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MIXED APOCRINE GLAND TUMOUR IN A GERMAN SHEPHERD DOG

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ABSTRCT
This report describes the gross and histopathological features of a solitary mass resected out from the left perineal region from an 11 year- old German Shepherd intact dog. The mass (7-7.5 cm in diameter) was difficult to transect and the cut surfaces revealed dense white gritty areas at many places. Microscopic examination of the tumour mass revealed proliferating epithelial cells forming papillary projections and at some places, with tendency to form acini separated by thin connective tissue stroma. The neoplastic cells showed pleomorphism, nuclear hyperchromasia with prominent nucleoli, mitotic figures and moderate amount of eosinophilic cytoplasm. Based on the presence of intracytoplasmic PAS-positive, diastase resistant granules within the glandular epithelial cells and the intracellular iron positive granules, the neoplasm were considered to be of apocrine origin. Additionally, there was extensive proliferation of stromal elements, comprising of collagen rich fibro-vascular connective tissue admixed with cartilage and osteoid arranged as anastomosing trabeculae. The gross and histopathological features of the tumour were suggestive of mixed apocrine gland tumour.

KEYWORDS: Gross and histological features, mixed apocrine gland tumour, German Shepherd dog.

INTRODUCTION

Apocrine sweat gland adenocarcinomas (AAC) are the most uncommon growths arising from the glandular or ductular components of sweat glands and account for only 0.7 – 2.2% of all skin associated neoplasms in canines.[1,2,3] AAC's are classified according to the WHO International histological classification of tumours of domestic animals into following types: solid, tubular, papillary (cystic) and ductal AAC's. Based on metaplasia or malignancy of myoepithelial components of the tumours, these main types are subdivided into complex AAC, mixed or carcinosarcoma.[4] Among the various types of the malignant apocrine tumour, mixed AAC's is the least common type and accounts for only 0.1% of the neoplastic conditions of the skin, subcutaneous tissue and adnexa in dogs.[5] Although AAC have no breed predisposition, however German Shepherd appears to be one of the predisposed breed.[6] There is a certain predisposition by gender, with male being more affected than females. Amongst the males, higher incidence of AAC has been recorded in intact dogs than neutered animals.[7] The present communication describes the gross and histopathological features of mixed apocrine gland adenocarcinoma in a male German Shepherd dog.

CASE REPORT

The tumour under report was a solitary mass resected out from the left perineal region from an 11 year- old German shepherd intact dog. The tumour mass was globular in shape, 7-7.5 cm in diameter transversally and weighed 120 gm. The growth was firm in consistency at most of the places with a soft central portion. The mass was difficult to transect and the cut surfaces revealed dense white gritty areas at many places. Representative specimens from different areas of the tumour mass were fixed in 10% neutral buffered formalin. The tissue samples were processed for routine histopathological studies employing paraffin embedding and 3-5 µm thick sections were stained with Hematoxylin and Eosin, Periodic acid schiff (PAS) with and without diastase, Masson's trichrome (MST), Von kossa's, Perl's Prussian blue method and Lendrum's method as per the standard procedure.[8]

Microscopic examination of the tumour mass revealed proliferating epithelial cells forming papillary projections (Fig. 1) and at some places, a tendency for acinar pattern separated by thin connective tissue stroma was evident. Cellular pleomorphism, nuclear hyperchromasia with prominent nucleoli and varying degree of mitosis were

also noticed. Most of the well differentiated as well as anaplastic epithelial cells were found to be PAS-positive and diastase resistant indicating the apocrine nature of the cells. Lendrum positive intranuclear inclusions were noticed in few proliferating cells (Fig. 2). Moderate amount of haemosiderin pigments were noticed in areas with extensive haemorrhages. In addition, there was extensive proliferation of stromal elements, comprising of collagen rich fibro-vascular connective tissue admixed with cartilage and osteoid arranged as anastomosing trabeculae (Fig. 3, 4). Some of the trabeculae stained positive with Von kossa method indicating osseous metaplasia. The neoplastic mass showed areas of necrosis infiltrated prominently with polymorphs and also had haemorrhagic areas admixed with hemosiderin laden macrophages.

