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Review Article

A Case Report of Second Stage Digital Fibrosarcoma in a 3 Years Old Domestic Shorthair Cat

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ABSTRACT

Objective: Sarcomas are neoplasms of mesenchymal (stem cell) origin and are rare skin diseases of cats and may occur anywhere on the cat body. The main etiologies of soft tissue sarcomas are Feline sarcoma virus induced sarcomas, vaccine site sarcomas, trauma, inflammation and radiation. **Methods:** In March 2014, a three years old male domestic shorthair cat were referred to a private veterinary clinic in Tehran, Iran with a tumor-like bump on the plantar surface of his left pelvic limb. As a diagnostic and therapeutic procedure, surgical excision was recommended. **Results:** It seems that, due to the location of the fibrosarcoma in this cat it was a result of a prior wound or foreign body insertion to plantar surface of the affected limb. The development of a sarcoma at a site of previous trauma or inflammation has been documented in animals and people, although rarely.

1. INTRODUCTION

Soft tissue tumors are those that arise from the mesenchymal connective tissues of the body. Tumors of fibrous, adipose, muscular and vascular tissues are included in this definition and by convention it also includes tumours of the peripheral nervous system because tumours arising from nerves present as soft tissue masses and pose similar problems in differential diagnosis and management. Soft tissue tumours are relatively common tumours in both the dog and cat (Morris, 2001). In the cat benign soft tissue tumours are uncommon. The malignant counterparts, soft tissue sarcomas, are important tumours in both the cat and the dog. Collectively they comprise approximately 7% of all feline 'skin' and subcutaneous tumours, but they can arise in other sites, for example oral, nasal and urogenital, hence the actual incidence of soft tissue tumours may be higher than indicated in many studies. The main etiologies of soft tissue sarcomas are Feline

sarcoma virus induced sarcomas, vaccine site sarcomas, trauma, inflammation and radiation (Morris, 2001). Fibrosarcoma tumors are significantly more often located at classical vaccine injection sites on cats associated with FeLV vaccines (Bergman, 1998). The vaccines generally associated with this disease to date have been the adjuvanted rabies and feline leukemia virus vaccines; however, association with non-adjuvanted vaccines has been occasionally reported. More rare forms of spontaneous fibrosarcoma have been described and have been found associated to genetic alterations, such as allelic loss, point mutations and translocations (Myar, 2006 and Santos, 2006). Transition between inflammation or wound healing and tumours has been frequently observed in different animal models of virus- or oncogene-induced tumours, in which inflammatory compounds appear to play a role in carcinogenesis. In cats, early vaccination sites show persistent inflammatory or foreign-body reactions characterized by areas of necrosis, aggregates of lymphocytes and plasma cells, and granulation tissue

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formation. This reaction is thought to predispose fibroblasts or myofibroblasts to proliferate, leading to neoplastic transformation through different mechanisms including activation of oncogenes and inactivation of tumor suppressor genes. On the other hand, agents that promote inflammation such as acidic fibroblast growth factor (FGF-a) and basic FGF (FGF-b) create a favorable environment for expression of oncogenes and subsequent development of tumors (Myar, 1995).

CASE DESCRIPTION

In March 2014, a three years old male domestic shorthair cat was referred to a private veterinary clinic in Tehran, Iran with a tumor-like bump on the plantar surface of his left pelvic limb. The owner mentioned that the lesion has first observed about 1 month ago. In the clinical examination a firm, nodular and pedunculated cutaneous lesion (17×16×22 mm) was seen on the plantar surface of the left pelvic limb between third and fourth digits which were neither painful nor ulcerated (Figure 1). Routine hematological and biochemical blood analysis was normal. As a diagnostic and therapeutic procedure, surgical excision was recommended. Radical excision with one centimeter margins was conducted (due to the location of the tumor, a wider excision was not possible). Immediately, the excised tumor was referred to diagnostic laboratory for hisopathologic evaluation. As a result, the tumor was reported as a second stage fibrosarcoma. According to recommendations for the complete resolution of fibrosarcoma, radiotherapy treatment was recommended for the patient but that was refused by the owner. All chest radiographs are negative for pulmonary metastasis. In follow-up examinations up to 6 month after the surgery (the time of writing the article), there was not seen any recurrence of the tumor on the initial site and the cat was generally healthy.

DISCUSSION

Sarcomas and fibrosarcomas are rare skin diseases of cats and may occur anywhere on the cat body. Although, most of sarcomas are associated with FeLV-vaccine or rabies vaccine injections, whereas the majority is related to prior wounds or inflammations as seen in this case (McLeland, 2013).

Fibrosarcomas need to be differentiated histologically from rhabdomyoma and rhabdomyosarcoma (Kass, 1993). It seems that, due to the location of the fibrosarcoma in this cat it was a result of a prior wound or foreign body insertion to plantar surface of the affected limb. The development of a sarcoma at a site of previous trauma or inflammation has been documented in animals and people, although rarely. Examples of such sites include scar tissue following surgical procedures, thermal or chemical burns, fracture sites and sites in the vicinity of plastic or metallic implants, usually after a latent period of several years (Morris, 2001). Soft tissue

tumours of cats and dogs may be classified according to their tissue of origin.

In some soft tissue sarcoma the component cells are so poorly differentiated that it is difficult to determine the tissue of origin and, in the absence of further cytochemical and immunohistochemical evaluation, such tumours may be described by their morphology, i.e. spindle cell sarcoma, round cell sarcoma, anaplastic sarcoma.

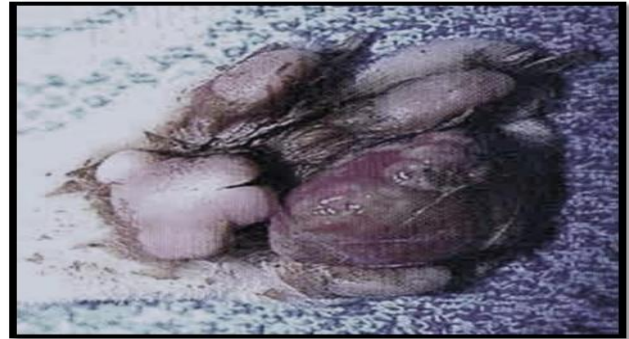


Figure 1. Gross view of the tumor on the plantar surface of the left pelvic limb.

Soft tissue sarcomas enlarge in a centrifugal fashion and compress normal tissue so as to give the appearance of encapsulation. This pseudo-capsule is actually composed of an inner compressed rim of normal tissue (compression zone) and an outer rim of edema and newly formed vessels (reactive zone). Because of this pattern of growth, local tumor recurrence after surgical excision is common. The pseudo-capsule provides a tempting plane for resection however, such a procedure leaves microscopic and even gross tumor in the wound. Excision of any sarcoma within the pseudo-capsule is inadequate therapy and will result in local tumor recurrence (Morris, 2001). As a result, complete excisional extra-capsular surgery was done for this patient to minimize the risk of recurrence of the tumor. Overall it is estimated that metastasis occurs in up to 25% of all soft tissue sarcomas. Whilst there is some variation in the incidence of metastasis between tumours of different histological types, it is now recognized that the risk of metastasis for a particular tumor type correlates with the grade of tumor. Metastasis is usually via the hematological route with blood borne metastases favoring the lung as the predominant site for the development of secondary tumours. There was no metastasis for this patient at the time of first examination and up to 6 month after that.

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