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ORAL SQUAMOUS CELL CARCINOMA IN FELINE - CASE REPORT

Carcinoma de células escamosas oral em felino – relato de caso

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Abstract

Squamous cell carcinoma (SCC) is a malignant epithelial neoplasm formed from keratinocytes, accounting for 60 to 73% of the most common oral malignant tumors in felines. Its etiology is multifactorial and not fully elucidated; however, previous non-malignant lesions, consumption of canned products, and chronic exposure to ultraviolet light predispose its development. The sublingual and lingual regions, maxilla, mandible, oral mucosa, lip, and the pharyngeal region are the sites most frequently affected by oral SCC. The presumptive diagnosis is made through cytological analysis and confirmed by histological evaluation, with imaging being essential for classifying the location of the lesion and the extent of bone involvement. The present study aimed to describe the radiographic,

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cytopathological, and histopathological findings of a domestic feline, of no defined breed, six years old, that presented oral squamous cell carcinoma with intense bone involvement.

Keywords: Diagnosis. Bone lysis. Neoplasm. Radiography.

Resumo

O carcinoma de células escamosas (CCE) é uma neoplasia epitelial maligna formada a partir de queratinócitos, correspondendo de 60 a 73% dos tumores orais malignos mais frequentes em felinos. Sua etiologia é multifatorial e não totalmente elucidada, porém lesões não malignas prévias, ingestão de produtos enlatados e exposição crônica à luz ultravioleta predispõe seu desenvolvimento. A região sublingual e lingual, maxila, mandíbula, mucosa bucal, lábio e região da faringe são os locais mais frequentemente acometidos pelo CCE oral. O diagnóstico presuntivo é realizado por meio da análise citológica e confirmado através da avaliação histológica, sendo o exame de imagem essencial para classificação da localização da lesão e extensão do envolvimento ósseo. Objetivou-se com o presente trabalho descrever os achados radiográficos, citopatológicos e histopatológicos de um felino doméstico, sem raça definida, de seis anos de idade, que apresentou carcinoma de células escamosas oral com intenso acometimento ósseo.

Palavras-chave: Diagnóstico. Lise óssea. Neoplasia. Radiografia.

Introduction

The oral cavity is the fourth most common site for neoplasms in small animals (Pippi; Gomes, 2016), accounting for approximately 10% of tumors in felines, of which 90% are malignant (Bilgic *et al*., 2015). Squamous cell carcinoma (SCC) is a malignant epithelial neoplasm arising from keratinocytes (Rosolem *et al*., 2012) and is the most frequent oral malignancy in cats, representing 60–73% of malignant oral tumors (Beatty *et al*., 2000).

The etiology of SCC is multifactorial and not yet fully elucidated; however, exogenous factors such as prior non-malignant lesions, ingestion of canned foods, and chronic exposure to ultraviolet light are believed to predispose to its development (Daleck *et al*., 2016). Higher incidence has been reported in felines aged 9 to 14 years, in immunosuppressed animals, and in those with white or light-colored coats, with no sex or breed predisposition (Rosolem *et al*., 2012).

The sites most commonly affected by oral SCC in felines include the sublingual and lingual regions, maxilla, mandible, buccal mucosa, lip, and the caudal region of the pharynx and tonsils. Feline oral SCC shows a low metastatic rate to regional lymph nodes and, more rarely, to the lungs (Bilgic *et al*., 2015).

Clinical signs in felines with oral SCC include hyporexia, anorexia, weight loss, ptyalism, impaired or reduced grooming, halitosis, oral bleeding, dysphagia, exophthalmos, regional lymphadenomegaly, nasal obstruction, and tooth loss (Pippi; Gomes, 2016).

In most cases, the diagnosis of oral SCC can be presumptively established through cytological examination (Bonfanti *et al*., 2015). Cytology typically reveals epithelial cells with marked cellular pleomorphism, anisocytosis, anisokaryosis, and a high nucleus-to-cytoplasm ratio (Peteleiro *et al*., 2011).

