

CLINICAL APPROACH TO ORAL PAPILLOMATOSIS IN DOMESTIC CATS: A CASE STUDY

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Abstract

Papilloma is an abnormal tissue growth in the form of a tumor or wart. Clinical signs of oral papillomatosis include the presence of lesions or masses growing in the oral cavity. Oral papillomatosis in cats is caused by the Canine Papillomavirus (CPV), which induces tumor formation by infecting cells through wounds in the tissue. The purpose of this report is to examine the diagnosis and management of oral papillomatosis in mixed-breed domestic cats at the Yogyakarta Animal Clinic. The diagnosis of papillomatosis can be made by observing visible clinical signs and confirming the diagnosis through cytological examination of the tumor mass. The treatment for oral papillomatosis involves surgically removing the tumor mass along with surrounding tissue. Postoperative therapy includes administering antibiotics (Cefixime®), anti-inflammatory drugs (Methylprednisolone®), and antifungal agents (Candistatin®). The study results indicate that tumor removal combined with antibiotic treatment shows positive outcomes in accelerating healing and preventing secondary infections. However, ongoing monitoring and maintaining oral hygiene are necessary to ensure long-term recovery.

Keywords: Cat, Cytology, Papilloma

INTRODUCTION

Cats generally exhibit active and sometimes aggressive behavior. Excessive aggression in cats can become a serious issue, as it may cause injuries to themselves, other animals, or even their owners (Tuzio et al., 2004). As pets, cats require proper care. Therefore, greater attention should be given to their health status, adequate nutrition, physical care, and the cleanliness of their cages and living environment (Fatma et al., 2021). Neglect can be avoided by gaining a deeper understanding of a cat's body language and behavior. Cats are highly susceptible to illness if not properly cared for. Understanding symptoms through a cat's movements and behavior from the owner's perspective can aid in the diagnostic process when the cat is sick or injured. Therefore, it

is important for owners to consistently monitor their cats' health (Rodan & Heath, 2015).

Some diseases in cats can be very serious, while others are relatively common. According to Eldredge et al. (2008), there are nine groups of diseases that affect cats: Feline Viral Rhinotracheitis, Feline Calicivirus, Feline Chlamydiosis, Feline Panleukopenia, worm infestations, enteritis, scabies, dermatitis, and ear mites. One disease that significantly impacts the comfort and health of cats is oral papillomatosis. In many cases, the lesions are mild and cause only minor discomfort or complications. However, severe lesions can lead to difficulties in eating and drinking,

and may even obstruct the airways (Lane et al., 2017).

Papillomavirus (PV) is a non-enveloped, icosahedral virus that commonly infects stratified squamous epithelial cells in mammals, as well as some species of birds and reptiles. PV has a circular double-stranded DNA genome approximately 8,000 base pairs in length. This virus belongs to the family Papillomaviridae, which is currently divided into about 18 types based on host, DNA sequence similarity, and biological properties, including the diseases it causes (Munday et al., 2017).

Instead of dividing normally to produce smooth tissue, infected cells divide more frequently and in an abnormal pattern, leading to the formation of lumps. Typically, a cat's immune system can stop the replication of the virus, allowing the cat to carry the papillomavirus without showing symptoms. However, in rare cases, the immune system fails to respond appropriately, resulting in warts or skin lesions. Papillomatosis is very rare in cats and is transmitted through direct contact with an infected cat or contaminated objects. Papillomas appear as small, scaly bumps on the skin or inside the oral cavity. Cats showing symptoms of papillomatosis require immediate veterinary attention, as untreated papillomas can develop into cancer. If the condition does not resolve on its own, surgical removal may be necessary.

Before 1990, papillomavirus (PV) was not known to infect or cause disease in domestic cats. The use of histology, immunohistochemistry, and molecular techniques has revealed that PV can cause feline viral plaques, Bowenoid carcinoma in situ, oral papillomas, and feline sarcoids (Munday et al., 2019). Increasing evidence suggests that PV plays a significant role in the development of squamous cell carcinoma in cats, one of the most common skin cancers in felines. Papillomavirus (PV) infects and alters keratinocytes, leading to

the formation of warts on the skin or mucosal papillomas.

