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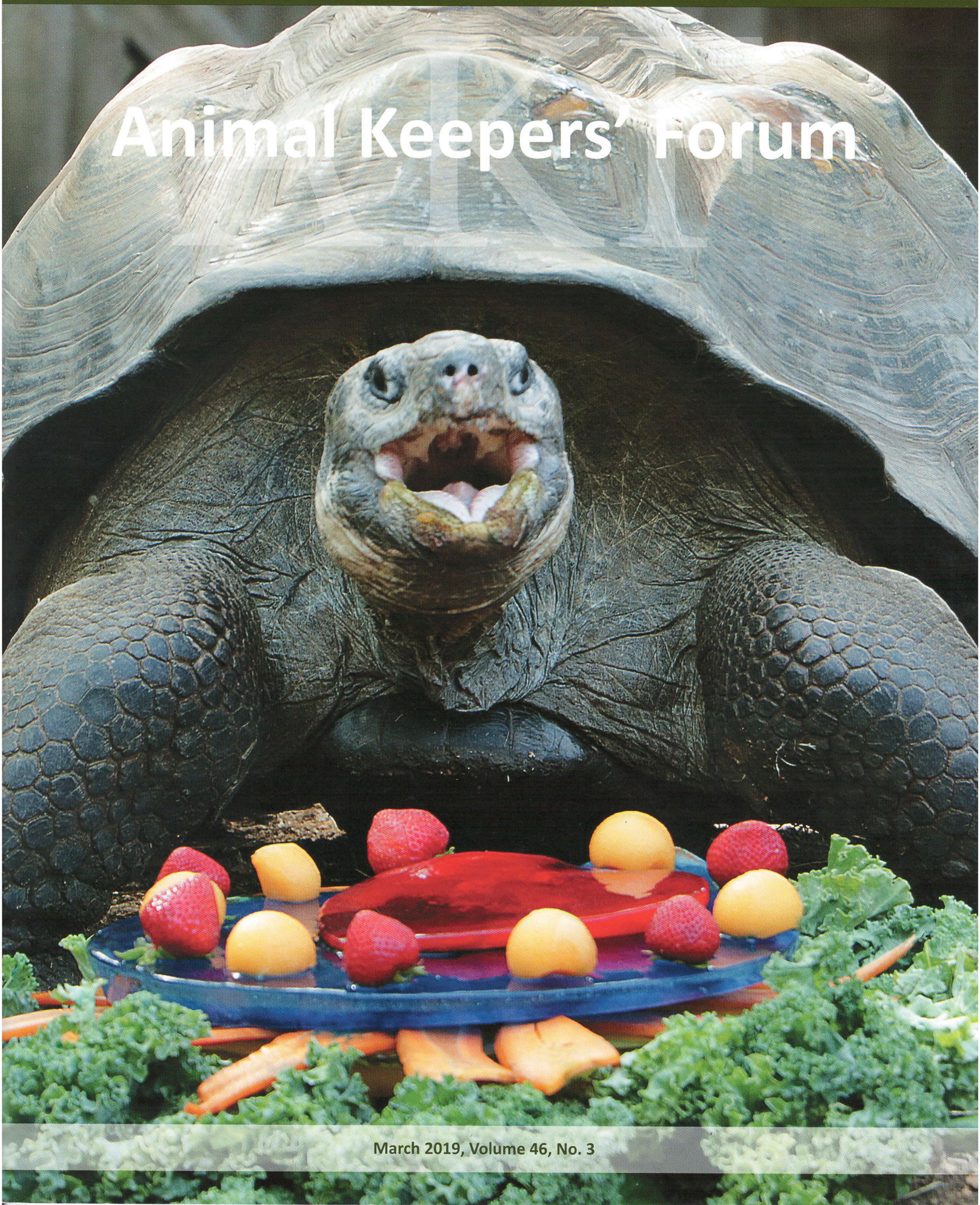

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Subcuticular Paravertebral Calcinosis Circumscripta in the Neck of a Captive African Spurred Tortoise (*Geochelone sulcata*)

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Figure 1 (A). Firm and mobile, subcuticular mass along the dorsal midline at the base of the neck.

Introduction

Calcinosis circumscripta is a well-recognised condition in domestic mammals and is most common in dogs and horses (Gross and Ihrke, 1992). It is comparably rare in reptiles with most reports being limited to aquatic turtles and a few lizard species (Burns et al., 2013; Chambers et al., 2009; Wenker et al., 1999; Frye and Dutra, 1976). This current report describes the diagnosis of Calcinosis circumscripta in a captive mature land-dwelling chelonid and adds to the limited knowledge on this distinct entity in reptile species.

Case Presentation

An ~15-year-old captive male African spurred (Sulcata) tortoise (*Geochelone sulcata*) initially presented with a focal, 2.5 cm diameter, firm and mobile, subcuticular mass along the dorsal midline of the base of the neck (Figure 1A). The mass was monitored over a six-month period and following progressive enlargement was surgically excised for further diagnostic evaluation.

Upon receipt the mass was ~6.1 cm in diameter, contained a thick outer fibrous capsule, and on cut section was

Figure 1 (B). Excised multiloculated cervical mass with abundant amounts of soft pasty to gritty, pale yellow debris dissected by thick bands of fibrous connective tissue.

multiloculated with abundant amounts of soft pasty to gritty, pale yellow debris dissected by thick bands of fibrous connective tissue (Figure 1B). A sterile swab was taken from the bisected mass and submitted for bacterial and fungal culture. The remaining mass was "bread loafed" and distributed into three histocassettes, fixed in 10% buffered formalin and routinely processed into paraffin blocks.

