



Vaginal Cytology in A Queen

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ABSTRACT: Vaginal cytological testing is carried out in both canine and feline species to determine the oestrous cycle stage and the existence of reproductive or endocrine disorders. Vaginal epithelial cells are examined under a microscope, although subjective interpretation may result in inconsistent results. In present case report, a 2 year old queen was brought to TVCC, Durg for determination of stage of estrus cycle in order to be bred at the optimum time. The examination was performed by vaginal cytology and straining by Giemsa stain. The purpose of this study was to examine exfoliated vaginal cells in the cat during the estrus cycle to determine the different cyclic changes at the time of estrus.

Keywords : Queen, Exfoliated Vaginal Cells, Geimsa stain , Vaginal Cytology.

INTRODUCTION

The female cat (queen) is described as being seasonally polyoestrus and an induced ovulator. On an average oestrus, which is termed as behavioural receptivity to mating, lasts for five to seven days in cats. According to Lawle *et al.* (1993), oestrus is characterised by physical behaviours such as vocalisation, crouching, stepping, affection, rolling, and lordosis. In most cases, ovulation is triggered by mechanical stimulation of the vagina during coitus; spontaneous ovulation is uncommon. A luteinizing hormone (LH) peak is brought on by coitus, and ovulation occurs after 24–56 hours as stated by Paape *et al.* (1975). Corpora lutea then develops, and as it can be observed by increase in blood progesterone at 24–48 h after ovulation and the queen enters the dioestrus stage of the sexual cycle common in both feline and canine species, vaginal cytological examination is used to assess the stage of the oestrous cycle and the presence of endocrine or reproductive pathologies. The vaginal epithelium is one of the target tissues for examining the ovarian hormones, especially oestrogens, and characteristic changes in exfoliated vaginal epithelial cells occur as a result of changing secretory patterns of these hormones. Increasing oestrogen concentrations determine cell proliferation, with the thickening of the vaginal epithelial layers and consequent cell differentiation according to Herron (1977); Mattos *et al.* (2003); Kanca *et al.* (2014). The

"Cornified cells" refers to both superficial cells and non-nucleated squamous cells. Additionally, red blood cells (RBCs), bacteria, and polymorphonuclear leukocytes (PMNs or neutrophils) are frequently seen in vaginal cytology (Kustritz, 2020). The multiple deep learning models were used to classify images of cats and dogs from four distinct estrus periods. Each model's classification performance was compared using the accuracy values that were acquired (Kalkan *et al.*, 2025). Compared with the bitch, vaginal cytology is less commonly used in the queen for several reasons. First, the cellular changes seen in the feline vagina can be rather ambiguous compared with the generally more obvious changes seen in the bitch. The aim of the present case report is to describe the method of determination of oestrous stage in a queen.

CLINICAL OBSERVATION AND HISTORY

In the present case report a 2 year old cat nulliparous was brought to TVCC, Durg with the complaints about oestrus-like behaviours for a maximum duration of 3 to 4 days. Vaginal swab was taken on 4th day of symptoms and on day 6th. Oestrus was confirmed by vaginal cytological examination of day 6th of the estrus sign shown by the cat. A collection with cotton swab of 3-mm diameter, dipped in a normal saline solution, was gently placed in the vagina and rotated (Fig. 1). After rolling on a glass slide, the smear was stained using Geimsa

staining technique and examined under 10x or 40x microscopically (Fig. 2 and 3).

