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### Clinical Report

## Telangiectatic Osteosarcoma in a Budgerigar (*Melopsittacus undulatus*) - Pathological Findings

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#### Keywords:

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#### Abstract

**Background-** Neoplastic diseases are one of the main factors that threaten the life span of pet birds. Osteoma and osteosarcoma are considered as the most prevalent of neoplasms in the skeletal system, which were reported in several species of the birds.

**Case Description-** This paper describes gross and histopathological features of telangiectatic osteosarcoma in an adult male budgerigar (*Melopsittacus undulatus*) with weakness, general depression and weight loss.

**Clinical Findings-** At necropsy, a firm mass with approximately one cm in size and brown color involved the tibiotarsus. Pathology examination of the mass indicated bloody cystic lesions accompanied by occasional spicules of osteoid between pleomorphic mesenchymal cells, which it was found minimal.

**Clinical Relevance-** Telangiectatic osteosarcoma should be differentiated from either hemangiosarcoma or aneurysmal bone cyst. This is the first report of osteosarcoma in the budgerigar.

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## 1. Introduction

Osteosarcomas are distinguished by the overproduction of osteoid or immature bone by malignant osteoblasts, which can differ in the amount and quality of the matrix between and within tumors. In birds, histologically osteosarcomas are consisted of fusiform or stellate-shaped cells forming bundles and sheets.<sup>1</sup> The variation in histological feature and matrix production is considered by attempts to subclassify osteosarcomas into various forms, consisting of fibroblastic, chondroblastic, and osteoblastic types. Classification of central osteosarcoma as telangiectatic is presented, however, of relevance as this tumor tend to be more aggressive in mammalians,<sup>2,3</sup> which is associated with a less favorable prognosis than all other subtypes of osteosarcoma.<sup>4</sup> Of note, it should be characterized by either hemangiosarcoma or aneurysmal bone cyst.<sup>3</sup>

Budgerigars, which vary in size and feather coloration, are one of the popular and likable captive pet birds, which occasionally have close contact with its owner. Among the birds, it was believed that there is a significantly higher incidence of neoplasia in captive birds due to increased life span, and also higher exposure to carcinogens.<sup>5</sup>

Previously, osteoma in the birds have been detected in the feet of a duck,<sup>6</sup> affecting different anatomical sites in a few chickens,<sup>7</sup> and in the cranium of a budgerigar.<sup>8</sup> It has been previously described that osteoblastic osteosarcoma involved the humerus of a dove, the coccyx of a gang-gang cockatoo, the tarsometatarsus of a sulphur-crested cockatoo, and the tibiotarsus of a Japanese quail.<sup>8</sup> To the best of the author's knowledge, this is the first report of the telangiectatic osteosarcoma in the budgerigar.

## 2. Case Description

In March 2018, an adult male budgerigar was presented to the University of Tabriz Veterinary Hospital (Iran) with anorexia and weight loose. Indeed, two budgerigars had been bought four months prior from a pet shop where the birds had close contact with different pet birds. It was kept

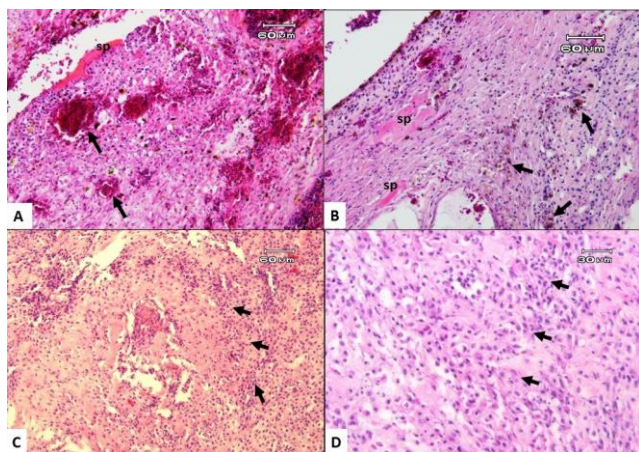
as pet birds in the owner's home and was fed with different seeds, mainly flaxseed and millet. Other recorded clinical signs comprised generalized depression, weakness, anorexia, and incoordination. Of note, in gross observation, a large palpable mass involved the medial surface of left tibiotarsus of the affected bird. Firstly, the decision was made to explore and remove it surgically. Sadly, the bird died before the surgery, and a necropsy was performed. At necropsy, the mass was firm and approximately 1 × 0.8 × 0.8 cm in size with brown color and several small red foci. The mass was processed for histologic evaluation, which fixed in 10% neutral buffered formalin, processed routinely, and embedded in paraffin wax. Sections (5 µm) were stained by hematoxylin and eosin (H&E) and studied microscopically.

## 3. Results and Discussion

Pathologic examination of the mass indicated bloody cystic lesions accompanied by occasional spicules of osteoid between pleomorphic mesenchymal cells associated with severe hemorrhage and hemosiderin accumulation (intracellularly and extracellularly) (Figure 1).

It should be differentiated from either hemangiosarcoma or aneurysmal bone cyst. However, osteosarcoma is considered as a rate of avian tumors.<sup>1</sup> It can be made from hemangiosarcoma by the presence of characteristic spicules of osteoid among malignant mesenchymal cells; however osteoid production frequently is minimal, which was observed in the present study. The septa separating the many blood-filled spaces present throughout the tumor lines by malignant cells that can help to differentiate from malignant endothelial cells, which it was not found in the present case.<sup>3</sup> Moreover, the destruction of local structures in the cortex of the affected bone is another distinguishable feature of telangiectatic osteosarcoma.<sup>3</sup> In the present case, the tumor involved the tibiotarsus of the bird, which limited his movement. In this regard, it was previously reported that several osteosarcomas involved long bones, ribs, and vertebrae of young chickens.<sup>7</sup> Growing evidence

suggests osteosarcomas are frequently identified on the wings and legs and less commonly on the axial skeleton.<sup>1</sup> Also, it has been independently detected in the skull and eye.<sup>1</sup> It is believed that osteosarcomas of birds rarely metastasize.<sup>1</sup> Here, poor prognosis was observed in the affected budgerigar. As previously described, telangiectatic osteosarcoma presented more aggressive behavior and a less favorable prognosis rather than other subtypes of osteosarcoma in both human patients and animal species.<sup>2-4</sup> Considering the current findings, it seems that it can be shown a weak prognosis in the birds as well as mammals. Taken to gather, the present findings concluded that telangiectatic osteosarcoma could involve the birds, which shows an aggressive manner associated with a poor prognosis.



**Figure 1.** Telangiectatic osteosarcoma, the budgerigar. A: The bloody cystic lesions (arrows) are found which accompanied with minimal spicule of osteoid (sp). B: neoplastic cells are observed associated with the minimal spicule of osteoid (sp) and the extracellular and intracellular hemosiderin deposits (arrows). C and D: a large numbers of pleomorphic osteoblasts (arrows) is shown. H&E.

## Conflict of Interests

None

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