

MYELOLIPOMA IN THE ADRENAL GLAND OF A CANINE**MIELOLIPOMA EM GLÂNDULA ADRENAL DE UM CANINO**

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ABSTRACT

The present report aims to describe the macroscopic and histopathological findings of a canine with myelolipoma in the left adrenal gland. Although the adrenal gland tumors are frequently found in dogs, myelolipomas are generally found in cattle or primates and uncommon in other species. A corpse of a mixed-breed canine, with a clinical diagnosis of acute kidney disease, was referred to the Pathology Laboratory for necropsy. At the opening of the abdominal cavity, a vascular mass medial to the left edge surrounding the renal hilum was detected. The left kidney had a higher volume. The mass was microscopically diagnosed as myelolipoma, and changes were found in the left kidney, suggesting renal ischemia. The diagnosis of adrenal myelolipoma was considered an incidental necropsy finding, which was the cause of the death of this canine, while the origin of the bilateral kidney disease was not provided. Although this tumor was not directly related to the death of the animal compatible with ischemia in the left border, benign adrenal tumors, such as myelolipoma, could generate compression at the border.

Keywords: Canine. Endocrine. Neoplasia. Kidney.

RESUMO

O presente relato visa descrever os achados macroscópicos e histopatológicos de um canino com mielolipoma em glândula adrenal esquerda. Tumores de glândula adrenal são neoplasias frequentes em cães, porém mielolipomas são geralmente encontrados em bovinos ou primatas sendo infrequente em outras espécies. Um cadáver de um canino, sem raça definida, com diagnóstico clínico de doença renal aguda foi encaminhado ao Laboratório de Patologia para a realização da necropsia. Na abertura da cavidade abdominal foi encontrada uma massa crânio-medial ao rim esquerdo que circundava o hilo renal. O rim esquerdo apresentava leve aumento de volume. A massa foi diagnosticada microscopicamente como Mielolipoma e no rim esquerdo foram encontradas alterações que sugeriam isquemia renal. O diagnóstico de mielolipoma de adrenal foi considerado um achado incidental de necropsia, sendo a causa da



morte deste canino uma doença renal bilateral de origem não determinada. Porém, apesar deste tumor não estar relacionado ao óbito do animal lesões compatíveis com isquemia no rim esquerdo foram encontradas, demonstrando, que tumores benignos de adrenal, como o mielolipoma, podem gerar lesões por compressão no rim.

Palavras-chave: Canino. Endócrino. Neoplasia. Rim.

INTRODUCTION

Neoplasms in the adrenal glands are common in dogs (LABELLE *et al.*, 2004) and can be classified into adrenal cortex tumors, namely adenoma, carcinoma, and myelolipoma and adrenal medullary tumors such as pheochromocytoma, neuroblastoma, and ganglioneuroma.

However, myelolipomas are commonly found in bovine or primate adrenals, and are uncommon in other species (CAPEN, 2002), with rare reports in dogs (LABELLE; COCK, 2005; TURSI *et al.*, 2005; MORANDI *et al.*, 2007; FRANCE; ECCO; GUEDES., 2008; LEDUR *et al.*, 2012).

Myelolipoma is considered a benign tumor, which is usually inactive and composed of well-differentiated adipocytes and different hematopoietic cells, and is an incidental necropsy finding (CAPEN, 2002; PATEL *et al.*, 2006; ECCO; LANGOHR, 2016); however, it can present compressive changes in the adjacent organs (CAPEN, 2002; PATEL *et al.*, 2006).

This study aimed to describe the macroscopic and histopathological findings in a dog with an unusual neoplasm in the left adrenal gland.

