

PATHOMORPHOLOGICAL AND IMMUNOHISTOCHEMICAL STUDY ON SEBACEOUS EPITHELIOMA IN A DALMATIAN DOG

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SUMMARY

A four year aged male Dalmatian dog was brought with the history of mass in the neck to Veterinary Clinical Complex (VCC). Clinical evaluation revealed a palpable hard mass on the right lateral aspect of neck. Histologically, the tumour mass composed of reserve cells with admixture of single to cluster of mature sebocytes. Sebaceous duct like structure were irregularly distributed and lined by squamous epithelial cells. The basal cells showed numerous mitotic figures. Immunohistochemically, Ki 67 positive reactions are observed mostly on the reserve cells than intermediate cells. Based on histopathological and immunohistochemical examination, the case was confirmed as sebaceous epithelioma.

Keywords: Dog, Ki 67, Pathology, Sebaceous epithelioma

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Sebaceous glands are found throughout the skin, although they are particularly abundant around the paws, back of the neck, croup, chin and tail. In dogs, Sebaceous gland tumours account for 21 to 35 per cent of all cutaneous epithelial tumours and putting them as the third most common type of cutaneous tumour (Vail and Withrow, 2007). They are mostly observed on the head, ears and dorsum. Based on histological features they are classified as adenoma, ductal adenoma, epithelioma and adenocarcinoma (Goldschmidt *et al.*, 1998). However, in humans the true sebaceous neoplasms are rare, especially in sun exposed skin and are often misdiagnosed as basal cell carcinoma and squamous cell carcinoma (Flux, 2017).

The most common histological type of sebaceous tumour is sebaceous adenoma, followed by sebaceous hyperplasia, then sebaceous carcinoma and sebaceous epithelioma in canines (Costa *et al.*, 2020; Patel *et al.*, 2019). The histopathological confirmation is difficult in case of carcinoma and sebaceous epithelioma because they contain more basaloid cells. It is mistaken for poorly differentiated squamous carcinomas and basal carcinomas. (Sabattini *et al.*, 2015). Therefore, supplementary immunohistochemistry may be needed for this diagnosis in both humans and dogs (Sabattini *et al.*, 2015; Yoon and Park, 2016). Hence the present case explains the pathomorphological and immunohistochemical features of sebaceous epithelioma in a Dalmatian dog.

A four year old male Dalmatian dog was brought to the VCC, VCRI, Namakkal, with the history of mass in the neck. On physical examination, a firm irregular mass was noticed on the right lateral neck region and other

physiological parameters were in the normal range. The tumour mass was surgically removed and fixed in 10 per cent neutral buffered formalin. The formalin fixed tumour sample was processed, paraffin embedded tissue sections were cut into 4 µm thickness and stained with Haematoxylin and Eosin. Another set of tissue sections were taken on poly L lysine coated slides and subjected to Ki 67 staining.

On gross examination, the tumour mass was firm in consistency, about 3×5 cm in size and the cut surface was gray in colour (Fig.1). Microscopically, the tumour consisted of irregular lobules of reserve cells with admixture of single to cluster of mature sebocytes, intermediate cells and surrounded by irregular stroma. Sebaceous duct like structure were irregularly distributed in the tumour and which was lined by squamous epithelial cells. (Fig. 2). The basaloid cells and mature sebocytes were unevenly distributed from field to field. The nuclei of reserve cells were round to oval, vesicular, hyperchromatic and contained multiple nucleoli. The mitotic index was 25. The mitotic activity was more in the reserve cells followed by intermediate cells and mature sebocytes (Fig. 3). The Ki 67 activity was 12 per cent. The immunoreactivity for Ki 67 was observed on the nucleus of reserve cell population (Fig.4).

The histological features together with immuno-histochemical staining characteristics were consistent with diagnosis of sebaceous epithelioma in the present case. Sebaceous epitheliomas are common neoplasm of dogs, arising from the reserve cells of sebaceous glands. (Gross *et al.*, 2005). However, the immunohistochemical characterization of sebaceous epithelioma is rarely reported in dogs (Yoon and Park, 2016). This study investigated immunohistochemical features of sebaceous

