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Case Report

A Giant Squamous Cell Carcinoma in an Andontic Domestic Shorthair Cat

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Abstract

Squamous cell carcinoma (SCC) is one of the most common malignant skin tumors in cats. A two years old male unowned domestic short hair cat was referred by an animal rescue volunteer with the history o severe lesions on the nasal planum, and mucopurulent nasal discharge. In physical examination, ulcers involved the whole nasal planum, eventually leading to loss of the rostral nasal cartilage and central upper lip but gingivostomatitis, and oral ulcer was not detected. Surprisingly anodontia of the permanent teeth was also detected in oral examination. Cytological examination of lesions revealed sparse cocci, many neutrophils and erythrocytes, and paraneoplastic (actinic) changes. Fine-needle aspiration of the submanibular lymph node showed no metastasis. The complete blood cells test (CBC) showed mild leukocytosis and anemia but no abnormality was detected in the biochemical survey. Skull Radiograph showed no evidence of teeth or unerupted teeth from the mandible and maxilla and severe bilateral nasal concha turbinate destruction. In thoracic and abdominal radiographs, there was no sign of metastasis. Biopsy specimens were collected under general anesthesia and revealed an irregularly hyperplastic epidermis, keratinocytes containing large vesicular nucleus and nucleolus with mild Pleomorphism and high mitotic index confirming the occurrence of SCC tumor. Unfortunately, this case was referred with severe destruction in ventral and dorsal nasal concha and cranial ethemotourbinates, facial deformity and osteolysis. Thus the cat was euthanized. Early diagnosis of SCC is paramount for prompt therapeutic intervention, which may result in long-term control or cure for affected patients.

Keywords: Squamous Cell Carcinoma; Cat; Histopathology; Andontia

Introduction

Squamous cell carcinoma (SCC) is one of the most malignant skin tumors in cats, and the origin of this neoplasm is the squamous epithelium [1,6,10]. In SCC, tumor cells show differentiation to keratinocytes [5]. Squamous epithelium cells are usually found in the skin, oral cavity, esophagus, nail beds and foot pads. In cats, SCC usually occurs between 9 to 14 years of age; but it can also occur in young cats [4]. Development of SCC has been associated with several factors, including chronic sun exposure (UV light), areas with a lack of pigmentation, and a thin hair coat at the sites affected with the tumor [5,7]. Geographic location, climate and anatomic location were also greatly influences the incidence of SCC [7]. Recent studies have shown a relationship between papillomaviruses and SCC [7,9], but sex and breed don't affect the tumor outbreak [4]. Cutaneous SCCs are locally invasive and slow to metastasize and subdivided to invasive and multicentric (Bowenoid in-situ carcinoma) (BISC) types in cats. The invasive form metastases slowly and can be cured by complete excision. However, if invasive SCC develops on some tissues like the nose or within the conjunctiva, it will be difficult to fully excise and led to humane euthanasia due to local progression [9]. Various methods have been described to successfully treat cats with squamous cell carcinoma of the nasal planum including radiation therapy, hyperthermia, intratumoural administration of carboplatin, cryosurgery, conservative surgery and photodynamic therapy. However, the treatment of advanced-stage lesions at this location can be challenging. Cutaneous squamous cell carcinoma (cSCC) of the nasal planum in cats recently treated successfully with external beam radiation therapy [10].

