for the specimen to capture prey (legless crickets and locusts) in small containers or when offered with tweezers. On several occasions warm water baths were provided, during which the monitor lizard drank greedily. It defecated only once in three weeks of maintenance and excreted large quantities of very dense urates. A few days after being introduced to its

Fig. 1. Deviation of the spine (scoliosis). Paravertebral lumps are also present.

Fig. 2. Ventral view of the left anterior limb. A dense and caseous material is noticed on the tissues.

Fig. 3. Pectoral muscles with chalky material accumulation.

new terrarium, it stopped eating altogether and refused to move.

Physically, the animal's condition was quite deteriorated. It was almost impossible for the lizard to walk on four legs, to the extent where it dragged the anterior part of its body on the ground, propelled by the hind legs. The four limbs lacked uniformity and several hard masses were detectable in the radio-ulnar, tarsal and carpal, femoral, tibial and humeral regions. The appearance of the digits was quite variable, with most showing deformities including amputations and pathological swellings (Fig. 2). In addition, there was a noticeable deformity of the spine, and the tail showed pathological deviations and a loss of muscle mass. On the ventral side of the body and in the ventral regions of the limbs, a bulging area of an off-white solid material was observed (Fig. 3). Dorsal and paravertebral masses distributed along almost the entire spinal column from the last cervical vertebrae to the lumbar area were also observed (Fig. 4). The eyes were a bit sunken and opaque, suggesting a moderate degree of dehydration. In the mouth there were white masses attached to the mucosa of the maxillary and mandibular branches (Fig. 5), and in the pharynx at the level of the parotid region there were some lumps that protruded toward the cavity which were very dense and had a firm adherence to the soft tissue.

A differential diagnosis in this case could be gout, metastatic calcifications, primary or secondary hyperparathyroidism, metabolic bone disease,

Fig. 4. Similar material as shown in Fig. 3 in paravertebral and intercostal muscles.

Fig. 5. Calcification of the pharyngeal and oral tissues.

deposits of calcium hydroxyapatite, renal disease, or a combination of several of these pathologies. In this case, it was impossible to take a blood sample because blood vessels were probably quite collapsed and dehydration resulted in a state of hypotension in the animal. For this reason, we were unable to determine calcium and phosphorus levels in the blood and other chemical parameters to get an accurate diagnosis of renal failure. General radiography was performed to assess the state of the skeleton and the density of the material in the muscles and joints (see Figs 1 & 3). Scoliosis, a loss of bone density in some vertebrae, and fractures in the left tibia and some phalanges were revealed. Pathological tissue densities at various points of the joints and muscle areas of the limbs were also detected.

Despite making all efforts to save the life of this animal with supportive care, it died three weeks after its arrival. Several tissue samples were taken for histopathological analysis, which revealed metastatic calcification of the kidneys, heart and large blood vessels, and other organs. At postmortem examination, the articular and periarticular tissues of the limbs and dorsal muscles contained well-demarcated accumulations of a soft, white, and pasty to chalky material. The absence of uric acid crystals and tophi in tissues suggests that this case is not related to gout, which can be common in captive monitor lizards (Garner, 2008; Hartdegen, 2002; Köhler, 1992; Mendyk *et al*., 2013). It is presumed that excessive dietary calcium supplementation, chronic dehydration and possibly the excessive use of vitamin D3 supplements were the main cause for death in this specimen.

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