

Occurrence of myxoma in a bearded dragon (*Pogona vitticeps*): Surgical and histopathological studies

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Abstract

Myxoma is a benign mesenchymal tumor of skin and soft connective tissues considered to be of fibroblastic origin. A female bearded dragon (*Pogona vitticeps*) with a raised mass on the left side of the body was referred to the Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran. The mass had become evident and grew more extensive within the previous 11-month period. The dragon was anesthetized with 5.00% isoflurane, and the mass was removed surgically. Tissue samples of the mass were fixed in 10.00% neutral buffered formalin, sectioned and stained with Hematoxylin and Eosin (H&E), Alcian blue (pH: 2.50), and periodic acid Schiff (PAS) staining techniques. The patient was administered meloxicam, lincomycin, and marbofloxacin. Histopathologically, the capsulated mass was composed of myxoid structure. Stellate-to-reticular cells distributed in a mucinous stroma containing few tiny blood vessels were seen. Myxoid cells displayed a PAS-positive cytoplasm. The myxomatous matrix was alcianophilic at the pH of 2.50. To our knowledge, this is the first report of surgery, treatment, and histopathological study of myxoma in a bearded dragon (*P. vitticeps*). The sutures were also removed 12 days after the operation. No new growth of the mass was observed three months following the surgical procedures.

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Introduction

Myxoma is a benign mesenchymal tumor of skin and soft connective tissues considered to be of fibroblastic origin.¹ This tumor is characterized by an abundant myxoid matrix, affluent in acid mucopolysaccharides, produced by a stellate population to spindle-shaped cells. Myxomas are rare in domestic animals¹ and have been reported in cats,² dogs,³ cattle,⁴ and horses.⁵ In reptile, myxoma has been reported in a Texas indigo snake (*Drymarchon melanurus erebennus*) previously.⁶

Case Description

A female bearded dragon (*Pogona vitticeps*) with a raised mass on the left side of the body was referred to the Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran (Fig. 1A). Based on owner information, the dragon was 3-year-old, and within the previous 11-month period, the mass had become evident and grew larger. On

gross examination, the bearded dragon's total length was measured 22.00 cm. The patient had a bodyweight of 54.00 g and was considered thin. On presentation, no other physical abnormalities were seen, and the lizard was quiet and alert. Finally, tumor resection was selected, and the lizard was anesthetized with 5.00% isoflurane and maintained with 1.00 - 2.00% isoflurane (Baxter, Deerfield, USA). A skin incision was made, and blunt dissection was performed to separate the mass. The mass was removed for histopathological evaluation, and the incision was sutured by a simple interrupted suture pattern. The bearded dragon was recovered uneventfully (Fig. 1B). The mass was white to yellow and approximately 4.00 × 5.00 × 7.00 mm in size. The cut surface was soft and gelatinous in consistency. Tissue samples of the mass were fixed in 10.00% neutral buffered formalin, routinely processed, dehydrated, embedded in paraffin wax, sectioned at 5.00 μm in thickness (Rotary Microtome RM2 145; Leica, Wetzlar, Germany) and stained with Hematoxylin and Eosin. The sections were also stained

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with Alcian blue (pH: 2.50) and periodic acid Schiff (PAS) staining techniques. Sections were examined using a light microscope (E600; Nikon, Tokyo, Japan) and representative images were taken. The patient was administered meloxicam (Rooyan Darou, Semnan, Iran; 0.20 mg kg⁻¹, IM, SID for 4 days), lincomycin (Nasr, Fariman, Iran; 5.00 mg kg⁻¹, IM, SID for 3 days) and marbofloxacin (Rooyan Darou; 10.00 mg kg⁻¹, IM, SID for 3 days). Histopathologically, the capsulated mass was composed of myxoid structure. Stellate-to-reticular cells distributed in a mucinous stroma containing few tiny blood vessels were seen (Fig. 2A). Lobules of neoplastic tissue were separated by thin fibrous septa. No pleomorphism, mitotic figures, atypia, necrosis or multinucleated cells were detected. Myxoid cells displayed a PAS positive cytoplasm and round to oval nuclei and the stroma was stained pale positive with PAS, indicating the presence of glycosaminoglycan in the myxoid mass (Fig. 2B). The myxomatous matrix was alcianophilic at the pH of 2.50 (Fig. 3). Histopathological findings supported a diagnosis of myxoma. The sutures were removed 12 days after operation. Based on owner information, no new



Fig. 1. A) Lateral view of subcutaneous myxoma (arrowhead) in a 3-year-old bearded dragon; **B)** Bearded dragon after the surgery of mass, Scale bar = 1.00 cm.

growth of the mass was observed three months following the surgical procedures.

