

Case Report on Therapeutic Management of Canine Oral Papillomatosis

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Abstract

Canine papillomatosis is a frequently encountered viral infection in dogs, particularly in the younger age group. The condition is characterized by the presence of multiple benign epithelial tumours evident on the mucous membrane and skin. The causative agent is papillomavirus; a non-enveloped double-stranded DNA virus; to date, more than 50 genera, at least 318 types of papillomaviruses, affecting over 54 different animal species have been identified. A one-year-old non-descript intact bitch was presented to the Veterinary Clinical Complex, College of Veterinary and Animal Sciences, Pantnagar with the progressive development of multiple cauliflower-like outgrowths on the oral mucous membranes and tongue. Based on clinical examination and histopathology, the condition was diagnosed as canine papillomatosis. Treatment was carried out with injectable lithium antimony thiomalate, auto-haemotherapy, Thuja (homeopathic drug), and topically with zinc oxide ointment which proved to be effective after a few consecutive treatments. This article describes the haematological and histopathologic findings of canine oral papillomatosis and its therapeutic management.

Keywords: Auto Haemotherapy, Canine, Histopathology, Warts, Zinc Oxide,

Introduction

Papilloma or warts in canines are epithelial tumorous outgrowths on the skin and mucosa developed as a result of infection with Canine Papillomaviruses (Bianchi *et al.*, 2012). The causative agent is a double-stranded, non-enveloped DNA virus that is usually species-specific and has a strong tropism for cutaneous squamous or mucosal epithelium (Gross *et al.*, 2005). Canine papillomaviruses have been classified into (CPVs) three different genera in dogs—Lambda (types 1 and 6); Tau (types 2, 7, 13, 17, and 19); and Chi (types 3, 4, 5, 8, 9, 10, 11, 12, 14, 15, 16, and 20) genera. CPV1 along with CPV-13 is frequently responsible for oral papillomas in young immunosuppressed dogs (Williams *et al.*, 2021 and Chang *et al.*, 2020). In natural and experimental infections, papilloma viruses may cause a wide range of skin lesions including epidermal hyperplasia, epidermal cysts, squamous papilloma, fibro papilloma, inverted papilloma, basal cell epithelioma, and squamous cell carcinomas. (Bregman *et al.*, 1987 and Kaldrymidou *et al.*, 2001).

Currently, there are six recognized syndromes related to canine papilloma: oral papillomatosis, cutaneous, inverted cutaneous, multiple pigmented cutaneous, multiple pigmented plaques, and cushions multiple papillomas (Scott *et al.*, 2001). Prevalence studies suggest that the virus commonly affects dogs of younger age groups approximately around 1 year of age, with no gender and breed predisposition. Warts are generally evident on oral mucous membranes in dogs less than 2 years of age and in the skin in older dogs (Sundberg *et al.*, 1994). Overall, lesions are evident in the buccal mucosa, tongue, pharynx around the eyes and less commonly on other surfaces of the body (Khan *et al.*, 2020; Head *et al.*, 2002 and Sundberg *et al.*, 1994). Papillomaviruses in different species produce benign proliferating skin lesions, such as warts, pigmented/viral plaques, and papillomas (Araldi *et al.*, 2017). Viral warts are seen with a fissured irregular appearance which often resembles the surface of a cauliflower, which may be seen as sessile or pedunculated and when traumatized often bleed. They are generally seen as multiple in number, rather than as a solitary outgrowth (Vail and Withrow, 2007). Immunosuppression has been suggested as a risk factor for developing papillomatosis in dogs (Shah and Howley, 1996). Infection can be transmitted by direct contact with the papilloma(s) of an infected dog or contact with the virus in the environment having an incubation period of 30 days (Vail and Withrow, 2007). Infection is established as a result of viral exposure to micro-abrasions accessing the basal layer of the epithelium (Gross *et al.*, 2005). Transformation and multiplication of basal cells as a result of papilloma viral replication causes a hyperplastic reaction of the epithelium leading to warty growths. Most warts are benign and rarely proliferate indefinitely (Sundberg *et al.*, 1994 and Gross *et al.*, 2005). Canine papillomatosis is characterized by high morbidity and low mortality with a good prognosis, and the animal stays immune for the rest of its life (Raj *et al.*, 2020).