The management of oral papillomatosis can be performed through the removal of the tumor mass. Surgery is indicated if the animal's condition rapidly worsens and the tumor mass grows significantly in a short period (Ibarra, 2018).

MATERIALS AND METHODS

The management of the mixed domestic cat suffering from Oral Papillomatosis began from the patient's arrival until their discharge from the Yogyakarta Animal Clinic, located at Jalan Pamularsih No. 55, Klaseman Condongcatur, Ngabean Wetan, Siduharjo, Ngaglik District, Sleman Regency, Special Region of Yogyakarta 55581.

The examination methods included physical examination and cytology. Tumor removal was performed through a surgical procedure. The premedication used was atropine sulfate, administered subcutaneously. The anesthesia employed was a combination of ketamine and xylazine, administered via intravenous (IV) injection. The tumor removal procedure was carried out using a surgical cautery on the gum area. After the tumor was removed and no bleeding was detected, the oral cavity was flushed to clean it and prevent infection.

After the tumor removal surgery, the cat underwent a period of hospitalization to monitor its condition. During this time, pain relief medication was administered along with antibiotics to prevent infection. A prescription for home care was provided after the cat completed its hospitalization.

This research method outlines the activity design, scope or subject, main materials and tools, location, data collection techniques,

operational definitions of research variables, and analysis techniques.

RESULTS

Charlie, the cat, had a weight of 3.25 kg, a body temperature of 39.6°C, and skin turgor of less than 2 seconds at the time of examination. The oral examination revealed stomatitis, halitosis, and hypersalivation. Other clinical findings from the physical examination, including inspection and palpation, showed a mass on the left mandibular gum. Based on the anamnesis and physical examination, further tests were conducted to confirm the diagnosis.

The physical examination results indicated symptoms of stomatitis, halitosis, and hypersalivation. However, the cat's overall condition remained good, with active responses, normal feces, and a good appetite and thirst. These clinical findings are consistent with Carmichael's (2011) report, which states that common symptoms in such cases include halitosis, oral pain, and hypersalivation. According to Levy et al. (2015), although a normal body temperature in cats is often considered to be up to 39.2°C, their research shows that the normal body temperature ranges from 36.7°C to 38.9°C. Based on the physical examination, there were indications of a tumor infection in the patient's oral cavity.

Table 1. Results of the Physical Examination of Charlie the Cat

Types of Examinations	Results	Normal Values
Temperature	39,6 °C	37,8 – 39,2 °C
Skin Turgor	< 2	< 2
Respiratory Rate	20 times per minute	25 -40 times per minute
Heart Rate	160 times per minute	140-210 times per minute
Oral Cavity Examination	Stomatitis, Halitosis, and Hypersalivation	-

Oral Mucosa	Pink	Pink
Pulse Rate	120 times per minute	110 – 120 times per minute
Tongue	Pink	Pink
Nose	Moisture	Clean

The supplementary examination conducted was cytology. Cytology, also known as exfoliative cytology, involves the examination of cells from tissues or body fluids to determine a diagnosis. The purpose of this examination is to detect specific pathological abnormalities, particularly those related to malignancy, and to identify cellular changes with a focus on cell quality. Exfoliative cytology methods can be applied to soft tissues in the oral cavity, such as the tongue and gingiva (Sabirin, 2015). This supplementary examination was performed after the tumor mass was removed.

