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Pathological studies on nasal squamous cell carcinoma in canine

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Abstract

The present study was conducted to find out the haematological and histopathological alterations in dogs affected with nasal squamous cell carcinoma. Whole blood samples were collected from three mongrel dogs with a history of mucopurulent nasal discharge, unilateral epistaxis and swelling on the dorsum of the head for the past 6-12 months. Hematological alterations and histopathology of the biopsy samples were carried out for confirmation of squamous cell carcinoma in the nasal cavity of dog.

Keywords: Dogs, nasal squamous cell carcinoma, hematology, histopathology

Introduction

Tumours of the nasal planum in dogs are rare (Withrow, 1996). Adenocarcinoma of the respiratory tract is most common followed by transitional and squamous cell carcinoma (Wilson and Dungworth, 2002). Among the tumours of the nasal cavity, squamous cell carcinoma (SCC) is rare in the dog. There is little information about the SCC of the nasal planum in dogs. This work was aimed to analyse the haematological alterations and histopathological findings of the biopsied samples in the nasal cavity of the dog.

Materials and Methods

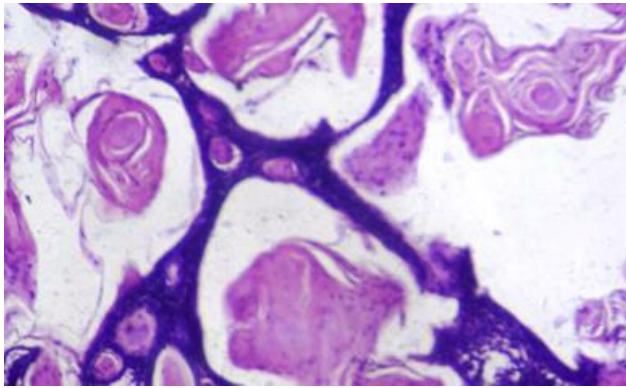
An eight to eleven year-old, 3 male, mongrel dogs with a history of mucopurulent nasal discharge, unilateral epistaxis and swelling on the dorsum of the head (Fig.1) for the past 6-12 months were used for this study. Clinical examination revealed presence of ulcerated mass on the nasal planum. The dogs were evaluated by means of haematological panels and biopsies of the mass. Blood samples, about 1 ml, were collected using EDTA vacutainer and processed. Appearance of erythrocytes was analysed from peripheral blood smear. Haematological parameters were estimated by using auto-analyser. Biopsy samples were collected from the mass and fixed in 10 per cent neutral buffered formalin for histopathological examination. After fixation, the biopsy tissues were embedded in paraffin and 4-5 μ m thick sections were cut and stained with Haematoxylin and Eosin (Bancroft and Gamble, 2008).

Results and Discussion

Haematological results are presented in Table-1. Peripheral blood smear examination of two dogs showed anaemic changes with a morphologic type of normocytic and normochromic anaemia. One case showed normal haematological profile and did not show any anaemic changes. Haematological examination revealed marked decrease in the haemoglobin, packed cell volume, red blood cell count and platelet while reverse noted for leucocytes in 2 cases. In this study, anaemia was most likely due to advanced/chronic clinical stages of the neoplasm. Cancer related anaemia is due to complex interactions between tumour cells and the patient's homeostatic control of erythrocyte manufacture and metabolism mediated via inflammatory cytokines (Birgegard *et al.* 2005). Radiographically, no pulmonary metastasis was observed in all 3 cases. Microscopical examination of the biopsy samples revealed well differentiated squamous cell carcinoma (SCC) is characterised by variable sized cords, Strands or nests of proliferating neoplastic squamous cells with centrally placed extensive keratin pearls (Fig.2). Neoplastic cells consisting of pleomorphic cells with large vesicular nuclei contained prominent nucleoli. Mitotic figures were also seen. These findings is in agreement with earlier worker Chandrashekaraiyah *et al.*, 2011.

Table 1: Values of the hematological parameters of the dogs with nasal SCC

Parameters	Mean \pm S.E (n=2)	Reference values (Rizzi <i>et al.</i> , 2010)
Haemoglobin (g/dL)	6.7 \pm 0.48	12-18
PCV (%)	21.5 \pm 1.48	37-55
RBC (x 10 ⁶ / μ L)	3.4 \pm 0.18	5.5-8.5
WBC (/ μ L)	46900 \pm 4214.12	6000-17000
Platelets (/ μ L)	159000 \pm 12358.20	200000-500000

**Fig 1:** Dog - Swelling on the dorsum of the head region**Fig 2:** Dog – SCC- Nests of proliferating neoplastic squamous cells with keratin pearls. H&E-100x

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Summary

Based on the above study results it could be confirmed that older dogs presenting with ulcerative lesions of nasal planum should be initially biopsied to confirm the early diagnosis of squamous cell carcinoma (SCC) and we conclude that, normocytic and normochromic anaemia was the major morphological type of anemia in dogs with SCC.

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