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# Diagnosis of different types of tumour by cytology in dogs

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## Introduction

A tumour or neoplasm is a new growth of cells which proliferate continuously without control, bear quite resemblance to the healthy cells from which they arise, serves no useful function and have no orderly structural arrangement. Tumors are broadly classified as benign and malignant. Benign tumors are localised, grow slowly, never metastasize and are usually harmless. Whereas malignant tumors grow rapidly by expansion, show numerous mitotic figures, grow continously and always metastasize.

## Diagnosis of neoplasms

1. *Clinical:* From clinal signs and symptoms, any swelling which bleeds profusely, and does not heal.
2. *Biopsy examination*: Pathological examination of biopsy material is reliable method of diagnosis. Malignancy can be inferred from anaplasia, invasion and loss of polarity.
3. *Radiology*: More applicable to small animals. Diagnosis of tumor in viscera and bone is possible.
4. *Chemical and serological tests*: Various tests are used in the diagnosis of tumor like immunohistochemistry.
5. *Fine needle aspiration cytology*: It is used to investigate lumps or tumor. In this technique, a hollow needle is inserted into the mass and after being stained, is examined under microscope.

In veterinary practice different types of tumor are being diagnosed based on cytology. The different types of tumors diagnosed by cytology in dogs are:

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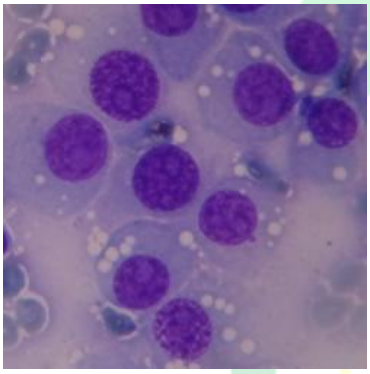
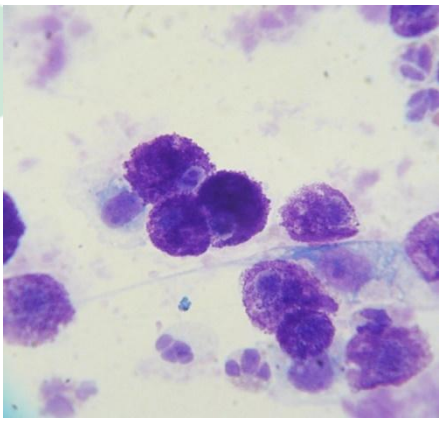
**Transmissible venereal tumor (TVT)**: TVT is also known as sticker's tumor. Itis a transmissible cancer that affects dogs. It is spread by the transfer of living cancer cells between dogs, usually during mating. In male dogs, it affects the penis and foreskin whereas in female dogs, it affects the vulva. The tumor mostly has cauliflower like growth.

*Cytology* : TVT is a round cell tumor. The cells will be large round with eccentric nucleus. There will be increase nuclear to cytoplasmic ratio, coarse chromatin, one to two prominent nucleoli and lightly basophilic vacuolated cytoplasm.



**Mast cell tumor (MCT)**:Mast cell tumors are the most common skin tumors in dogs. They can affect dogs of any age but mostly affect middle age to older dogs. MCTs have a wide range of gross appearance, from raised and superficial to very deep and fixed. They may feel soft and fluctuant or firm. They can be located anywhere on the body and may lie within the dermis or subcutis.

*Cytology*: Cytoplasm frequently contains numerous metachromatic granules. Nuclei are often round. In dogs, inflammation with eosinophils is also seen. Metachromatic granules can be best stained with toludine blue.



**Lymphoma**: It is one of the most common malignant tumors to occur in dogs. It is classified into four categories based on location *i.e.*, multicentric, mediastinal, gastrointestinal and extranodal. Muticentric is the most common type. It is further classified on the basis of B or T lymphocytes. Muticentric lymphoma is presents as generalised painless lymph node enlargement.