Case History

A two years old male unowned domestic short hair cat, was referred by an animal rescue volunteer with severe lesions on the

nasal planum, rhinitis and mucopurulent nasal discharge that have been worsening gradually since 6 months ago. The cat had a normal appetite and received conservative treatment consisting of oral clindamycin (10 mg /kg) and doxycycline (5 mg/kg) BID for ten days but no obvious improvement was seen. In physical examination, ulcers involved the whole nasal planum, eventually leading to the loss of rostral nasal cartilage, nasal conchae and central upper lip, and left lower eyelid involvement but gingivostomatitis, and the oral ulcer was not detected (Figure 1). Surprisingly anodontia of the permanent teeth was also detected in the oral examination but because the case was unowned, so no exact history about the milky teeth was presented by a rescuer (Figure 2). Skull Radiograph showed no evidence of teeth or unerupted teeth from the mandible and maxilla and severe bilateral nasal concha turbinate destruction (Figure 3). Cytological examination of lesions revealed sparse cocci, many neutrophils and erythrocytes, and paraneoplastic (actinic) changes. Fine-needle aspiration of the submandibular lymph node showed no metastasis. The complete blood cells test (CBC) result was only mild leukocytosis (23000/µl) and mild decrease in packed cell volume (PCV=29). Biochemistry factors were in normal range. In abdominal thoracic radiograph, there was no sign of metastasis. The animal was sedated by intravascular ketamine (5 mg/kg)-and midazolam (0.4 mg/kg) administration and the skin biopsy was taken from the border area between the affected area and the normal skin. Infiltration of tumor cells as nest and trabeculae in dermis layer was noted in histopathology [4]. Keratinocytes with vesicular nuclei and distinct nucleoli and a high number of mitotic figures was noted (Figure 5). The presence of a Keratin pearl in the center of the tumoral nest confirms the occurrence of squamous cell carcinoma. There was a mild Pleomorphism and a high mitotic index. Keratin pearls were present in small quantities (Figure 6). Necrosis and severe inflammation around tumoral cells was obvious (Figure 7).

Regarding to international TNM grading system for this tumor, it was bigger than 5 cm in diameter and invades other structures (T_4), with no evidence of metastasis (M_0) and regional lymph node involvement (N_0) [11].

Due to severe destruction in ventral and dorsal nasal concha and cranial ethemotourbinates, and sever facial deformity the case euthanized by IV Propofol injection (2 mg/kg).

Figure 1: Ulcers and severe destruction in nasal planum in and upper lip.

Figure 2: Anodontia of the permanent teeth was noted in the cat.

Figure 3: Severe destruction in ventral and dorsal nasal concha and cranial ethemotourbinates and andontia was noted in the skull radiograph.

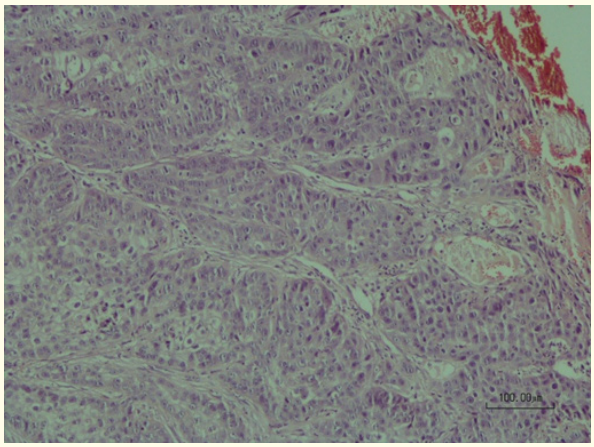

Figure 4: Infiltration of tumor cells as nest and trabeculae in dermis layer. H&E stain. X100.

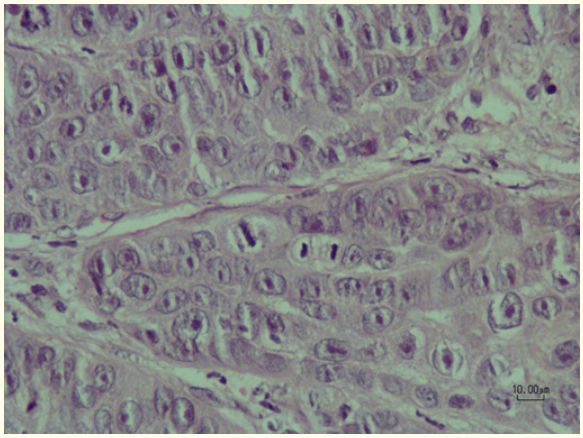

Figure 5: Keratinocytes with vesicular nuclei and distinct nucleoli and a high number of mitotic figures was noted. H&E stain. X400.

