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Electrosurgical management and clinical outcome of extensive multicentric canine papillomatosis: A case report

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ABSTRACT

A seven-year-old female dog weighing 22 kg was presented at TVCC, Durg, with growths in lip margin, hard palate, tongue, ventral abdomen, inguinal region and digital webbing. Clinical examination under anaesthesia revealed a prominent verrucous mass adhering across the hard palate along with a cauliflower-like mass at the labial margin and inguinal fold and multiple nodular growths over the paws and abdomen. Haematological parameters remained within physiological limits. Diagnosis was established based on the characteristic gross appearance, histopathology and clinical distribution of the lesions. Due to continuous mechanical abrasion, high vascularity and masticatory interference, complete surgical excision and ablation were performed entirely using electrocautery under xylazine-ketamine general anaesthesia. Primary surgical wounds healed by first intention within ten days and secondary mucosal beds completed re-epithelialisation within three weeks. This report details the clinical presentation, electrosurgical management and therapeutic outcome of widespread viral papillomatosis in an adult canine patient.

Keywords: Canine papillomatosis, Electrocautery, Surgical ablation, Cutaneous warts

Introduction

Papillomaviruses are double-stranded DNA viruses that exhibit a marked tropism for stratified squamous cells, specifically infecting cutaneous skin and mucosal linings (Gross *et al.*, 2008) [1]. Papillomaviruses induce localized, proliferative cutaneous and mucocutaneous lesions across various animal species (Araldi *et al.*, 2017) [2]. These viral growths characteristically present with an irregular, fissured surface architecture strongly resembling cauliflower florets. Morphologically, the lesions manifest as either sessile plaques or pedunculated nodules, both of which are prone to haemorrhage following mechanical trauma or friction. Although oral and cutaneous papillomas commonly manifest as self-limiting lesions in young pups, generalized presentations spanning the trunk, extremities and oral cavity can develop in adult dogs. Papillomas typically present as firm, irregular, exophytic, pedunculated or sessile growths with a characteristic cauliflower-like architecture (Hnilicia *et al.*, 2017) [3]. Canine oral papillomatosis is characteristically self-limiting due to host cell-mediated immune responses that can take up to 12 months to develop (Sancak *et al.*, 2015) [4], prompt surgical intervention is frequently warranted as it provides immediate lesion clearance and consistently outperforms non-invasive modalities. Management of canine neoplasms encompasses multimodal therapeutic strategies, including radical surgical resection, antineoplastic chemotherapy, radiation therapy and targeted immunotherapy (Sharun *et al.*, 2019) [5]. The electrocautery technique provides immediate haemostasis, prevents intraoperative haemorrhage at delicate mucosal structures like the hard palate and ensures rapid postoperative recovery with low risk of local recurrence (Sharun *et al.*, 2020) [6].

Case history and clinical examination

A seven-year-old female dog weighing 22 kg was presented at TVCC, Durg with a six-month history of progressively enlarging, multiple nodular masses across several anatomical locations. Physical examination under sedation revealed a massive, confluent, pale pink cauliflower-like vegetative growth covering the caudal hard palate and occupying a large portion of the oral roof, alongside distinct growths on the upper labial border, ventral abdomen, interdigital webbing of the paws, and the right inguinal skin fold, where a prominent, pink, pendulous outgrowth hung between the abdominal wall and the medial thigh. The lesions on the paw and inguinal region exhibited focal surface ulceration and haemorrhage from locomotion and recumbency. Examination in lateral recumbency under general anaesthesia clearly displayed these widespread cutaneous

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nodular growths and prominent pendulous masses across the body (Figure 1), with detailed inspection of the head region demonstrating extensive cauliflower-like proliferative papillomatous growths (Figure 2). A ventral view further highlighted the large, pendulous mass originating from the right inguinal fold alongside multiple nodules across the ventral abdomen (Figure 3), which were subsequently isolated within the surgical field prior to electrosurgical resection (Figure 4).

Pre-operative clinical evaluation revealed normal baseline physiological parameters, including a rectal temperature of 38.6 °C (101.5 °F), a heart rate of 108 beats per minute (bpm) with strong, synchronous femoral pulses and a resting respiration rate of 18 breaths per minute (bpm). Pre-operative haematological analysis revealed a haemoglobin level of 12.2 g/dL, an erythrocyte count of $6.1 \times 10^{12}/L$ and a total leukocyte count of $14.5 \times 10^9/L$ with 68% neutrophils, 24% lymphocytes, 5% monocytes and 3% eosinophils. Serum biochemical evaluations of renal and hepatic function were within physiological reference intervals.

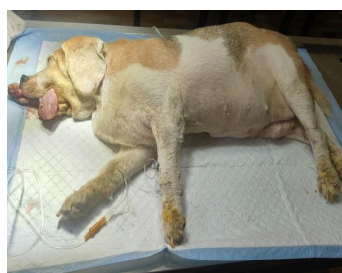


Figure 1. Lateral recumbency of the patient under general anaesthesia, displaying widespread cutaneous nodular growths and prominent pendulous masses.



Figure 2. Head region showing extensive cauliflower-like proliferative papillomatous growths.



Figure 3. Ventral view of the patient showing a large, cauliflower-like mass arising from the right inguinal skin fold alongside nodular growths across the ventral abdomen.



Figure 4. Surgical field isolating the inguinal mass and surrounding cutaneous nodules prior to electrosurgical resection.