Case Presentation

A one-year-old non-descript intact bitch was presented for veterinary attention to the Veterinary Clinical Complex of G.B. Pant University of Agriculture and Technology, Pantnagar on developing multiple, well-circumscribed, firm, raised, cauliflower-shaped masses around its buccal mucosa and on the tongue. It was reported that the lesions appeared three months back and progressively increased in both number and size over time to an extent of trouble in feeding. The clinical history revealed that the animal previously had contact with another dog having similar types of lesions. On physical examination, papillomatous warts of greyish colour were seen on buccal mucosa and gingiva (Fig. 1). Otherwise, the bitch was apparently healthy with normal vital signs. Based on clinical examination, it was clinically diagnosed as a case of oral papillomatosis.

Blood samples were collected in EDTA solution containing vacutainer (1.8mg/ml blood) for haematology. Incisional biopsy was performed and 3-5mm tissue pieces were collected from the lesion concerned in 10% buffered formalin for determining histopathological alterations. The section was subsequently processed by the paraffin embedding technique as described by Luna, 1968. The histopathological technique involved fixation, washing, dehydration, clearing, embedding, section cutting, staining, and microscopical examination. Briefly, the tissue samples were washed in running tap water overnight to remove formalin, processed in ascending grades of alcohol for dehydration, and cleared in xylene, infiltrated, and embedded in paraffin. The paraffin-embedded tissues were cut into 3–4-micron thick sections using an automated microtome and stained with Haematoxylin and Eosin as per the procedure of Luna (1968).

Complete blood count revealed 12.4g% haemoglobin and, TLC of 13700/cumm. The differential count showed 43

% neutrophils, 5% eosinophils, 0% basophils, 45% lymphocytes, and 2% monocytes indicated neutropenia and lymphocytosis. Histopathological examinations revealed finger-like projections covered with keratinizing squamous epithelium around a fibrovascular central core. Numerous mitotic figures with multiple nuclei are seen in epidermal cells (Fig.2).

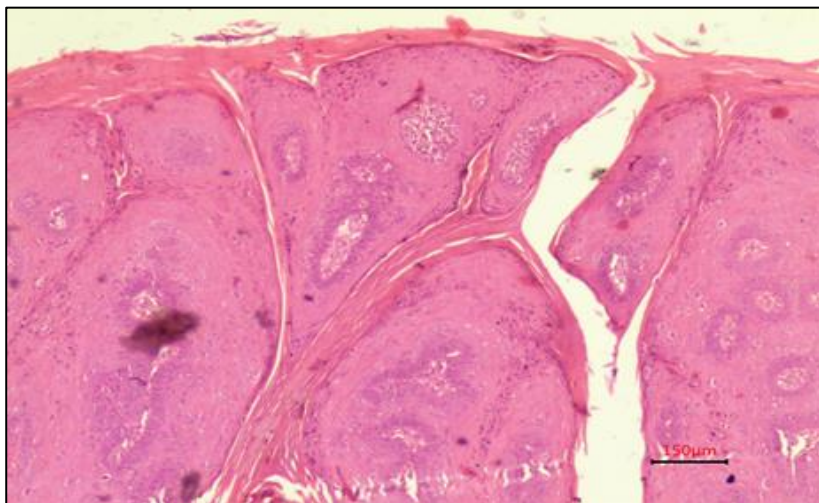


Fig (2). squamous papilloma- proliferation of keratinized squamous epithelium with fibro vascular connective tissue central core

Treatment

Treatment was initiated at Veterinary Clinical Complex with an intramuscular injection of 22.75 mg Pheniramine maleate (Avinil Vet®) at once to prevent any untoward reactions, followed by administration of 60 mg lithium antimony thiomalate (Anthiomalin®) deep intramuscularly twice in a week with a total of six doses. Auto-haemo therapy was performed where 3ml of blood drawn from the cephalic vein from the same animal was injected into the neck muscles once weekly for 3 occasions. Homeopathic drug *Thuja occidentalis* 30C (Dr. Reckeweg Thuja Occidentalis Dilution 30C, 200C) was administered as 2-3 drops orally twice daily for 15 days. Topical application of 15% Zinc oxide ointment was advised twice daily for four weeks.