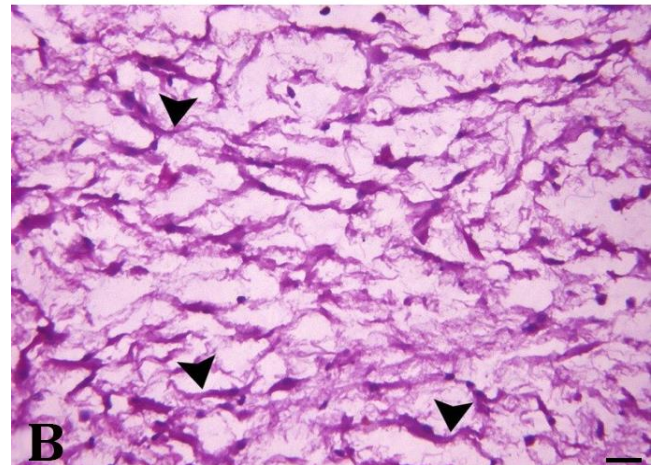
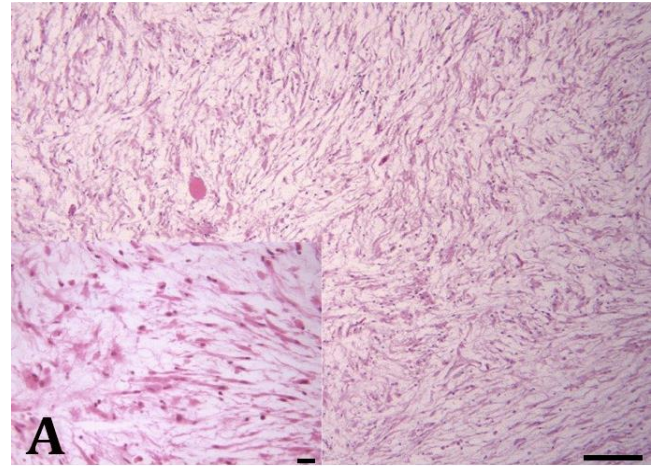


Fig. 2. A) Hypocellular mass with spindle-shaped and stellate cells scattered within a mucopolysaccharide myxoid matrix (H&E, Scale bar = 100 μ m). Inset: High magnification of spindle-shaped cells in a myxoid matrix (H&E, Scale bar = 20.00 μ m), **B)** Myxoid cells display a periodic acid Schiff positive cytoplasm (arrowheads), (PAS, Scale bar = 20.00 μ m).

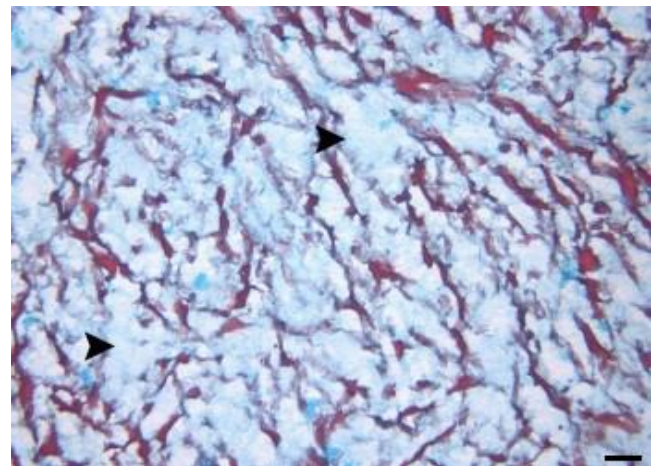


Fig. 3. The intercellular myxoid matrix (arrowheads) is alcianophilic at the pH of 2.50 (Alcian blue, Scale bar = 20.00 μ m).

Discussion

Neoplasms are rarely reported in bearded dragons; therefore, little is known about these disease conditions. Reports concerning to bearded dragons have described malignant peripheral nerve sheath tumor,⁷ squamous cell carcinoma,⁸ benign iridophoroma,⁹ periorbital adenocarcinoma¹⁰ and periocular myxosarcoma.¹¹ There are also reports regarding the incidence of neoplasia in reptiles. In a former study, the pathology records of all lizards received by one institution (Northwest ZooPath, Washington, USA) have been reviewed. From November of 1994 until March of 2002, the prevalence of neoplasia in lizards submitted to this institution has been recorded 6.00%. Neoplasms in lizards examined in this paper, have been raised most often from the hematopoietic system (0.20%), musculoskeletal system (0.17%), hepatic system (0.10%) and skin (0.10%).¹² Cutaneous and subcutaneous soft tissue tumors in lizard are rarely reported and snakes are generally thought to be affected most frequently.¹³ Myxomas are benign neoplasms of fibroblasts producing a myxomatous matrix.¹ In veterinary medicine, cardiac myxoma has been reported in a cat² as multilobulated and polypoid tumors. Also, these tumors have been reported in various organs or tissues such as joint of dog,³ limbs of cattle⁴ and skin of horse.⁵ In the present case, subcutaneous myxoma was diagnosed. Microscopically, myxomas have low cellularity and no mitotic figures; however, increases in cellular density and mitoses warrant the diagnosis of myxosarcoma.¹ No hypercellularity and mitoses were identified in this case. The gross and histopathological findings in this case are consistent with the results of previously reported subcutaneous myxomas in kelp gulls (*Larus dominicanus*),¹⁴ where the myxoid matrix was stained with Alcian blue and the presence of abundant acid mucopolysaccharides in the myxoid matrix was confirmed. Most of neoplasms in reptiles behave in a manner similar to the mammalian or avian counterparts; therefore, biological behavior and prognosis of these neoplasms could be estimated in this regard.¹² Myxomas are generally considered to be spontaneous and self-limiting. Therefore, surgical excision is the treatment of choice for focal masses (especially myxoma).¹² In the present case, surgery was also performed successfully and no new growth of the mass was observed three months following the surgical procedures. The etiology of myxomas is unknown. In mammals, they have been linked to local trauma, vaccines, foreign bodies, parasites and other causes.¹⁵

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Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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