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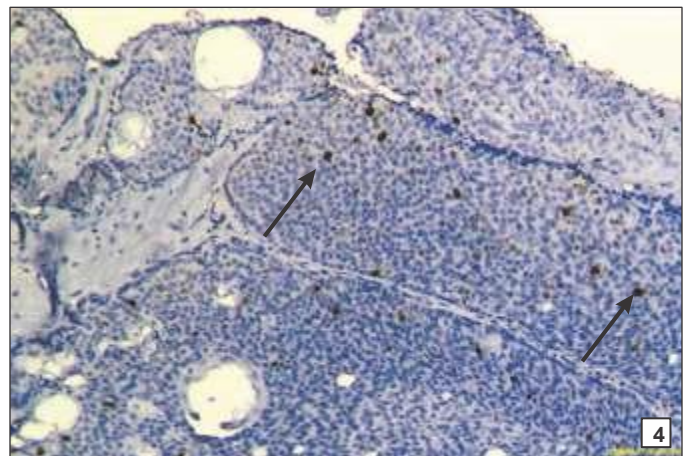
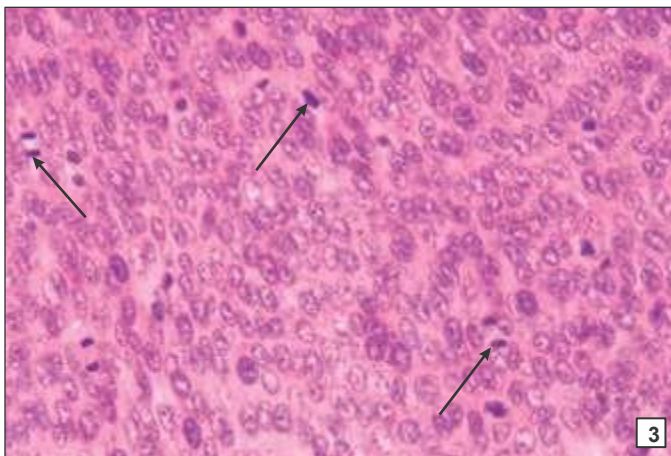
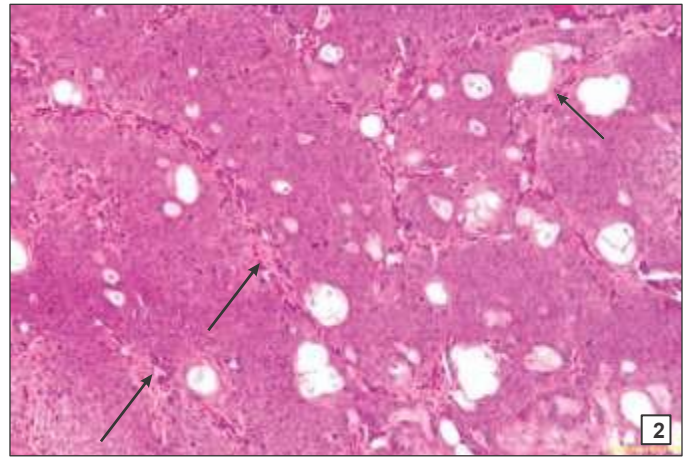


Fig. 1-4. (1) Irregular firm tumour mass. (2) Sebaceous epithelioma showing solid growth of basaloid cells which is separated by thin fibrous stroma (arrow) into lobules and scattered well differentiated individual sebocytes. H&E×100. (3) Mitotic figures (arrow) in the basaloid cell population. H&E×400. (4) Cell proliferation index by Ki67 immunohistochemistry showing positive reaction (arrow) in the nucleus of reserve cell population. IHC×100

epithelioma using Ki-67. Generally sebaceous epithelioma is a benign tumour, most likely to recur after surgical excision and rarely metastases observed in the regional lymph node and other visceral organs (Scott and Anderson, 1990). However, an occasionally aggressive behaviour, metastasizes to regional lymph nodes and distant organs were reported in dogs (Bettini *et al.*, 2009). But in the present case, radiographical examination revealed no metastases in the lungs and also local recurrence was not reported.

Diagnosis of sebaceous adenoma from carcinoma is not difficult by histologically, but it is difficult to distinguish between tumours with more reserve cell population (Sabattini *et al.*, 2015). As per Gross *et al.* (2005) tumours containing more than 90 per cent of reserve cells are categorized as sebaceous epitheliomas. In the present case the tumour mass contained more than 90 percent of reserve cells. The benign sebaceous tumours may be differentiated from malignant sebaceous neoplasms by proliferation markers (Gross *et al.*, 2005). The ki 67 index of the case was 12 which are somewhat lesser than for sebaceous epithelioma with metastasis in canines and sebaceous carcinoma in humans (Ansai *et al.*, 2011). This low level of mitotic

activity reflects no metastases and good prognosis in the present case. The higher Ki67 index in the metastatic/local recurrence sebaceous tumours is evidencing the prognostic potential of Ki 67 (Sabattini *et al.*, 2015). In some studies PCNA also used to assess the proliferation potential of sebaceous tumours in dogs (Costa *et al.*, 2020). The mitotic index and Ki67 index were showed positive correlation, in such case the proliferation marker evaluation may not add any additional information when compare to the less expensive and quicker mitotic count. (Sabattini *et al.*, 2015). A comprehensive retrospective study assessing proliferation markers in sebaceous epithelioma will be beneficial in determining the histological criteria for low to high grade differentiation and in assessing the prognosis of patients. Based on the histo-immunohistochemical characteristics this tumour was confirmed as sebaceous epithelioma in a dog.

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