Vaccine-associated fibrosarcoma in a lion (Panthera leo)

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SUMMARY

The clinical signs, histopathology and necropsy findings of a case of a vaccine-associated fibrosarcoma in a lion from Dubai are described.

Keywords : fibrosarcoma, vaccine, lion, Dubai

RÉSUMÉ

Fibrosarcome vaccinal chez un lion (Panthera leo).

Ce cas clinique décrit les symptômes et les anomalies histopathologiques et nécropsiques observés chez un lion (Panthera leo) du zoo de Dubai présentant un fibrosarcome vaccinal.

Mots-clés : fibrosarcome, vaccin, lion, Dubai

Introduction

In the domestic cat, fibrosarcoma has been recently associated with the use of vaccines and the development of these tumours appears to occur at the site of injection in 0.006% of vaccinated cats [2]. Once diagnosed, the prognosis remains guarded to poor and even with repeated surgeries and/or radiation therapy, the median tumour free period is 3 to 9 months and the median overall survival time is 19.2 months [3]. It is assumed that this cancer may affect all feline species. However, there are no records in Felidae other than cats [1-3] and tigers [4]. The aim of this short communication is to report a vaccine-associated fibrosarcoma observed in a lion.

Clinic case

An eight-month old female captive lion (Panthera leo) was visited in February 2006 because of a hard large mass growing in the subcutaneous tissues of the inter-scapular region. The mass was firm and attached to the underlying tissues, surrounded by abundant haematic exudate.

No collateral signs were noticed. The results of haematology and biochemistry were unremarkable. The haematic exudate was found to be bacteriologically sterile.

The lion had been vaccinated two months earlier against rabies, feline leukemia and feline rhinovirus. Clinical diagnosis of vaccine-associated fibrosarcoma was done and the owner was made aware that the prognosis of these cases is guarded to poor. The tumour was carefully removed and histopathology confirmed a well differentiated, intermediate grade fibrosarcoma with dermal proliferation of plump spindle cells arranged in interwoven bundles and mild mononuclear infiltration.

Such tumors are usually treated with surgery and radiation therapy. However, fibrosarcoma is an aggressive cancer with guarded to poor prognosis and no single treatment regimen has been found effective in its control [1]. This assumption motivated the euthanasia of the patient on humanitarian grounds, also considering the difficulties associated with its handling.

Necropsy of the female lion (28 kg) revealed greyish firm subcutaneous mass (80x40x15 mm) at the caudal neck attached to the skull.

Beside this lot of plastic and towel pieces were found in the stomach and numerous round worms in the intestine, which were identified as Toxascaris leonina. Alpha-toxin producing Clostridium perfringens was isolated from the intestine, while other organs were sterile.

Histopathology confirmed the same intermediate grade fibrosarcoma revealed by the biopsy. Some peripheral macrophages contained gray/brown intracytoplasmatic material, typical for vaccine adjuvance based on aluminium [6]. No metastasis was found in the regional lymph nodes or in other organs.

Discussion

This is presumably the first record of a feline vaccine-associated fibrosarcoma in a lion. To the authors’ knowledge, vaccination has not previously been reported to be oncogenic in any species other than cats [1-3], tigers [4] and ferrets [8].

It has been suggested that the adjuvant present in vaccines against rabies virus or feline leukaemia virus (FeLV) may
produce inflammation, stimulate fibroblasts to divide and induce free radical formation that results in oxidative damage to DNA, leading to the possible development of sarcoma [7]. In the present case, the association with the use of adjuvant-containing vaccines seems to be confirmed by the record in the vaccination booklet and by the recovery of macrophages containing intracytoplasmatic adjuvant looking-like material [6].

However, it is now acknowledged that anything that induces an inflammatory response may be associated with such tumors, including other medications, microchips and even lack of an injection [5].

Non-injection site sarcomas are increasingly reported [9] as well as variations in the tumor suppressor gene in some cats, which may explain a possible individual susceptibility to sarcoma development [7].

The sensitivity of felines to oxidative injury is believed to be one reason for their high vaccine-associated tumor rate [7]. The more often a feline is vaccinated and the higher is the risk of vaccine-associated sarcomas [9]. Preventive regulations therefore should include avoidance of over-vaccinating or of using any medication that produces chronic inflammation and, when possible, limiting the use of vaccines containing adjuvant [7]. Vaccine-associated sarcomas result in an uncomfortable situation for most veterinarians, because this disease is likely induced and it is usually associated with a poor to guarded prognosis [9]. Tissue biopsy is essential for a correct diagnosis that can provide a prognosis and direct therapy.

Current guidelines recommend that any lump at a vaccination site should be submitted to biopsy and removed if it meets any of the following criteria: 1) present 3 months after vaccination; 2) greater than 2 cm. at any time after vaccination; 3) growing in size 4 weeks after vaccination [7].

The sarcoma observed in this lion met the first 2 criteria and therefore had to be removed. Unfortunately a growing lion is difficult to handle with in absence of sedation and radiation therapy was not available locally. With surgery alone, the recurrence rate is 60%, with 86% of tumors recurring within 6 months [7]. A combination of radiation therapy, followed by surgery and chemotherapy usually gives the best results and it is currently highly indicated [9].

References


