Introduction

Pheochromocytomas are neuroendocrine tumours of adrenal chromaffin cells. This case reports the occurrence of a tan-coloured mass in medulla of the left adrenal gland in a 6-year-old female sheep dead from pneumonia. Histopathologically, the tumour was composed by pleomorphic cells with marked nuclei and abundant eosinophil cytoplasm. Immunohistochemistry evidenced expression of neuron specific enolase (NSE) and S100 protein in neoplastic cells associated with a strong Ki-67 activity. This tumour was diagnosed as pheochromocytoma. This is the first report of a pheochromocytoma in a sheep.

Case report

A 6-year-old, female, sheep that died from pneumonia was presented for necropsy to the department of pathology (Faculty of Veterinary Medicine, University of Mehmet Akif Ersoy, 15030-Ortulu, Burdur, TURKEY). At necropsy, slight enlargement was observed for the left adrenal gland. A tan-coloured mass (0.5 x 0.4 cm in diameter) was detected in the medulla of the left adrenal gland. Yellow-white areas were present across the cut surface (figure 1).

For histopathological examination, tissue samples were taken from the adrenal mass and other organs (heart, liver, kidney, lungs, stomachs, intestines, spleen and brain), fixed in 10% buffered formalin and processed routinely for light microscopy. Five micron thick sections were taken from paraffin embedded tissues and stained with Haematoxylin-Eosin. Selected sections from mass were stained by immunohistochemistry in order to demonstrate neuron specific enolase (NSE antibody; Abbiotec San Diego, CA, Catalog Number 251399), S100 protein (S-100 antibody; Abbiotec San Diego, CA, Catalog Number 251795) and Ki-67 (Ki-67 antibody; Abbiotec San Diego, CA, Catalog Number 250733) using a routine streptavidin-biotin peroxidase technique.

At histopathological examination, the medulla of adrenal gland was slightly expanded by a capsulated neoplasm composed of packets and cords of polygonal cells with distinct cell borders and abundant eosinophil cytoplasm with chromaffin granules. Nuclei were irregularly round and vesicular with indistinct nucleoli (figures 2 and 3). The mass exhibited altered architecture and variable compression of the surrounding parenchyma. Neoplastic cells were arranged in variably sized aggregates, clusters, and trabecular cords of varying thickness. Mitotic figures were rare. No metastases were seen in any organ. The cells were positive for NSE (figure 4), S100 and Ki-67 protein.

Discussion

Although pheochromocytomas are most commonly identified as incidental findings at necropsy, they may occasionally be...
PHEOCHROMOCYTOMA IN A SHEEP

associated with clinical signs due to the continuous or episodic secretion of one or more of the catecholamines: epinephrine, norepinephrine, or dopamine in dogs [1, 2, 4]. In the present case, the tumour was an incidental finding and no clinical signs were observed related to it. Pheochromocytomas are neuroendocrine tumours arising from the catecholamine-secreting chromaffin cells of the adrenal medulla [1-5]. In this case, positive neuron specific enolase (NSE) expression evidenced by immunohistochemistry supported the neuroendocrine origin of the tumour. Pheochromocytomas are composed of epinephrine and/or norepinephrine secreting cells or both, and for that reason cell cytoplasm contained granules [1, 2]. Chromaffin granules in the present case indicated catecholamine secretion but the catecholamine secretion by the tumour was not validated by hormonal measurements in blood. Functional pheochromocytomas can cause cardiovascular disorders in the dogs and horse because of the excessive catecholamine secretion [2]. No cardiovascular finding was observed in the present case at necropsy and histopathological examination, probably because of the tumour bigness. Pheochromocytomas often occur in conjunction with ultimobranchial tumours of thyroid in bulls [1, 2, 9]. There was no other tumour diagnosed in this sheep including thyroid.

In the present case, the tumour was small, non invasive and surrounded with connective tissue. Histological aspects of the cells were uniform and only a weak mitotic activity was observed. No metastases were detected in other organs, particularly in lungs. Although all these features suggested a benign behaviour of the tumour, it was considered as malignant because of high Ki-67 activity.
In the present study, a pheochromocytoma was diagnosed by histopathological and immunohistochemical methods in an aged sheep. Tumour incidence is generally low in farm animal compared to pets because of the relatively short life duration. Nevertheless, old farm animals may be also susceptible to tumour like in this report.

References