CASE REPORT

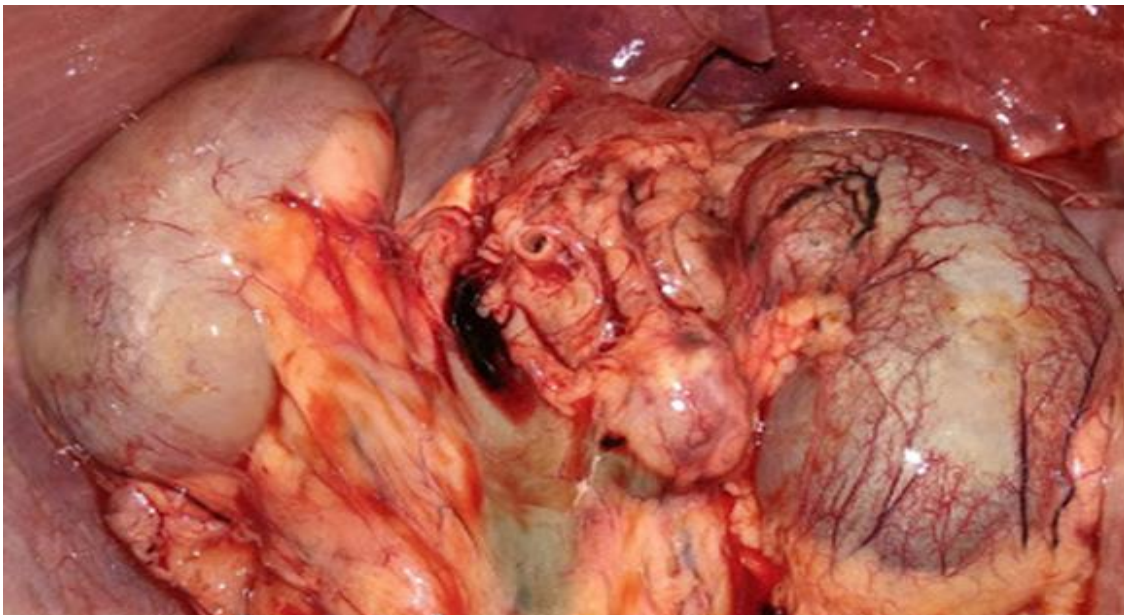
A female adult mixed-breed canine was attended at the Veterinary Center of the Integrated University Center of Campo Mourão, presenting with frequent episodes of vomiting and apathy. In laboratory tests, the animal showed an increase in creatinine (5.07 mg/dL), urea (165.8 mg/dL), and alkaline phosphatase (179.8 U/L) levels, clinically suggesting kidney disease.

The animal was hospitalized, and expired after 2 days, following which necropsy was performed. The corpse had a regular-to-bad nutritional status and slightly pale mucous membranes. A mass was observed at the opening of the abdominal cavity on the cranial-medial face of the left kidney (Figure 1).

The mass was adherent to the abdominal aorta and vascular structures adjacent to the renal hilum (renal artery and vein). The mass was irregular, smooth, reddish-white, and 6.0 × 4.0 × 2.0 cm in size. The cut was friable and yellowish-white with a well-defined cavitation filled with blackish pasty content (Figure 2).

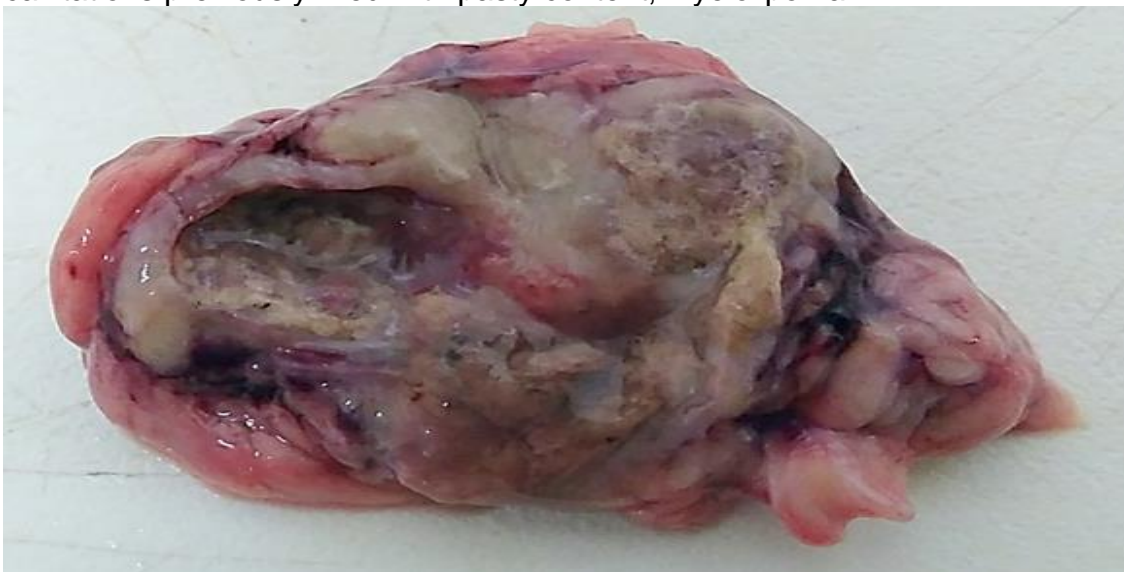
The left kidney had a slight increase in volume, with a moderate congestion on its capsular surface. The right kidney showed a slight reduction in size, with a pale and irregular surface with multifocal areas of depression, and was diffusely pale, on dissection. The left adrenal gland was not visible. The organ fragments were collected, fixed in 10% formalin, processed using the routine paraffin inclusion technique, and stained using the hematoxylin and eosin technique.