Treatment and discussion

Anaesthesia was achieved with intramuscular premedication using atropine sulphate at 0.04 mg/kg BW and xylazine hydrochloride at 1 mg/kg BW, followed by intravenous ketamine hydrochloride at 5 mg/kg BW for induction and maintenance of surgical anaesthesia. Throughout the surgical procedure, vital physiological parameters were continuously monitored. Following induction and stabilization, intraoperative parameters remained stable: heart rate was maintained

between 80 and 110 bpm, respiration rate ranged between 12 and 14 breaths per minute and core body temperature was sustained between 99.5 °F–100.2 °F.

After standard surgical scrub preparation, electrocautery was employed as the sole surgical modality to achieve clean excision with instantaneous haemostasis. The pendulous inguinal mass was excised at its base with 2 mm gross margins, and the resulting skin defect was apposed primarily with silk using a simple interrupted suture pattern, as demonstrated by the immediate post-operative appearance of the inguinal excision site (Figure 5). The extensive labial margin mass was systematically resected and debulked down to the submucosal layer using the electrocautery blade, followed by direct fulguration of the base to eliminate residual viral margins (Figure 6). Smaller nodular growths on the ventral abdomen and digital webbing were simultaneously excised and ablated using the electrocautery tip.

Following surgery, an antiseptic dressing was applied to the operative site using liquid povidone-iodine (Betadine), complemented by the daily topical application of mupirocin ointment over the wound beds for 10 consecutive days. Systemic post-operative care comprised intramuscular injections of ceftriaxone at 5–10 mg/kg once daily for seven days, oral meloxicam at 0.2 mg/kg once daily for four days and regular oral lavages with 0.12% chlorhexidine gluconate solution. To prevent self-mutilation and mechanical interference with the healing tissue, an Elizabethan collar was fitted on the patient. The cutaneous sutures at the inguinal site were taken out on post-operative day 10, demonstrating primary wound closure with healthy margins, whereas the electrosurgically ablated palatine, mucosal and interdigital lesions achieved full re-epithelialisation within 21 days.

Macroscopic inspection of the resected tissue revealed multiple lobulated, firm, pale pink to fleshy-tan masses ranging from small 0.5 cm nodules to a large cohesive tissue mass exceeding 5 cm in length, all presenting classic outward papillary projections with a cobblestone or cauliflower-like surface configuration and focal dark haemorrhagic and necrotic zones resulting from pre-operative abrasion (Figure 7). Biopsy sections revealed hallmark features of viral-induced epithelial proliferation: diffuse epidermal hyperplasia, parakeratosis, marked rete peg extension and superficial dermal angiogenesis. The presence of koilocytes and coarse keratohyalin clumping within the stratum spinosum and granulosum substantiated an active papillomaviral infection. Together, the macroscopic appearance and histopathological profile established the diagnosis of canine oral papillomatosis.



Figure 5. Immediate post-operative appearance of the inguinal excision site.



Figure 6. Intraoral view showing the excision site on the rostral upper lip after electrosurgical removal of a papilloma, alongside an extensive cauliflower-like mass on the caudal hard palate.

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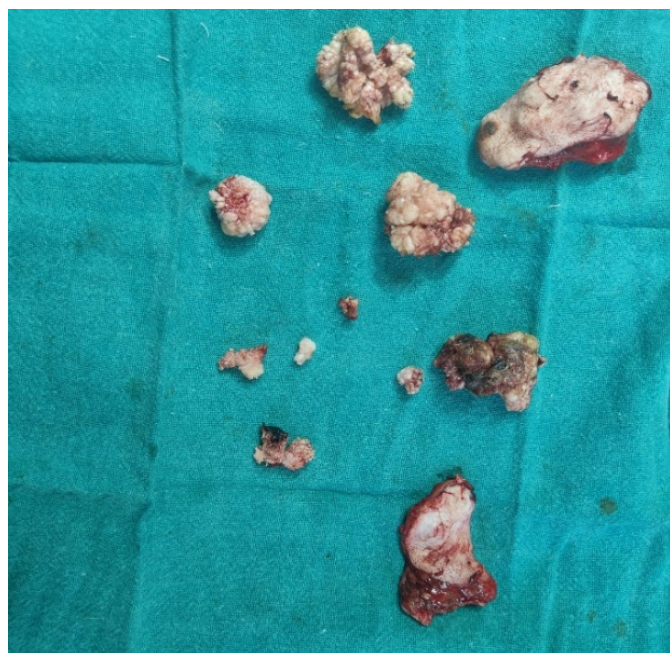


Figure 7. Gross pathological specimens of the resected tissue, displaying multiple lobulated, firm masses with characteristic outward cauliflower-like papillary architecture.

While typically distributed over the face, ears and limbs, exophytic viral papillomas frequently involve mucocutaneous junctions as well (Gross *et al.*, 2008) [1]. Bianchi *et al.* (2012) [7] evaluated 24 canine papilloma cases and determined that lesions predominantly occur in young dogs (mean age 3.1 years), presenting mostly as cutaneous exophytic growths. In a 6-month-old German Shepherd presenting with more than 35 lesions on the lips and oral cavity, it was found that combining surgical excision with electrocautery successfully eliminated the growths, achieved complete tissue healing within a week and remained recurrence-free throughout a 1-year monitoring period (Sharun *et al.*, 2020) [6]. Haruna *et al.* (2021) [8] investigated electrocauterization followed by systemic 5-fluorouracil chemotherapy, which led to complete clinical recovery within 3 weeks. Complete electrosurgical excision combined with thermal fulguration ensures bloodless dissection, clear operative visualization and thermal destruction of viral margins, representing an effective one-step intervention for extensive mucocutaneous canine papillomatosis.

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Conclusion

Successful management of generalized mucocutaneous papillomatosis in an adult canine was achieved in a single operative session using electrocautery under xylazine-ketamine anaesthesia.

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