Histologically the mass was composed of multiple varisized nodular accumulations of deeply basophilic, granular to amorphous non-birefringent mineral lakes that were dissected by intervening bands of fibrous connective tissue (Fig 2A and 2B). Foci contained variable numbers of peripheral macrophages and heterophils with rare multinucleated giant cells (Fig 2C), rare heterophils, few peripheral clusters of lymphocytes and scattered foci of osseous metaplasia (Fig 2B and 2C). Mineral content was confirmed with PAS and Von Kossa stains (Fig 2D and 2E).

Based on the characteristic histological features and negative bacterial and fungal cultures, a final diagnosis of calcinosis circumscripta was made.

Discussion

Calcinosis circumscripta (tumoral calcinosis) is characterized as tumor-like deep dermal and subcutaneous nodules that are composed of lakes of deposited calcium salts with an associated chronic granulomatous inflammatory reaction (Gross and Ihrke, 1992). This condition is a well-recognised entity affecting various mammalian species including dogs, horses, cats, and naked mole rats and has also been described in man. In dogs it typically affects young (< 2 years) rapidly growing large breed dogs. It is far less common in reptile species where this condition is often synonymously termed hydroxyapatite deposition disease (HADD), and false gout/pseudo-gout (articular and periarticular calcium pyrophosphate crystal deposition disease) (Burns et al., 2013). Reported affected reptile species

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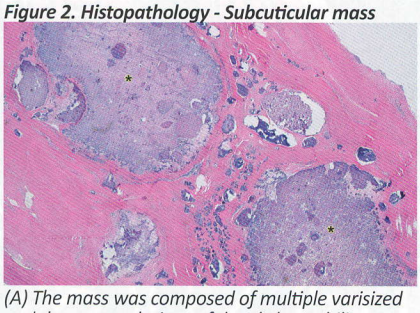
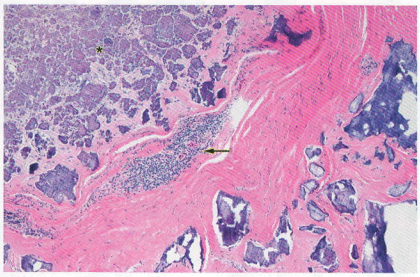
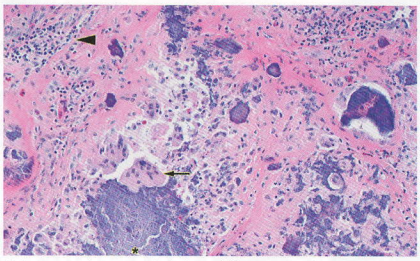
Figure 2. Histopathology - Subcuticular mass



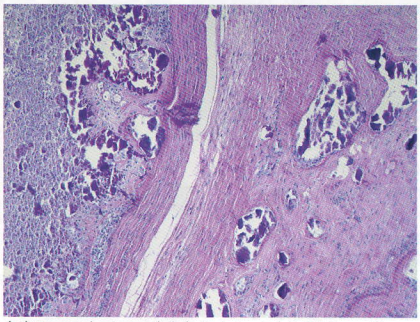
(A) The mass was composed of multiple varisized nodular accumulations of deeply basophilic, granular to amorphous non-birefringent mineral lakes (*) that were dissected by intervening bands of fibrous connective tissue. 2 x H&E.



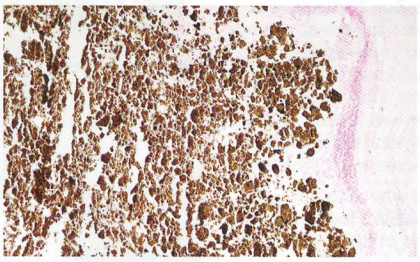
(B) Mineral lakes (*) were surrounded by variable numbers of peripheral macrophages and heterophils with occasional peripheral lymphoid pseudo-follicles formation (arrow). 4 x H&E.



(C) Central mineral debris (*) surrounded by rare ultinucleated giant cells (arrows) and loose accumulations of peripheral lymphocytes and plasma cells (arrow head). 20 x H&E.



(D) Central mineral debris is variably PAS positive. 10 x PAS strain.



(E) Central mineral debris is strongly Von Kossa positive. 10 x Von Kossa stain.

include Uromastyx lizards (Cooper and Jackson, 1981), and a variety of aquatic chelonian species (Burns et al., 2013; Chambers et al., 2009; Wenker et al., 1999; Frye and Dutra, 1976).

Although idiopathic in some cases, it is thought to arise as a form of dystrophic mineralization, often occurring at sites of previous trauma (e.g. bite wounds, ear crops, choke collars, subcutaneous injection sites, abscesses) and at sites of chronic sustained pressure (e.g. subcutis overlying bony prominences, footpad, paravertebral soft tissue, tongue). In humans it has been associated with autosomal recessive inheritance with hyperphosphatemia and/or hypervitaminosis D. A similar genetic predisposition might also exist in reptiles as some reports affected multiple related individuals (Burns et al., 2013).

Although a historic abscess was considered in this case, careful review of this tortoise's life history revealed a thermal burn wound at the same site almost 10 years prior. Soft tissue trauma and dystrophic mineralisation therefore also represents a likely common cause for this condition in reptiles.

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