Definitive diagnosis is achieved through histopathological analysis of the tissue (Pignone *et al*., 2012), which demonstrates neoplastic squamous epithelial cells arranged in cords and islands, with evident pleomorphism, prominent desmosomes, and occasional keratin pearl formation, associated with varying degrees of inflammation, necrosis, ulceration, and desmoplasia (Martin *et al*., 2010).

Imaging of the primary tumor is essential for assessing tumor location, degree of invasion, and surgical planning. Imaging modalities include radiography, computed tomography, and magnetic resonance imaging. Radiographs are useful for determining the extent of bone involvement. In feline oral SCC, radiographic findings may include osteolysis, periosteal proliferation, and dental resorption (Bilgic *et al*., 2015).

Maxillary lesions that invade bone tissue cause marked osteolysis and crater-like lesions due to destruction of the palatine process of the maxilla, incisive bone, and zygomatic arch, and may also exhibit areas of bone proliferation. Oral SCC affecting the mandibular region shows evidence of sunburst-like periosteal proliferation, bone lysis, and, in some cases, pathological fractures (Bilgic *et al*., 2015). It is estimated that a 30–50% change in bone mineral content is required before bone loss becomes radiographically detectable (Langland *et al*., 2002).

Once the diagnosis of oral SCC is established, treatment may involve surgery, chemotherapy, radiotherapy, or a combination of these modalities (Pippi; Gomes, 2016).

Early diagnosis plays a crucial role in prognosis, as outcomes vary according to tumor location and the severity of the condition at the time of diagnosis (Gayer, 2006).

The aim of the present study is to describe the radiographic, cytopathological, and histopathological findings in a domestic feline diagnosed with oral squamous cell carcinoma.

Case Report

A female domestic shorthair cat (mixed breed), weighing 2.3 kg and aged six years, was examined at the Veterinary Center of the Octávio Bastos Foundation University Center (UNIFEOB), São João da Boa Vista, São Paulo, Brazil.

The animal presented with facial swelling, hyporexia, apathy, and a history of having undergone an oral prophylaxis surgical procedure with dental extractions performed by another professional, who had diagnosed the condition as feline gingivostomatitis complex.

On physical examination, vital parameters were within normal limits. Mild dehydration, normochromic mucous membranes, a cachectic general condition, absence of reactive lymph nodes, and bilaterally dry, opaque eyes with discharge were observed. The facial swelling extended from the mandibular region to the right lateral maxillary region. Intraoral examination revealed an ulcerative, hyperemic mass in the cheek region.

The animal was referred to the Complementary Propaedeutics sector for cranial radiography under sedation. Imaging revealed a mixed bone lesion with marked areas of lysis and bone proliferation, loss of trabecular pattern throughout the cranial bones, with greater involvement of the right hemiface. An extensive lytic area was noted in the zygomatic arch, maxilla, and nasal cavities, along with absence of dental elements in the right maxilla and increased soft tissue volume in the dorsal and right lateral regions of the skull (Figure 1).

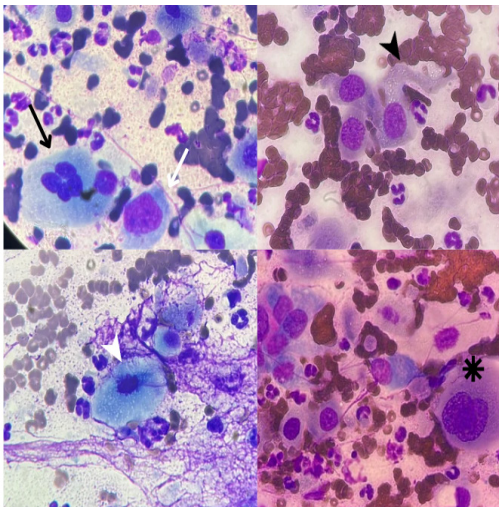
Figure 1 – Left laterolateral (LL) and open-mouth rostrocaudal projections of a six-year-old feline. Loss of trabecular pattern in the cranial bones with lytic and proliferative areas

Source: Gonçalves *et al*. (2024). Veterinary Center (UNIFEOB), São João da Boa Vista, 2024.

