

PATHOLOGICAL STUDIES OF PAPILOMA AND SQUAMOUS CELL CARCINOMA IN DOGS IN JAIPUR

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ABSTRACT

Skin is the outer most covering of the body and more prone to neoplasms due to constant exposure to tumour inducing etiological factors in the environment. Neoplasms of the skin are most common in dogs and can be diagnosed more frequently due to easily visible anatomical locations. In the present study, neoplasms of the skin were observed in 43 (17.34%) cases out of 248 cases of skin disorders in dogs. Squamous cell carcinoma and papilloma were reported in highest frequency among various neoplastic conditions of skin i.e. 7 (16.28%) and 6 (13.95%) cases respectively. Papilloma observed as 1-2 cm. wart or finger like growth with firm consistency, whereas squamous cell carcinoma revealed irregular masses with a broad base, firm in consistency and cauliflower like cut surface. Papillary projections, hyperkeratotic stratum corneum, proliferation of all layers of stratified squamous epithelium were characteristic microscopic findings in papilloma. Histopathological findings of squamous cell carcinoma were presence of concentrically arranged layers of epithelial cells in the form of cell nests with areas of keratin pearls.

Key words: Skin disorders, neoplasm, papilloma, squamous cell carcinoma

Introduction

Dogs have played an important role in the history of human civilization and were among the first domesticated animals. Dogs are living example of love and faith. Yet the role of pets in family systems and family therapy has received little attention in research, training, and practice. Therefore, it is our moral duty to ensure proper health and care to pet animals. Neoplasms of the skin are most common in dogs and can be diagnosed more frequently due to easily visible anatomical locations. Neoplasms of the skin constitute one third of the tumour processes in the dog and can be of benign or malignant type. Skin neoplasms have their origin in epithelial, mesenchymal, lymphohistiocytic and melanocytic cells or they can be metastases of neoplasms from other locations (Chavez *et al.*, 2020). Skin neoplasm holds a range from 9.5 percent to 51 percent among all tumors in dogs (Bronden *et al.*, 2010). Study of skin tumours imparts a major role in early diagnosis and prognosis which helps veterinarian to decide line of treatment (Palanivelu *et al.*, 2013). In this context, present study was carried out to find out incidence and pathology of various neoplastic conditions among various dermatological disorders of skin in dogs.

Materials and Methods

For the present investigation, representative neoplastic tissue samples were taken from clinical cases of surgically excised neoplasm from various private clinics situated in Jaipur, Government Veterinary Hospitals, NGO's (Help in Suffering) and Surgery section of Veterinary Clinical Complex of Post Graduate Institute of Veterinary Education and Research (PGIVER), Jaipur. The tissue samples of skin showing lesions were preserved in 10 per cent neutral buffered formalin after collection with all precautions. The histopathological examination was done after processing of tissue samples

mechanically for paraffin embedding by acetone and benzene technique (Culling, 1974; Lillie, 1965). The tissue sections of 4-6 micron thickness were cut using manual microtome and mounted over albuminized slide and stained with haematoxylin and eosin method of staining as a routine.

Result and Discussion

In the present study, papilloma and squamous cell carcinoma were reported in highest frequency among various neoplastic conditions of skin i.e. 6 (13.95%) and 7 (16.28%) cases respectively. The 13.95 per cent incidence of papilloma among various neoplastic conditions of skin, is quite higher than the incidence recorded by Gupta and Tiwari (2009), Chikweto *et al.* (2011), Bahal (2014), Graf *et al.* (2018), Khan (2019) and Kok *et al.* (2019). Almost similar incidence of papilloma i.e. 14.81 per cent was recorded by Dadhich (2004) was in close agreement with the incidence reported in the present study. Arya *et al.* (2018) recorded higher incidence of papilloma i.e. 42.86 per cent among the skin neoplasm in comparison to present study. The 16.28 per cent incidence of squamous cell carcinoma in the present study is quite higher than the incidence recorded by Dadhich (2004), Mukaratirwa *et al.* (2005), Gupta and Tiwari (2009), Chikweto *et al.* (2011), Sathiseelan *et al.* (2013), Bahal (2014), Graf *et al.* (2018), Hasiri *et al.* (2019), Kok *et al.* (2019) and Sharma *et al.* (2019), whereas Yumusak and Kutsal (2016) recorded higher incidence than the present study.

Papilloma observed as 1-2 cm. wart or finger like growth with firm consistency and white to grey in colour on gross examination. These gross findings of papilloma were also observed by Krithiga *et al.* (2005) and Jubb *et al.* (2007). Papilloma was characterized histopathologically by hyperplasia of the stratum spinosum cells, showing irregular hyperkeratinization and prominent intracytoplasmic

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keratohyaline granules. Variable degree of hyperkeratosis was shown by stratum corneum. Papillary projections, hyperkeratotic stratum corneum, proliferation of all layers of stratified squamous epithelium along with fibrovascular connective tissue core were observed (Fig. 1 and 2). Histopathologically, hyperplasia of the stratum spinosum cells and prominent