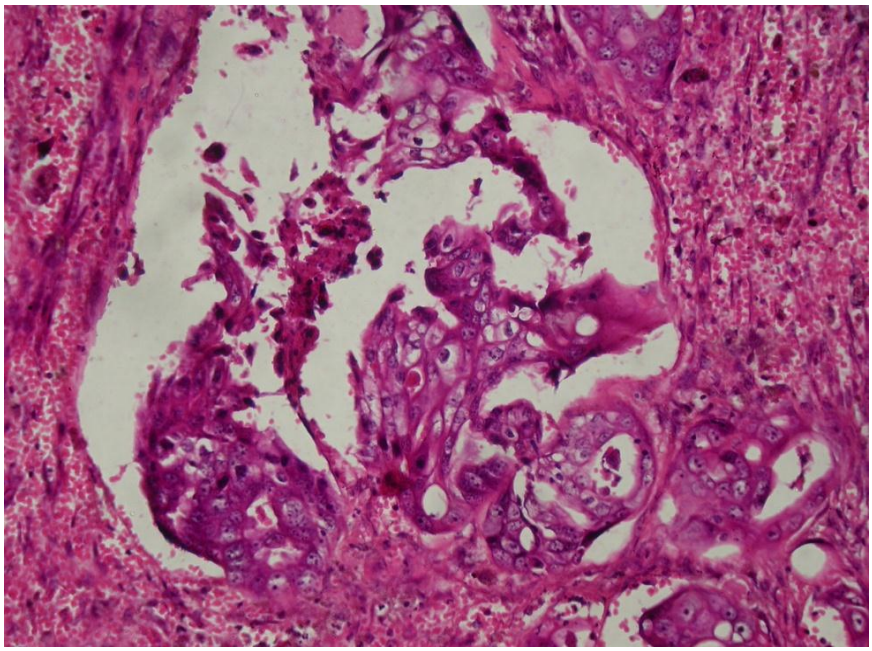

Figure1. Photomicrograph from the neoplastic growth showing glandular components amidst fibrovascular stroma and haemorrhages. (H & E x 100).

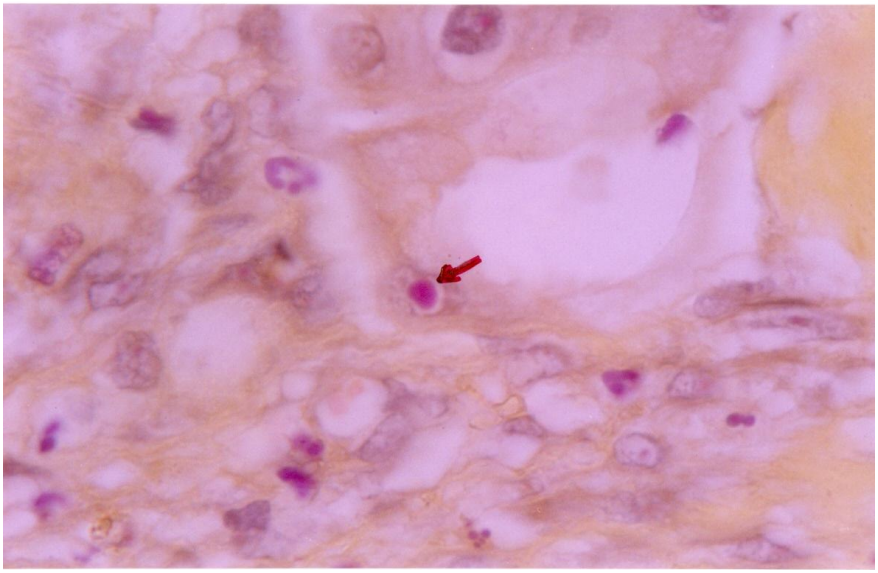

Figure 2. Photomicrograph from the neoplastic growth showing the presence of intra-nuclear inclusion body (arrow) within the glandular epithelium cells. (Lendrum's method x 1000)

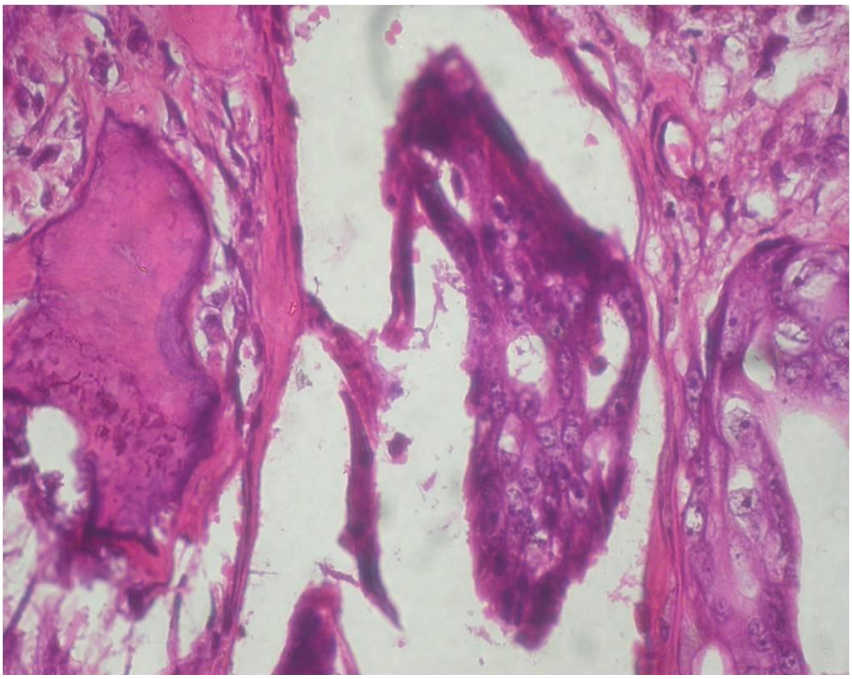

Figure 3. Photomicrograph from the neoplastic growth showing glandular pattern of cells and focal osseous metaplasia. (H & E x 200)