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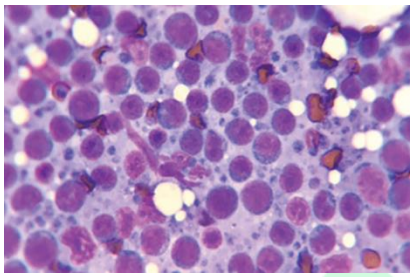
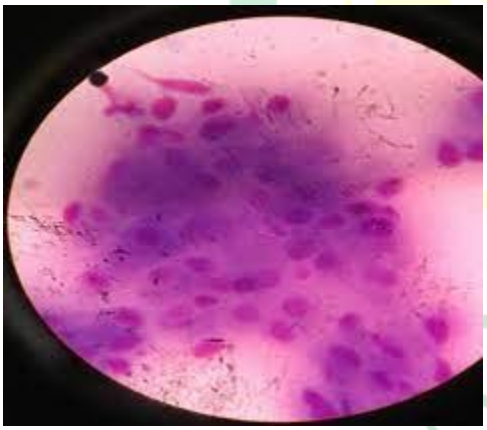
*Cytology*: Cells contain moderate amount of deeply basophilic cytoplasm. There will be high nuclear to cytoplasmic ratio. Nuclei are round to polygon in shape.



**Perianal adenoma**: Perianal glands are non-secretory modified sebaceous glands occuring normally around the anus of dogs but can also be present at other sites like skin of prepuce, tail, loin, groin, posterior part of hind limbs, ventral surface of abdomen, head and neck. Perianal adenomas comprise more than 80% of all perianal tumors and are the third most common tumor in male dogs because of their testosterone dependence.

*Cytology*: On cytology, large cuboidal isolated epithelial cells but primarily found within adherent cell clusters are seen. Low nuclear; cytoplasmic ratios, round nuclei, single, distinct nucleolus are present. Mild anisocytosis and anisokaryosis can also be seen.



**Mammary gland tumor**: Mammary gland tumor are the most common type of tumor in the unsprayed bitches. The last two set of glands are most commonly affected. The tumors can be firm or soft, lumps or diffuse swellings. They can be attached to the underlying tissue or moveable, can be skin covered or ulcerated. According to type of tissue from which they are originated, they are classified as epithelial tumor, mesenchymal tumor and mixed tumors.

*Cytology*:On cytology, epithelial tumors are seen as cluster, clumps or sheets of cells with round to oval nuclei and clear cytoplasmic boundaries. Mesenchymal appear as individual settled cells mixed with extra cellular matrix, with oval/elliptical nuclei, polygonal cells. In mixed tumor, both epithelial and mesenchymal cellular elements in variable number are seen.

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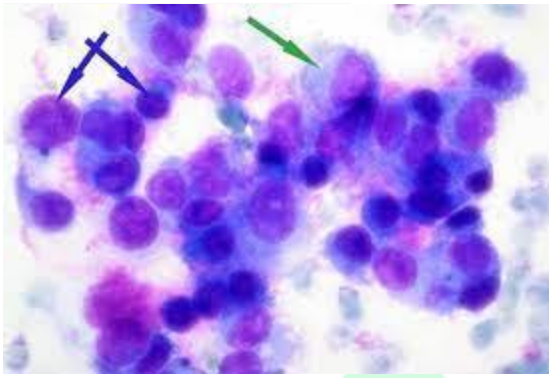
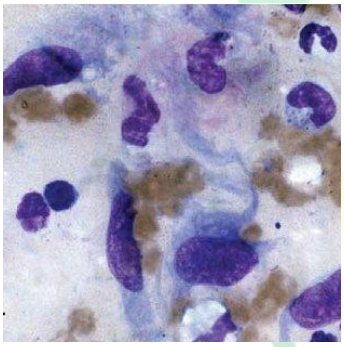


**Hemangiopericytoma**: Hemangiopericytoma is a malignant tumor that affects the cells surrounding the capillaries in subcutaneous tissue. The most common site for hemangiopericytoma is the extremities. Tumors may be present as a firm nodule or as a soft gelatinous swelling.

*Cytology*: On cytology, large numbers of individually arranged cells with thin, wispy cytoplasmic tails are seen. Low numbers of small, punctuate, clear cytoplasmic vacuoles are observed. Nuclei are oval, plump and often contain one or two prominent nucleoli. Anisokaryosis moderate to marked is seen.



**Osteosarcoma**: Osteosarcoma is one of the most common bone tumor found in dogs. It can affect any breed, but most commonly found in the larger breeds. The disease has tendency to metastasize rapidly into other parts of the dog's body. Clinical signs depend on the location of primary tumors. In appendicular tumor, the typical clinical signs are lameness and local swelling at the tumor site.

*Cytology*:On cytology, large number of individual, oval to spindle shaped cells are seen. These cells contain moderate amounts of deeply basophilic cytoplasm with discrete cytoplasmic borders. Nuclei are round to oval and eccentrically located in the cytoplasm. There is marked anisokaryosis and nuclei contain clumped chromatin with prominent, multiple, pleomorphic nucleoli.

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