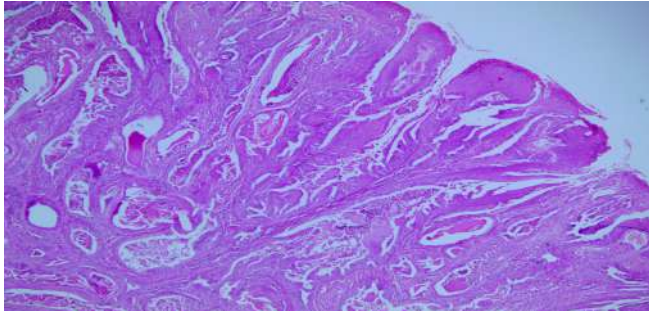


Figure 1: Microphotograph of papilloma showing papillary projections, hyperkeratosis, proliferation of layers and connective tissue core. H&E 40 X

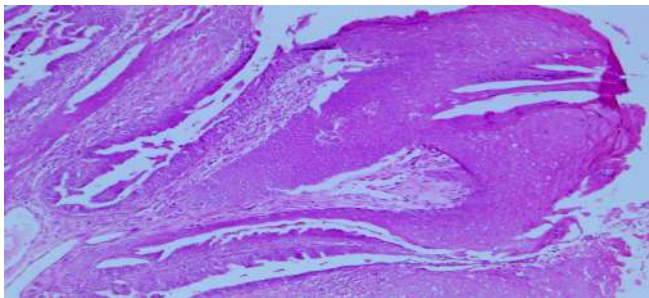


Figure 2: Microphotograph of papilloma showing papillary projections, hyperkeratosis, proliferation of layers and connective tissue core. H&E 100 X

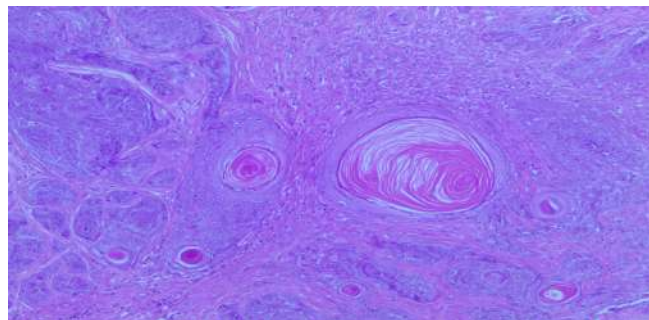


Figure 3: Microphotograph of squamous cell carcinoma showing keratin pearls with concentric layers. H&E 100 X

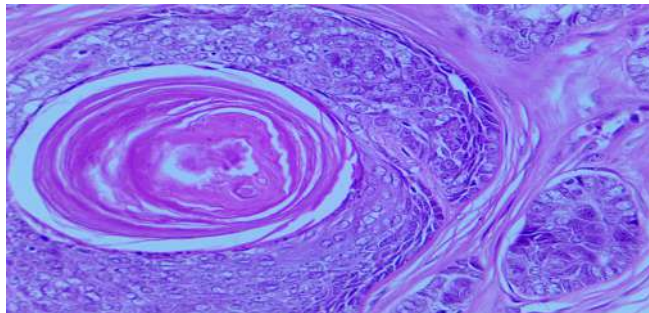


Figure 4: Microphotograph of squamous cell carcinoma showing concentric layers of keratin pearls and cell nests. H&E 400 X

intracytoplasmic keratohyaline granules in cases of papilloma were also described by Krithiga *et al.* (2005), Lane and Tubbesing (2007) and Karnik *et al.* (2020). Variable degree of hyperkeratosis in stratum corneum was observed in the present study, is in accordance with the findings of Jubb *et al.* (2007), Yumusak and Kutsal (2016) and Johnson and Myers (2017). Presence of papillary projections along with hyperkeratosis and fibrovascular connective tissue core are in close fit with the findings of Palanivelu *et al.* (2013).

Gross examination of squamous cell carcinoma revealed irregular masses with a broad base, firm in consistency and cauliflower like cut surface. These findings were also reported by Bostock (1986) and Chandrashekaraiiah *et al.* (2011) during their studies. Microscopic findings were presence of concentrically arranged layers of epithelial cells in the form of cell nests with areas of keratin pearls (Fig. 3). Cell nests formed by proliferating neoplastic cells which show immature polyhedral cells at the periphery and eosinophilic lamellated keratin pearls at the center. There was presence of neoplastic cells, infiltrating the dermis with keratin pearls. There was presence of thick cellular strands and irregular cords composed of concentric layers of neoplastic squamous epithelial cells forming keratin pearl and cell nests with keratinization towards the center (Fig. 4). Microscopically, presence of concentrically arranged layers of epithelial cells in the form of cell nests with areas of keratin pearls is in concurrence with findings of Bostock (1986), Krithiga *et al.* (2005), Sathiseelan *et al.* (2013), Bahal (2014), Yumusak and Kutsal (2016), Karnik *et al.* (2020) and Thakur *et al.* (2021). Presence of thick cellular strands and irregular cords composed of neoplastic squamous epithelial cells forming keratin pearl and cell nests with keratinization towards the center and immature polyhedral cells at the periphery was also elaborated by Reddy *et al.* (2009), Chandrashekaraiiah *et al.* (2011), Kashyap *et al.* (2013), Palanivelu *et al.* (2013) and Hasiri *et al.* (2019).

Conclusion

Papilloma and squamous cell carcinoma are very important and observed most frequently among various types of skin neoplasms reported in dogs in Jaipur.

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