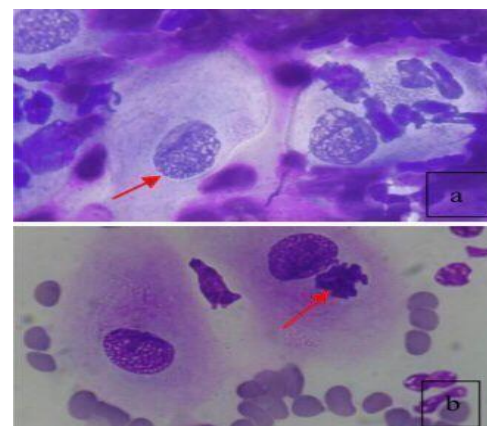


Figure 1. Cytology Interpretation. (a) Koilocytic Cell, (b) Emperipolesis

Based on the tissue examination results, the dominant cells observed were squamous cells with clearly visible nuclei, accompanied by halo bodies, which are characteristic of koilocytic cells in papilloma cases. Additionally, some cells exhibited emperipolesis, suggesting a possible diagnosis of Squamous Cell Carcinoma (SCC), as both types of tumors originate from the same cell lineage. This is consistent with the theory proposed by Sharun et al. (2020), which indicates that in some cases, koilocytic cells with clear perinuclear vacuolation are present, along

with numerous keratinocytes containing giant keratohyalin granules.

These characteristic histopathological findings suggest that the case is related to papillomatosis with a viral etiology. According to Gurgen et al. (2021), many koilocytic cells were observed with swollen nuclei and surrounded by clear halo bodies. Based on the histopathological results, this case can be diagnosed as severe oral papillomatosis that has progressed to oral Squamous Cell Carcinoma (SCC). Ferreira et al. (2015) describe emperipolesis as the process where intact hematopoietic cells, such as neutrophils, lymphocytes, and plasma cells, are phagocytosed by host cancer cells, and these cells are commonly found in SCC.

The therapy results indicate that tumor removal and antibiotic administration have a positive effect in accelerating recovery. However, regular check-ups must be closely monitored, and the surgical wound should be continuously observed to prevent secondary infections that could lead to new health issues.

DISCUSSION

Management of oral papillomatosis cases can be performed through surgery to remove the abnormal tissue growing in the oral cavity. Tumor removal is usually accompanied by the extraction of teeth around the tumor's growth area. This is consistent with the theory proposed by Diana et al. (2020), which states that surgical therapy can be used to remove tumors growing in the oral cavity. This surgical method also involves removing healthy tissue around the tumor to ensure that all infected tissue is completely excised.

Preoperative procedures include the placement of an intravenous infusion, patient sterilization, and the administration of anesthesia. Anesthesia is administered to relieve pain during the surgical process (Mangku & Senaphati, 2018). The premedication given to the patient is atropine sulfate, with a dosage of 450 mg

injected subcutaneously. The anesthesia used is a combination of ketamine and xylazine, with dosages of 500 mg of ketamine and 200 mg of xylazine. After the patient is unconscious, they are positioned on the operating table in lateral recumbency.

The surgical procedure was performed in the oral cavity. This surgery for oral papillomatosis is classified as a minor operation. The procedure began with exploring the oral cavity to locate the tumor. Once the tumor was identified, the teeth near the tumor mass were extracted. After the tooth extraction, the tumor was clamped to facilitate its removal using cautery. Once the tumor was successfully removed, it was placed in a sterile container, and the oral cavity was re-examined to ensure there was no bleeding. After confirming there was no bleeding, the oral cavity was flushed with NaCl to clean the area and prevent infection. The surgical procedure can be seen in Figure 2.



Figure 2. Surgical Procedure

Figure Description: a) Exploration of the oral cavity to locate the tumor. Once the tumor is identified, the teeth near the tumor mass are extracted, and the tumor is clamped using electrocautery. b) The removed tumor mass is placed in a container or on sterile materials, such as cotton and underpad. c) Flushing of the oral cavity is performed using sodium chloride (NaCl) to clean the area and prevent infection.

The surgical procedure for the oral papillomatosis tumor case proceeded smoothly, with no bleeding detected in the oral cavity. After the surgery was

completed, the patient was moved from the operating room to the recovery area and placed in a position to regain consciousness. According to Addie et al. (2003), the etiology of this condition is not specifically known, but it is likely a complex condition arising from reactions to multiple factors. It may begin with an environment in the oral cavity that supports bacterial growth, which is then responded to by the host and sometimes accompanied by viral infections that develop during the course of the illness.