Figure 1 - Canine kidney myelolipoma adjacent to the left kidney involving the renal hilum.



Source: the authors.

Figure 2 - The canine adrenal gland with an irregular, yellowish-white mass and cavitations previously filled with pasty content, myelolipoma.



Source: the authors.

In the histological section of the mass, an adjacent markedly thick capsule was observed, with a few cells compatible with the layers of the glomerular zones, which were fasciculated and reticulated; in addition, marked loss of the histological architecture of the gland was observed. In the midst of these cells in the cortical portion of the adrenal gland, there were numerous well-differentiated adipocytes surrounded by the hematopoietic cells of the myeloid and lymphoid lines (Figures 3 and 4). There were multifocal areas with hemorrhage and from the medullary layer, extending to the cortical layer of the adrenal in the central

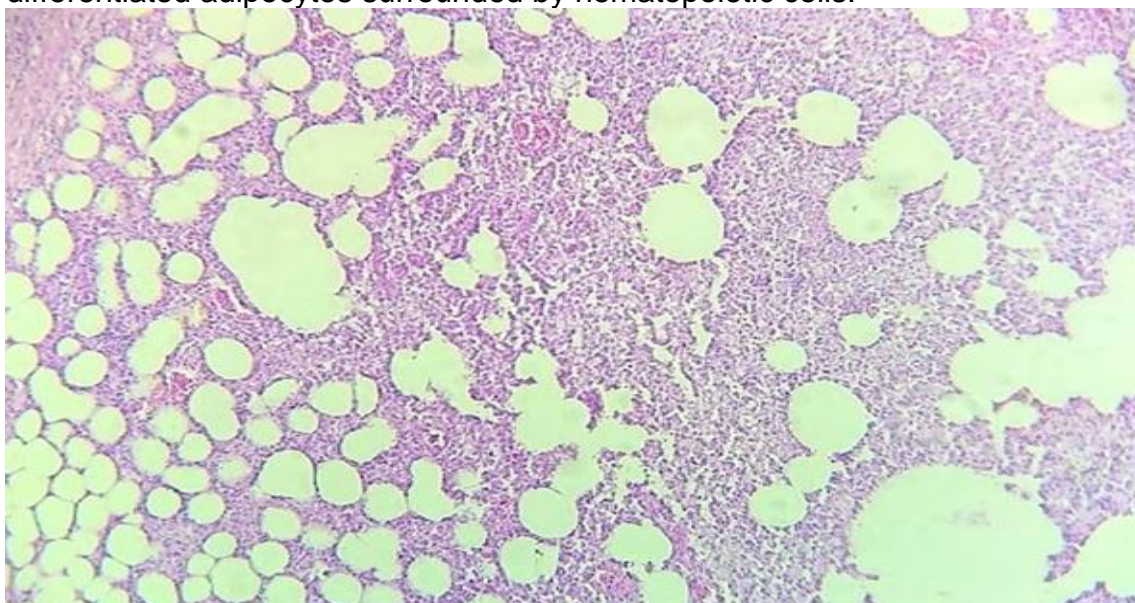
portion, areas of necrosis associated with the presence of venous vascular thrombi were seen.