DISCUSSION

In cats, vaginal cytology is a useful non-invasive method for determining reproductive health, identifying diseases, and assisting in breeding initiatives. However, it must be understood in consideration of the reproductive physiology is peculiar in cats, especially the fact that queens are induced ovulators, which means that their cytologic findings and oestrous cycle are more varied than those of dogs or other spontaneous ovulators (Johnston *et al.*, 2001). The epithelial cells were evaluated and categorised as parabasal, intermediate, superficial, or anucleated in the current case report. According to Herron (1977) the parabasal cells are small, round, high nucleus-to-cytoplasm ratio they are predominant in anestrus or diestrus. Intermediate cells these are larger, irregular shape and more cytoplasm they are found throughout cycle, more in early and phases. Superficial and anucleated cells these are large, pyknotic or absence of nucleus angular indicative of estrus. Neutrophils are inflammatory cells normal in diestrus and indicates infection if present in abundance. The parabasal and intermediate cells are categorized as "non-cornified" Parabasal cells divide in response to an increase in estrogen, producing superficial cells, also known as superficial, intermediate cells, which are big and irregularly shaped, with a relatively small nucleus and abundant cytoplasm. Certain superficial cells are known as non-nucleated squamous cells because they do not have visible nuclei following labeling. Surface cells and non-nucleated squamous cells are commonly referred to as "cornified." Additionally, red blood cells (RBCs), bacteria, and polymorphonuclear leukocytes (PMNs or 41 neutrophils) are frequently seen in vaginal cytology (Kustritz, 2020). According to Kalkan *et al.* (2025) in order to improve accuracy, research investigates artificial intelligence (AI), particularly deep learning of estrous cycle A total of 1,096 vaginal smear samples were gathered, stained, digitalized, and subjected to artificial intelligence analysis. With 97.65% accuracy, the Xception model was the most accurate. The results highlight AI's potential to enhance reproductive health evaluations in veterinary medicine, decrease subjectivity, and increase diagnostic consistency. In the present case report the vaginal smears were examined under microscope and type of cells seen on day 6 were more than 60% superficial epithelial cells while few appeared anucleated, indicating the cat is in estrus and can be allowed for mating (Fig. 3).



Fig. 1. Collection of vaginal sample.



Fig. 2. Rolling of swab in a glass slide.

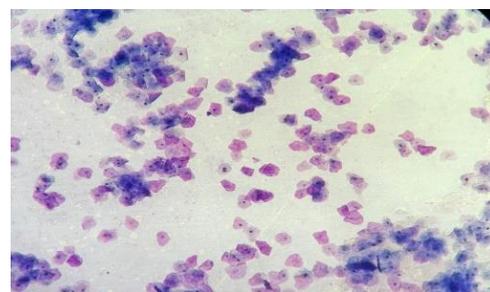


Fig. 3. Superficial and anucleated cells.

CONCLUSIONS

In queens during oestrus results in a significant increase in the number of superficial cells and anucleated cells and a significant decrease in parabasal and intermediate cells values of vaginal epithelial cells. Vaginal cytology can be effectively use for determination of estrus stage in queens.

REFERENCES

- Herron, M. A. (1977). Feline vaginal cytologic examination. *Feline Pract.*, 3, 36–39.
- Johnston, S. D., Kustritz, V. R. & Olson, P. N. S. (2001). The feline estrous cycle. In: Johnston S.D., Kustritz V.R., Olson P.N.S., editors. *Canine and feline theriogenology*. WB Saunders, Philadelphia, 396–405.
- Kalkan, M., Yuksel, B. F. Turanli, M. Muhammed, U. & Kalkan, C. (2025). Deep Learning–Assisted Vaginal Cytology for Estrus Classification in Dogs and Cats. *Journal Wileyonlinelibrary.Com Journal*, 1–14.
- Kanca, H., Karakas, K., Dalgic, M. A., Salar, S. & Izgur, H. (2014). Vaginal cytology after induction of ovulation in the queen: comparison of postoestrus and dioestrus. *Australian Veterinary Journal*, 92(3), 65-70.
- Kustritz, M. V. R. (2020). Vaginal cytology in the bitch and queen. *Veterinary cytology*, 552–558.
- Mattos, M. R. F., Simoes-Mattos, L. & Da Silva, L. D. M. (2003). Vaginal cytology in queens with estrus induced with equine chorionic gonadotrophin. *Rev Port Cienc Vet.*, 98, 135–138.
- Paape, S. R., Shille, V. M. & Seto, H. (1975). Luteal activity in the pseudopregnant cat. *Biol Reprod*, 13, 470–474.

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