

CASE REPORT

Orbital extraskeletal osteosarcoma following enucleation in a cat: a case report

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Abstract

Objective We present a unique case of a feline orbital extraskeletal osteosarcoma that developed 5 years post-enucleation.

History In 2002, an ophthalmologist enucleated the left eye of a 2-year-old neutered male DSH and submitted it to the Comparative Ocular Pathology Laboratory of Wisconsin (COPLOW). COPLOW diagnosed the left eye with feline diffuse iris melanoma. In June 2007, the cat presented to another veterinarian for moderate swelling of the enucleation site. Palpation suggested a firm mass along the lateral orbital rim and an exploratory orbitotomy revealed a cyst with a mass adhered to it and the ventrolateral orbital rim. The cyst and mass were excised by the veterinarian and submitted to COPLOW. COPLOW diagnosed the tissue as an orbital conjunctival inclusion cyst and an acquired orbital osteosarcoma.

Conclusions Following the enucleation, retained conjunctival epithelium became embedded in the connective tissue of the orbit and caused a cyst to develop. The cyst wall consisted of a myofibroblastic collagen-rich matrix and acted as a nidus of chronic irritation and tumor growth. This orbital osteosarcoma resembles feline vaccine-associated sarcomas (VAS), feline post-traumatic ocular sarcomas, and microchip-associated sarcomas in terms of its histopathology and its hypothesized pathogenesis related to exposure to antigenic material such as implanted epithelium, lens protein, vaccine components, and microchips as foreign bodies.

Key Words: conjunctival cyst, enucleation, feline, orbital, sarcoma

INTRODUCTION

Post-traumatic ocular sarcomas, first recognized in 1983, are more prevalent in cats than any other species.^{1–3} These ocular sarcomas, also called feline ocular sarcomas, are primarily associated with previous trauma to the eye, which includes lens rupture. Chronic inflammation is also a risk factor for developing a primary ocular sarcoma. Evidence suggests that post-traumatic ocular sarcomas arise from the proliferation of metaplastic lens epithelial cells. They can take months or years to become clinically evident.⁴

Vaccine-associated sarcomas (VAS), recognized in 1991, are also more prevalent in cats.^{5,6} Studies show that VASs are associated with the inflammatory reaction initiated by the injection itself, the adjuvant, and/or other vaccine components as well as a possible genetic predisposition. In addition, researchers hypothesize roles for several cytokine

molecules including: TGF- α , granulocytic-macrophage colony-stimulating factor, fibroblast growth factors, and P53 proteins.^{5–11} It is unclear how long these tumors take to develop, as most cats receive multiple vaccines throughout their lives, but the average age of first occurrence of a VAS is 10.3 years.⁵

Soft tissue sarcomas have also been associated with implanted subcutaneous microchips in several species, including a cat.^{12–16} The average time between microchip implantation and appearance of a sarcoma ranges from almost 1 to 3 years depending on the species. Elcock *et al.*¹³ hypothesize that the pathogenesis of microchip-associated sarcomas involves the inflammatory response as well as fibrotic encapsulation of the microchip.

Most of the research into feline sarcomas has focused on the idea that there is something unique about the feline inflammatory response, making cats more susceptible to the