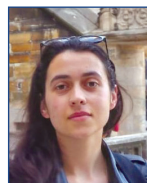


Interclavicular air sac fibrosarcoma in a Carolina Duck (*Aix sponsa*, Linnaeus 1758)



Andrea Garcês*, Nuno Álvura and Isabel Pires

Abstract

The Carolina duck (*Aix sponsa*, Linnaeus 1758) is an Anatidae species originating from North America. Several types of neoplasms have been reported in this species. The aetiology is undefined and spontaneous tumours are rare within this species.

The authors present an unusual case of spontaneous fibrosarcoma occurring in an interclavicular air sac in an adult female *Aix sponsa*.

Key words: *Aix sponsa*; Carolina duck; air sac; fibrosarcoma; malignant

Introduction

The Carolina duck (*Aix sponsa*, Linnaeus 1758) is an Anatidae species originating from North America. In Europe, this species has been introduced as an ornamental garden animal and nowadays, it is very common in public and private gardens (International, 2016).

Fibrosarcomas are malignant mesenchymatous neoplasms described in different bird species, particularly in psittacine (Riddel and Cribb, 1983; Sutherland et al., 2016; Siqueira et al., 2018). They arise in a wide variety of organs, most frequently in the oral cavity, abdomen and bones (Loukopoulos et al., 2014; Sigfried, 2018). Within the

respiratory tract, fibrosarcomas can occur in the air sacs, syrinx, and lungs (Azmanis et al., 2013). They tend to be locally invasive with a high potential for recurrence, but rarely metastasize (Rigdon, 1961; Azmanis et al., 2013).

In Anatidae, only a few cases of fibrosarcoma have been reported. Some examples are left tarsus and surface of the metatarsal-digital articulation fibrosarcoma in a mute swan (*Cyganus olor*), fibrosarcoma around the wrist joint in an American wigeon (*Mareca americana*), humerus fibrosarcoma with metastases to the lung in spur-winged goose (*Plectropterus gambensis*), muscular

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fibrosarcoma in the pectoral muscle with renal metastases in a domestic goose (*Anser domesticus*), and abdominal cavity fibrosarcoma in a Peking duck (*Anas platyrhynchos domesticus*) (Rigdon, 1972).

However, to the extent of our knowledge, no cases have been reported in the Carolina duck. This report presents an unusual case of spontaneous fibrosarcoma arising in an interclavicular air sac in a Carolina duck.

Description of the case

An adult female *A. sponsa* was found dead in the garden of the Maia Zoo (Maia Portugal), without any previous signs of sickness. The *post-mortem* examination was performed according to the techniques described for birds. (Garcés and Pires, 2020).

The animal was thin, its body condition was assessed as three of the maximum ten grades. A spherical mass with 3 cm in diameter was observed on the right side at the opening of the celomic cavity, next to the trachea, cranial to the heart and behind the great vessels, anatomically related to the interclavicular air sac (Fig 1A). At the cut the surface of the mass was grey/white and shiny, with a fasciculate pattern (Fig 1B, 1C). The liver was congested, and lumina from the oesophagus and proventriculus had a whitish mucoid substance. Both kidneys were pale and contained a white powdery needle-like crystalline

substance compatible with urate crystals. No additional gross lesions were observed.

Tissue specimens were collected, fixed in neutral buffered 10% formalin, paraffin-embedded and 3 µm cuts were stained with hematoxylin-eosin (H&E), and Van Gieson's stain. A proliferation of spindle shaped cells arranged in an interwoven pattern, with moderate cytonuclear atypia was observed. Neoplastic cells presented scant cytoplasm, and elongate to oval nuclei with inconspicuous nucleoli and occasional mitotic figures (Fig 2). Cytonuclear atypia was generally moderate, however cellular aberrations were observed. Van Gieson's staining confirmed the presence of collagen and helped to define the final diagnosis as a fibrosarcoma (Fig 3). Other microscopic findings include the presence of hepatic congestion and kidney visceral gout.