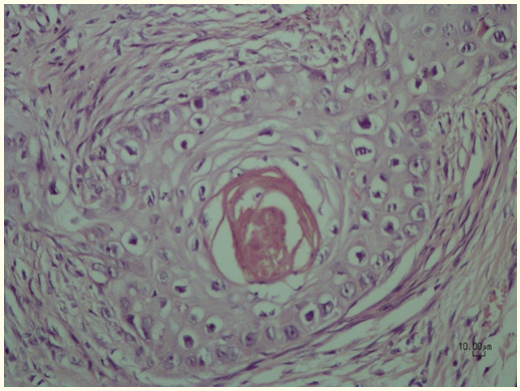

Figure 6: The presence of a Keratin pearl in the center of the tumoral nest confirms the occurrence of squamous cell carcinoma. .H&E stain. X400.

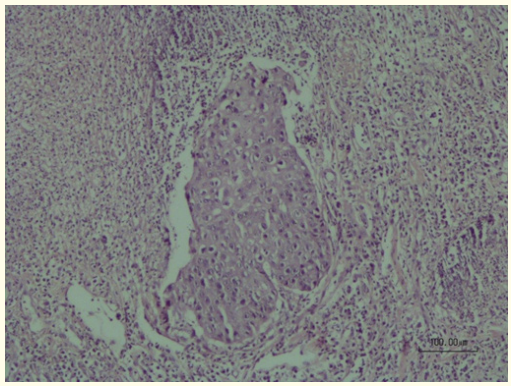

Figure 7: Necrosis and severe inflammation around tumoral cells. H&E stain. X100.

Discussion

SCCs account for 15% of skin tumors in cats. Most cutaneous SCCs in cats occur on the head often involving the paws, ears, pinna, eyelid, and nasal planum [12]. The cause of many cutaneous SCC is chronic exposure to ultraviolet (UV) radiation. Tumors caused by this etiology are mostly seen on the head and face and older and particularly fair-haired cats being at higher risk. and the nasal planum as a non-haired and often unpigmented area represents a predilection site for SCC in cats [13].

In this report, the animal's age was not defined exactly because the dental structures were not existing but based on the ophthalmoscopic examination and general appearance the cat was not geriatric and the tumor occurred in a nasal planum which is a common site of involvement.

Approximately half of SCCs occurring in the nasal planum of cats are associated with papillomavirus infection [7,9]. This finding shows that infection with papillomavirus can be one of the underlying causes of SCC [5]. Cutaneous SCCs are subdivided into invasive and multicentric types. They are locally invasive but metastasize occurs gradually [9]. Precancerous lesions can remain for months and years, and in some cats, these lesions can turn into more malignant and invasive carcinomas [2,8].

Several treatment methods can be used for tumors in the premalignant stage [2]. These methods include photodynamic therapy, plesitherapy [3] with strontium, Intraregional chemotherapy,

curettage, and diathermy. In 2016, tozon., *et al*. proved that electrochemotherapy with intravenous bleomycin injection is a safe method for control of cutaneous SCC [14]. For tumors that are bigger and more aggressive, tumor removal surgery can be done [2].

Conclusion

However, when invasive SCC grows on tissues such as the nose or inside the conjunctiva, it's complete removal is difficult and can lead to euthanasia as occurred for the presented case [9]. Also, according to the research in 2017 by Gasymova., *et al*. accelerated radiation has been introduced as one of the treatment methods [2]. Early diagnosis of SCC is paramount for prompt therapeutic intervention, which may result in long-term control or cure for affected patients.

Conflict of Interest

The authors declared that there was no conflict of interest.

Acknowledgment

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