Postoperative care aims to promote wound healing and reduce pain by managing the wound and improving dietary intake with high protein and vitamin content (Riyadi & Harmoko, 2012). Postoperative management for this case included administering medication twice daily and routine inspections of the surgical area. The goal of this care is to ensure that the patient recovers fully. When the owner requested outpatient care, the patient was allowed to go home by the veterinarian but was advised to continue taking the prescribed medication.

The therapy provided based on the diagnosis includes the removal of the tumor mass. Postoperative treatment for Charlie the cat involves administering antibiotics to combat bacteria, anti-inflammatories to reduce inflammation, and antifungals to stop tumor growth. Antibiotics may be synthetic or semisynthetic (Rahmawati, 2019). The postoperative management at the Yogyakarta Animal Clinic included the administration of Cefixime, Methylprednisolone, and Candistatin.

Cefixime is considered a bactericidal antibiotic and is relatively resistant to bacterial beta-lactamase. Its primary spectrum of activity is against gram-negative bacteria. Like other cephalosporins, Cefixime inhibits bacterial cell wall synthesis. Cefixime, a third-generation cephalosporin, is available in capsule form. The dosing regimen is 1 capsule twice daily, administered at 12:00

PM and 12:00 AM. As a third-generation cephalosporin, Cefixime has antimicrobial activity against both gram-positive and gram-negative bacteria. Oral administration achieves nearly 50% of the dose reaching bactericidal concentrations and penetrates tissues effectively (Sri Rezeki et al., 2001).

Methylprednisolone 4 mg is a generic medication used for anti-inflammatory therapy. It can treat infections in the oral cavity, allergies, release kinins from substrates, and aid in the formation of new scar tissue. This glucocorticoid steroid has been widely used to reduce various types of inflammation (Divyashree et al., 2016). Methylprednisolone as an anti-inflammatory is administered in a dose of 1/2 capsule, divided into 10 capsules. The dosing schedule is 1 capsule twice daily, at 12:00 PM and 12:00 AM. This medication is indicated for managing allergic conditions and reducing inflammation (Plumb, 2011).

Nystatin (Candistatin®) is an antifungal medication. Its mechanism of action involves binding to ergosterol in the fungal cell membrane. Candistatin is administered in a dosage of 0.2 cc, given twice daily at 12:00 PM and 12:00 AM. Candistatin drops are an antifungal medication that contains nystatin to treat candidiasis in the oral cavity. Nystatin belongs to the macrolide polyene antibiotic class, with fungicidal and fungistatic activity against sensitive organisms, including fungal species from the genera *Candida*, *Cryptococcus*, *Aspergillus*, *Histoplasma*, *Blastomyces*, and *Coccidioides* (Brescansin et al., 2013).

CONCLUSION

Based on the clinical signs and cytological examination results, it was concluded that Charlie the cat was affected by papilloma. The cytological interpretation revealed the presence of koilocytic cells, which are characteristic of papilloma, as well as emperipolesis, which is typically associated with squamous cell carcinoma

(SCC). Therefore, there is a possibility that this condition could develop into squamous cell carcinoma (SCC).

The management of oral papillomatosis in Charlie the cat involved the removal of the tumor mass and the extraction of teeth around the area of the mass. Postoperative treatment included Cefixime as an antibiotic, Methylprednisolone as an anti-inflammatory, and Candistatin as an antifungal.

The therapy results indicate that the removal of the tumor mass and the use of antibiotics had a positive effect on accelerating recovery. The postoperative wound has healed well.