Discussion

Here we present a spontaneous fibrosarcoma occurring in interclavicular air sac in a Carolina duck (*Aix sponsa*). Several induced tumours associated with chemical carcinogens, aflatoxins and viruses have been reported within *Anatidae* species. Nevertheless, spontaneous tumours are not common. Its aetiology is undefined, but some authors have suggested nutritional deficiencies (vitamins), toxics, stress or weak immune system as the cause (Rigdon and Leibovitz, 1970;



Figure 1. A, B - Spherical mass 3 cm in diameter found next to the crop, cranial to the heart and behind the great vessels; C - Mass at cut with a white and firm tissue, with a fasciculate disposition in a Carolina duck (*Aix sponsa*, Linnaeus 1758) - Fibrosarcoma

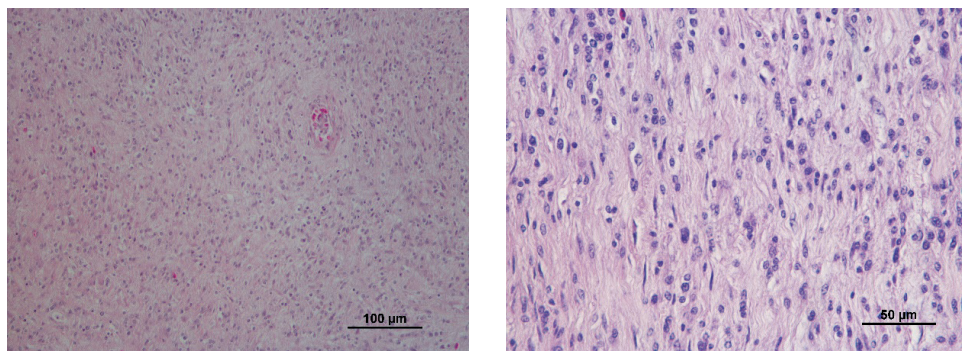


Figure 2. Proliferation of spindle shaped cells arranged in an interwoven pattern. – Fibrosarcoma (*Aix sponsa*, Linnaeus 1758). H&E stain (bar =100 and 50 µm)

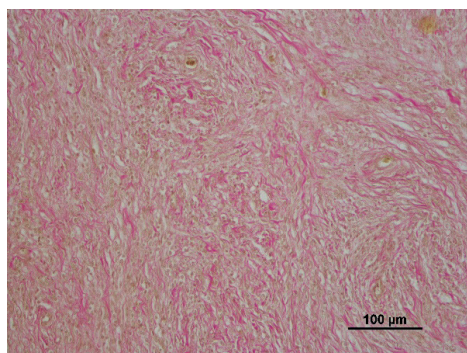


Figure 3. Fibrosarcoma (*Aix sponsa*, Linnaeus 1758). Van Gieson's stain (bar =100 µm)

Reece, 1992; Sigfried, 2018). In our case, it is only possible to speculate as to a possible cause of the tumour since no previous evidence of disease was detected.

Treatment of fibrosarcoma in birds may be effective through surgical excision and chemotherapy/radiotherapy (Rigdon, 1972; Sutherland et al., 2016). However, the lack of specific clinical signs results in a delayed diagnosis and makes treatment impossible. Indeed, the tumour often remains undetected until the *post-mortem* examination, as in the case described here. As expected, no metastases were observed and the death of the animal was likely due not to the cancer itself but to its size and location (near the large vessels and lungs).

Conclusion

Single cases of tumours in *Anatidae* have been described. However, prevalence surveys, essential for understanding their aetiology and defining risk factors, are very rare. On the other hand, cancer must be seen in a One Health context. Cancer arising in wild and exotic animals can have a great impact and significance on the environment-human-animal triad. An One Health approach to neoplasia is the basis for comparative oncology and enables taking a different view of cancer as a possible ecosystem disease.

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Fibrosarkom interklavikularne alveole američke mandarinke (*Aix sponsa*, Linnaeus 1758.)

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Američka mandarinka (*Aix sponsa*, Linnaeus 1758.) je vrsta patke podrijetlom iz Sjeverne Amerike. U ove vrste prijavljeno je nekoliko tipova neoplazija. Etiologija nije definirana, a spontani tumori su rijetki kod

ove vrste. Autori predstavljaju neobičan slučaj spontanog fibrosarkoma u interklavikularnoj alveoli odrasle ženke *Aix sponsa*.

Ključne riječi: *Aix sponsa*, američka mandarinka, alveola, fibrosarkom, maligno