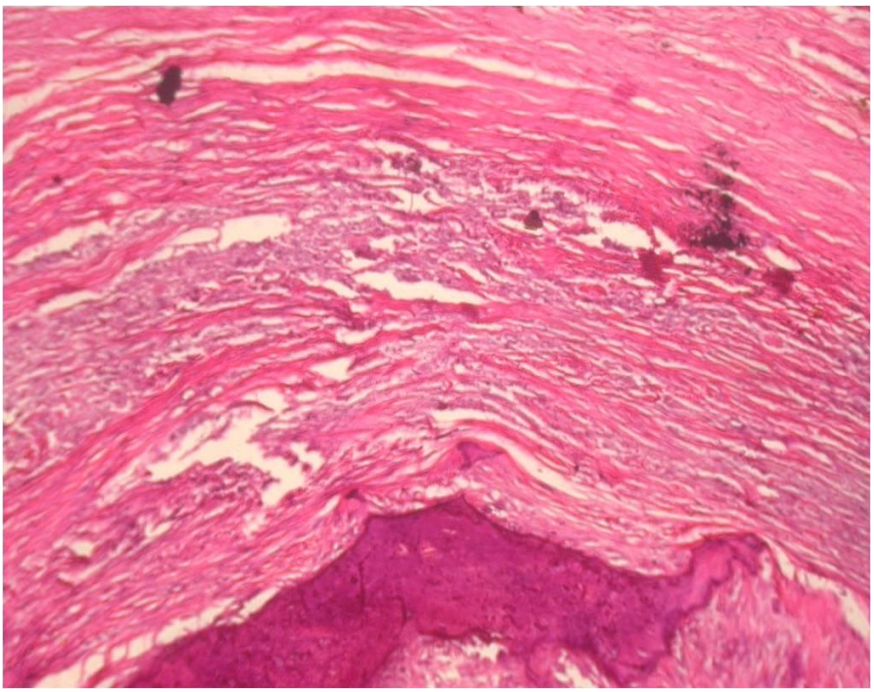

Figure 4. Photomicrograph from peripheral portion of neoplastic growth showing extensive proliferation of fibrous connective tissue along with osseous metaplasia. (H & E x 100)

DISCUSSION

Based on the presence of intracytoplasmic PAS-positive diastase resistant granules within the glandular epithelial cells and the intracellular iron positive granules, the neoplasm was considered to be of apocrine origin.[9] Moreover, the presence of osteoid formations among or near neoplastic epithelial cells warranted a diagnosis of malignant mixed tumor of apocrine gland. Apocrine gland tumours have no breed predilection in dogs [10]; however breeds that appear to be predisposed are old English Sheep dog, Shihtzu, German Shepherd, Cocker spaniel and Golden retriever.[1,6] The gender and age of the animal in the present case were consistent with the earlier reports on AAC.[11,7] AAC's can occur at any site with no predilection for specific areas, but perineum appears to be one of the common sites of occurrence in dogs.[2] AAC's are usually solitary (about 93% of cases), well circumscribed and firm to solid growth of 0.5-10 cm

diameter.[1] Mixed apocrine tumours resemble the mixed mammary tumours of dogs.[5] Cartilaginous and osseous metaplastic changes have been reported in mixed mammary tumours [7,12] and salivary gland tumours.[13] According to Gross *et al* [10], cartilaginous or osseous metaplasia is rarely observed in case of apocrine gland carcinoma. The origin of cartilage and bone in these glandular neoplasms is not fully understood. The role of myoepithelial cells or undifferentiated mesenchymal cells in the process of metaplastic differentiation into cartilage and subsequently to the bone in mixed mammary tumours has been considered.[7] The possibility of malignant transformation of myoepithelial cells leading to cartilaginous or osseous metaplasia of mixed apocrine gland carcinoma of eyelid has also been reported earlier.[14] Gulbahar *et al*. [15] suggested that osteoinductive stimulus produced by neoplastic cells acting on undifferentiated pleuripotent stem cells can cause their metaplastic transformation into osteoblast or chondroblast, which in turn can result into heterogenous histologic appearance of AAC. The role of parathyroid hormone related protein (PTHrP) from the tumour cells in cases of canine apocrine adenocarcinoma in the pathogenesis of malignancy associated hypercalcemia [16] can also be considered for the osseous metaplasia in mixed apocrine tumour. Most authors stated that apocrine gland carcinomas in dogs rarely metastasise[17,18,1], but there are a few reports on metastasis of this tumour to lymphnodes, viscera, bone and bone marrow.[7,19] In the present case, the evidence of distant metastasis could not be ascertained due to lack of follow-up information from the owner. In addition, finding of intranuclear inclusions within the neoplastic cells definitely warrants investigation in the field of etiology and origin of this neoplastic condition.

CONCLUSION

Based on the results of the gross, histopathological and histochemical studies on this tumor, this case was diagnosed as a malignant mixed apocrine gland tumor in a dog.

CONFLICT OF INTEREST

We declare no conflicts of interest.

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