REFERENCES

- Addie, D.D., Radford, A., Yam, P.S., & Taylor, D.J. (2003). Cessation of feline calicivirus shedding coincident with resolution of chronic gingivostomatitis in a cat. *Journal of Small Animal Practice*, 44, 172-176.
- Brescansin, G., et al. (2013). Physical and chemical analysis of commercial nystatin. *Acta Scientiarum*, 35(2), 215-221.
- Carmichael, D.T. (2011). *Veterinary Dentistry for the General Practitioner*. Saunders Elsevier.
- Diana, R.U., Fitri, W.A.M., Jhoni, V.A.R., & Febrianto, R. (2020). Gambaran sitologi squamous cell carcinoma pada kucing. *ARSHI*, 4(4), 61-62.
- Divyashree, K., Kumar, A.K., Sharma, G.K., & Semwal, A.D. (2016). Development and storage stability of buckwheat-chia seeds fortified biscuits. *International Journal of Food and Fermentation Technology*, 6(1), 103-110.
- Eldredge, D.M., Carlson, D.G., Carlson, L.D., & Giffin, J.M. (2008). *Cat Owner's Home Veterinary Handbook* (3rd ed.). New Jersey: Wiley Publishing.
- Fatma, A.P., Prihastuti, A.E., Yessica, R., Qisesa, I.B.G.R., & Fadli, M. (2021). *ARSHI Vet. Lett.*, 5(3), 45-46.
- Ferreira, R.C., Couto Junior, O.M., Carvalho, K.Q., Arroyo, P.A., & Barrosa, M.A.S.D. (2015). Effect of solution pH on the removal of paracetamol by activated carbon of dende coconut mesocarp. *Chemical and Biochemical Engineering Quarterly*, 29(1), 47-53.
- Gurgen, H.O., Egeden, E., & Sennazli, G. (2021). Clinicopathologic evaluation of oral squamous cell carcinoma in a young dog. *Ankara University Veterinary Faculty Journal*, 68(1), 77-81.
- Ibarra, M.A. (2018). Association between adiposity and lean mass with long-term cardiovascular events in patients with coronary artery disease: No paradox. *Journal of the American Heart Association (JAHA)*, 7(10).
- Lane, H.E., Weese, J.S., & Stull, J.W. (2017). Canine oral papillomavirus outbreak at a dog daycare facility. *Canadian Veterinary Journal (CVJ)*, 56(1), 747-749.
- Levy, J., Nutt, K., & Tucker, S. (2015). Reference interval for rectal temperature in healthy confined adult cats. *Journal of Feline Medicine and Surgery (JFMS)*.
- Mangku, G., & Senapathi, A. (2018). *Buku Ajar Ilmu Anestesia dan Reanimasi*. Jakarta.
- Munday, J.S., Sharp, C.R., & Beatty, J.A. (2019). Novel viruses: Update on the significance of papillomavirus infections in cats. *Journal of Feline Medicine and Surgery*, 21(1), 409-418.
- Munday, J.S., Thomson, N.A., & Luff, J.A. (2017). Papillomaviruses in dogs and cats. *The Veterinary Journal*, 225, 23-31.
- Riyadi, Sujono, & Harmoko. (2012). *Standard Operating Procedure dalam Praktik Keperawatan Dasar*. Yogyakarta: Pustaka Pelajar.
- Rodan, I., & Heath, S. (2015). *Feline Behavioral Health and Welfare*. Elsevier Health Sciences.
- Sabirin, I.P.R. (2015). Sipatologi eksfoliatif mukosa oral sebagai pemeriksaan penunjang di kedokteran gigi. *Journal Article Kedokteran dan Kesehatan*.

Sri Rezeki, H., et al. (2001). *Tatalaksana Demam Berdarah Dengue di Indonesia*. Jakarta: Departemen Kesehatan.

Sharun, K., Kalaiselvan, E., Sindhoora, K., Faslu, R.A.T., Khan, A., Pawde, A.M., & Amarpal. (2020). Oral papillomatosis in a dog: Surgical management and histopathological findings. *Advances in*

Animal and Veterinary Sciences, 8(4), 408-411.

Tuzio, H., Edwards, D., Elston, T., Jarboe, L., Kudrak, S., Richards, J., & Rodan, I. (2004). Feline zoonoses guidelines from the American Association of Feline Practitioners. *Journal of Feline Medicine and Surgery*, 7, 243-274.