Concomitantly with sedation—performed using xylazine at 0.8 mg/kg and methadone at 0.3 mg/kg as preanesthetic medication, and induction with propofol at 3 mg/kg, ketamine at 1 mg/kg, and fentanyl at 1.5 mg/kg—a cytological sample was collected. The specimen was obtained by fine-needle aspiration (FNA) of the intraoral mass.

Microscopic examination revealed the presence of neoplastic epithelial cells, which occasionally exhibited cytoplasmic projections (tadpole-like appearance). Individually, the cells showed abundant basophilic cytoplasm and round to oval nuclei, central to paracentral in position, with stippled chromatin and moderate anisocytosis and anisokaryosis. Moderate multinucleation with mild karyomegaly and rare mitotic figures was observed. Inflammatory cells were also present alongside the neoplastic cells. Cytological analysis was interpreted as suggestive of squamous cell carcinoma (Figure 2).

Figure 2 – Cytological smear of material collected from an intraoral mass of a six-year-old feline[1]



Source: Gonçalves *et al*. (2024). Veterinary Center (UNIFEOB), São João da Boa Vista, 2024

1 The presence of neoplastic epithelial cells is observed, exhibiting multinucleation (black arrow), karyomegaly (white arrow), tadpole tail formation (black arrowhead), a mitotic figure (white arrowhead), and binucleation (asterisk).

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Hematological and serum biochemical analyses showed values within the reference range for the species and age. Based on the clinical presentation, home treatment was prescribed, consisting of prednisolone at 0.5 mg/kg every 24 hours for 7 days to reduce inflammation, tramadol at 3 mg/kg every 12 hours for 7 days for pain control, and ophthalmic treatment with lubricating eye drops applied every 4 hours in both eyes until further recommendations.

Two days after the initiation of treatment, the owners returned to the veterinary center without the animal and reported significant clinical deterioration, including facial pain and hyporexia. They also stated that they were unable to administer the prescribed medications. The examination results were presented, the severity and prognosis of the case were explained, and palliative treatment was recommended.

Three days after this visit, the owners returned with the patient, reporting further clinical worsening, and elected to proceed with euthanasia. With the owners' authorization, tissue samples from the intraoral lesion were collected for analysis.

Histological examination revealed areas of neoplastic invasion characterized by islands of epithelial cells infiltrating adjacent soft tissues and bone, resulting in extensive regions of bone lysis and necrosis, accompanied by intense lymphoplasmacytic inflammation. These findings supported the definitive diagnosis of squamous cell carcinoma.

Discussion

The clinical signs observed in the animal described in this case report consisted primarily of facial swelling extending from the mandibular region to the right maxilla, sites that are commonly reported in cases of oral squamous cell carcinoma (Bilgic *et al*., 2015).

In the present case, radiographic examination proved to be of critical importance for assessing lesion location, degree of invasion, and the extent of bone involvement. Reactive processes and bone destruction, as well as soft tissue edema, were identified—findings that are consistent with neoplastic processes or osteomyelitis (Kealy *et al*., 2010).

Cytological analysis revealed the presence of neoplastic epithelial cells, suggesting a presumptive diagnosis of squamous cell carcinoma (SCC). This interpretation was based on the observation of features such as marked cellular pleomorphism, anisocytosis, and anisokaryosis (Peteleiro *et al*., 2011), in addition to typical cellular morphologies, including rounded, angular, and tadpole-shaped forms, which are frequently associated with SCC (Barger; Macneill, 2017).

Histological findings, including neoplastic epithelial cells arranged in islands, necrosis, and bone invasion, are commonly observed in cases of SCC. These lesions may also present occasional keratin pearls, prominent desmosomes, and varying degrees of inflammation and desmoplasia (Martin *et al*., 2010).

Based on the cytological and histological findings, in association with the radiographic signs, a definitive diagnosis of oral squamous cell carcinoma was established.

Conclusion

Radiographic examination played a fundamental role in the identification and evaluation of the characteristics of bone lesions associated with oral squamous cell carcinoma. Cytological analysis complemented the radiographic findings, leading to a presumptive diagnosis that was subsequently confirmed by histological evaluation.

These results highlight the importance of combining diagnostic approaches to ensure diagnostic accuracy and to support the most appropriate therapeutic decision-making.

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