Cytological and complete blood count profile in a dog with suspected skin tumours

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ABSTRACT: Skin tumours are among the most prevalent neoplasms in older dogs, and often display diverse clinical signs. This case report outlines the clinical presentation, diagnosis, and treatment of a suspected skin tumour in a 10-year-old obese female Golden Retriever weighing 46 kg. The owner brought the dog to West Java Provincial Animal Hospital with mandibular swelling, decreased appetite, and tachypnoea. Physical examination revealed a rectal temperature of 40.1°C, painful mandibular swelling, respiratory rate of 236 breaths per minute, and heart rate of 88 beats per minute. Cytology revealed pleomorphism, coarse chromatin, and nuclear moulding, suggesting increased cellular activity. Haematological results showed leukocytosis, granulocytosis, and hyperchromic normocytic anaemia, likely due to the release of proinflammatory cytokines from the tumour and immune cells. Differential diagnosis included sialadenitis, apocrine gland tumours, and salivary gland adenocarcinoma. The final diagnosis was skin tumour with poor prognosis. The treatment involved iron dextran, supplements, dexamethasone, sulfadiazine-trimethoprim, cyproheptadine HCl, and tolfenamic acid.

Keywords:
dog, complete blood count, cytology, skin tumours

■ INTRODUCTION

Skin tumours in dogs are characterised by uncontrolled growth of cutaneous and subcutaneous tissues (Mango *et al*. 2016). They account for approximately one-third of all tumours frequently encountered in dogs (Brazzel *et al*. 2020). These tumours can range from benign to malignant, and owing to the high turnover rate of the skin, it is particularly prone to genetic abnormalities and mutations. Research estimates that the annual incidence of skin tumours in dogs is approximately 728 cases per 100,000 dogs (Hassan *et al*. 2022). In contrast, skin tumours constitute 41–56% of all tumours in cats (Filgueira *et al*. 2022).

Diagnosing skin tumours in dogs through haematological analysis involves assessing blood parameters to understand the presence and nature of neoplasms. Anaemia is a common finding, indicating a systemic condition associated with malignancies, while leukocyte counts can reveal either leukocytosis or leukopenia based on tumour type and the body's response (De Nardi *et al*. 2022). Transmissible venereal tumours are typically diagnosed histopathologically (Putranto *et al*. 2022). Despite this, there is limited research connecting haematological profiles with cytology for diagnosis. This article reviews the complete blood count results of dogs with suspected skin tumours at the West Java Provincial Animal Hospital to explore these diagnostic insights.

■ CASE

Signalment and Anamnesis: A 10-year-old female Golden Retriever weighing 46 kg, classified as obese, presented with swelling of the mandibular area. The dog exhibited decreased appetite and tachypnoea. **Physical examination**: Rectal temperature of 40.1°C, painful mandibular swelling, a respiratory rate of approximately 236 breaths per minute, and a heart rate of 88 beats per minute. **Cytological analysis**: Pleomorphism, characterised by variations in nuclear and cell shapes, coarse chromatin signifying increased cellular activity, and nuclear moulding, where nuclei press against each other (Figure 1).
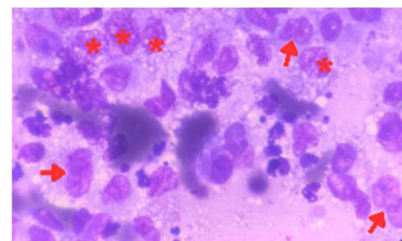

Figure 1. Cytology results showed cell pleomorphism, rough chromatin (*), and nuclear molding (arrow). Giemsa staining, 100x magnification.

Haematological assessment: Leukocytosis, granulocytosis, and hyperchromic normocytic anaemia (Table 1). **Differential diagnoses**: Sialadenitis, apocrine gland tumour, and salivary gland adenocarcinoma. Diagnosis: Skin tumour. **Prognosis**: Poor. **Treatment**: Iron dextran (Hemadex®), ATP and multivitamin (Biosan TP® Inj.), dexamethasone (Glucortin-20®), sulfadiazine, and trimethoprim (Colibact®, Inj.), cyproheptadine HCl (Pronicy®), and tolfenamic acid (Tolfedine CS® Inj.).

■ RESULT AND DISCUSSION

Given the physical examination, clinical findings, complete blood count, and cytological results of the mandibular mass, the dog was suspected to have a skin tumour. Cytological evaluation of tumours can enhance the diagnostic process by identifying tumour types through cellular characteristics and specific markers (De Nardi *et al*. 2022). This approach is particularly useful for diagnosing round cell tumours such as mast cell tumourss and lymphomas, where cytological features are often definitive (Salvi *et al*. 2021). Blood count revealed leukocytosis, granulocytosis, and hyperchromic normocytic anaemia (Table 1). Cytology revealed irregular nuclear membranes, coarse chromatin, and sharp-angled nucleoli, which are typical of malignant tumours (Mehrotra *et al*. 2007). Proinflammatory cytokines produced by both tumour and immune cells activate macrophages and contribute to anaemia by increasing erythrocyte destruction (Madeddu *et al*. 2018).

Research has indicated that patients with skin tumours often have elevated leukocyte levels (Millrud *et al*. 2012). Tumour and immune cells release pro-inflammatory cytokines, notably IL-6, which increases leukocyte counts, particularly that of neutrophils (Polymeris et al. 2020). Solid tumours, such as those in the head and neck, may also release cytokines such as granulocyte colony-stimulating factor (G-CSF) and granulocyte-macrophage CSF (GM-CSF), leading to leukocytosis and granulocytosis (Laskou *et al*. 2022).

Table 1. Complete blood count of a dog with suspected skin tumours.

Parameters	Results	Normal Value
Total WBCs (x10³µL)	**24.3**	6.0 – 17.0
Lymphocytes (x10³µL)	4.9	0.8 – 5.1
Mid (x10³µL)	**3.1**	0.0 – 1.8
Granulocytes (x10³µL)	**16.3**	4.0 – 12.6
RBC (x10⁶µL)	**5.48**	5.50 – 8.50
HGB (g/dL)	14.8	11.0 – 19.0
HCL (%)	**35.5**	39.0 – 56.0
MCV (fL)	64.8	62.0 – 72.0
MCH (pg)	**26.8**	20.0 – 25.0
MCHC (g/dL)	**41.4**	30.0 – 38.0
PLT (x10³µL)	324	117 – 460

Note: WBC=white blood cells, Mid=WBC not classified as lymphocytes or granulocytes, RBC= red blood cell, HGB=Hemoglobin, HCL=hairy cell leukemia, MCV=mean cell volume, MCH=mean cell hemoglobin, MCHC=mean cell hemoglobin concentration, PLT=platelet, bold red=increase, bold blue=decrease

■ CONCLUSION

A complete blood count in dogs with suspected skin tumours showed leukocytosis, granulocytosis, and hyperchromic normocytic anaemia linked to proinflammatory cytokine release. Cytological examination revealed irregular nuclear membranes, coarse chromatin, and sharp-angled nucleoli, suggesting malignancy.

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