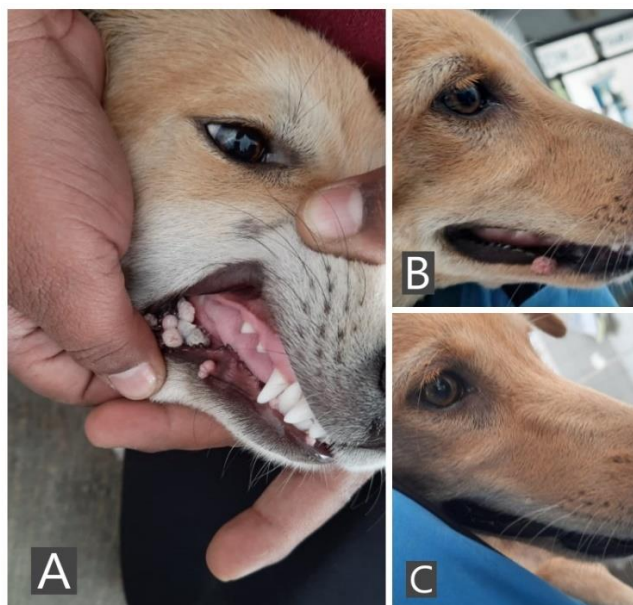


Fig (1). Warts on buccal mucosa on the first day of presentation (A), Reduction of warts after two weeks of therapy (B) and complete recovery after treatment (C)

Conclusion

Oral papillomatosis is a fairly common self-limiting disease affecting younger dogs without any predisposition to breed or sex. The case was chronically presented with the development of warty lesions on the buccal mucosa, gingiva, and tongue. The confirmative diagnosis was made based on gross lesions, haematology, and histopathological findings. The tumour tissue is composed of the hyperplastic epidermis with irregular inconspicuous dermal stalks. The case resulted in a complete resolution after initiation of a combined form of therapy with lithium antimony thiomalate, autochemotherapy, Thuja 30C orally, and topical application of 15% zinc oxide ointment over a period of four weeks. *Thuja occidentalis* is a medicinal herb that has been historically used for the management of various conditions. In folk medicine, extract from the dried twig tips has been used to treat bronchial catarrh, enuresis, cystitis, psoriasis, uterine carcinomas, amenorrhea, and rheumatism. The pharmacological potential of *T. occidentalis* has been ascribed to its various chemical constituents namely dextro-pinene, dextro- thujone, thujine, laevo-fenchone, and pinpieren which on administration showed a significant increase in interleukin 1, interleukin 6, and tumour necrosis factor alpha and caused local activation of cytokine-producing cells for priming without a systemic rise. It also causes T Helper-cell induction with increased production of Interleukin 2 (Bodinet *et al.*, 2002, Gohla *et al.*, 1989 and Joseph *et al.*, 2013). A variety of other techniques have been reported for the removal of the lesions like cryotherapy, surgical excision, cauterization, administration of local anesthesia, autologous or heterologous vaccination or use of immunomodulators for non-specific stimulation of the immune system (Bajric *et al.*, 1983; Amin *et al.*, 1997; Silva *et al.*, 1998 and Richman *et al.*, 2017). Autologous chemotherapy is one of the techniques used which has proved to be effective against a variety of pathological conditions; it involves collecting about 3-5ml of whole blood from the affected animal and administering immediately through intra-muscular, sub-cutaneous, intra-venous, or intradermal routes (Borges *et al.*, 2017 and Mettenleiter, 1936). Elemental zinc plays an essential role in the modulation of the immune system as it is found that zinc helps in the functioning of macrophages and neutrophils, natural killer cells, and various inflammatory cytokines. Zinc also directly regulates the interaction between host cells and viral components. Hence it has been taken into consideration as a form of immunotherapy in the treatment of viral warts and as adjunctive therapy to enhance the efficacy of other treatments. (Gupta *et al.*, 2014; Lazarczyk and Favre, 2008 and Songsantiphap and Asawanonda, 2019).

Conflict of Interests

There is no conflict of interest.

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