Both kidneys had a marked inflammatory infiltrate in the interstitium composed of lymphocytes, plasma cells, and histiocytes. In the renal cortex, there were degeneration and necrosis of the tubular epithelium, which were more pronounced in the proximal contorted tubules in the left kidney. Some tubules were filled with cellular debris (granular cylinders). The glomeruli showed moderate thickening of Bowman's capsule, with some showing a marked reduction in the glomerular tuft (sclerosis). In the medullary portion, marked tubular necrosis was observed with deposition of strongly basophilic and granular material (mineralization). In the left kidney, a marked presence of erythrocytes filling the venous capillaries (congestion) mainly on the surface of the cortical portion (Figure 5) was observed.

DISCUSSION

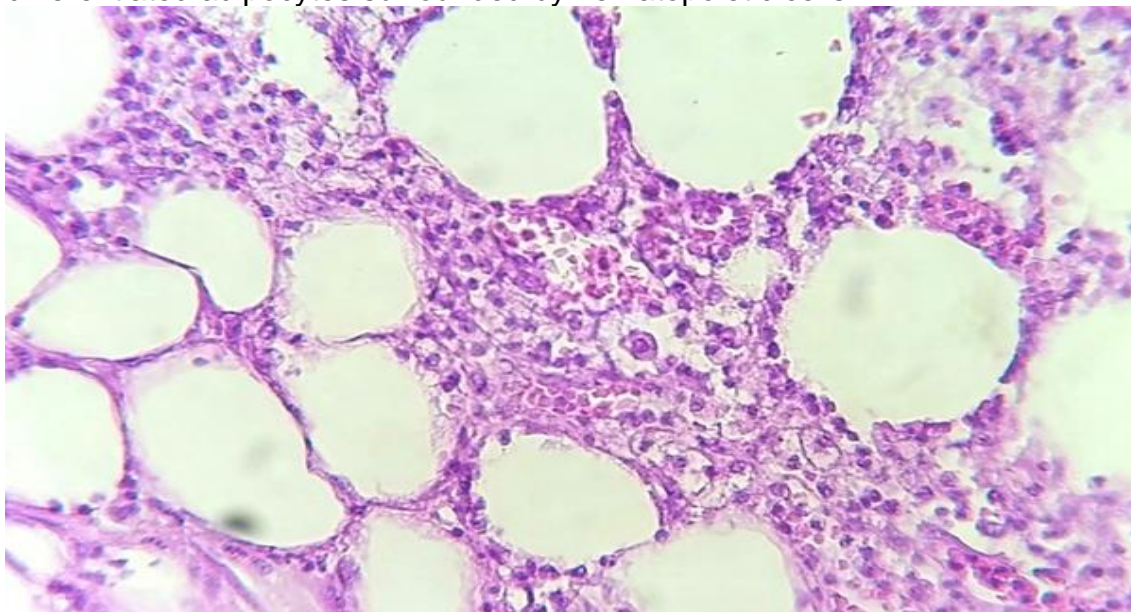
Using the histopathological analysis, the mass was confirmed to be a neoplasm in the left adrenal gland whose histopathological description was compatible with that of myelolipoma (CAPEN, 2002; TURSI *et al.*, 2005; LABELLE; COCK, 2005; FRANCE; ECCO; GUEDES, 2008; LEDUR *et al.*, 2012; ECCO; LANGOHR, 2016). Although its etiology is still not completely understood; several theories suggest the origin of this tumor such as adipocyte hyperplasia, incomplete adrenal embryogenesis, extra-medullary hematopoiesis, or a bone marrow embolism (COTRAN; KUMAR; ROBBINS *et al.*, 2000; ECCO; LANGOHR, 2016).

Figure 3 - Adrenal gland, hematoxylin and eosin (10x magnification). Narrowing of the granular layer and rarefaction of granular cells by invasion of well-differentiated adipocytes surrounded by hematopoietic cells.



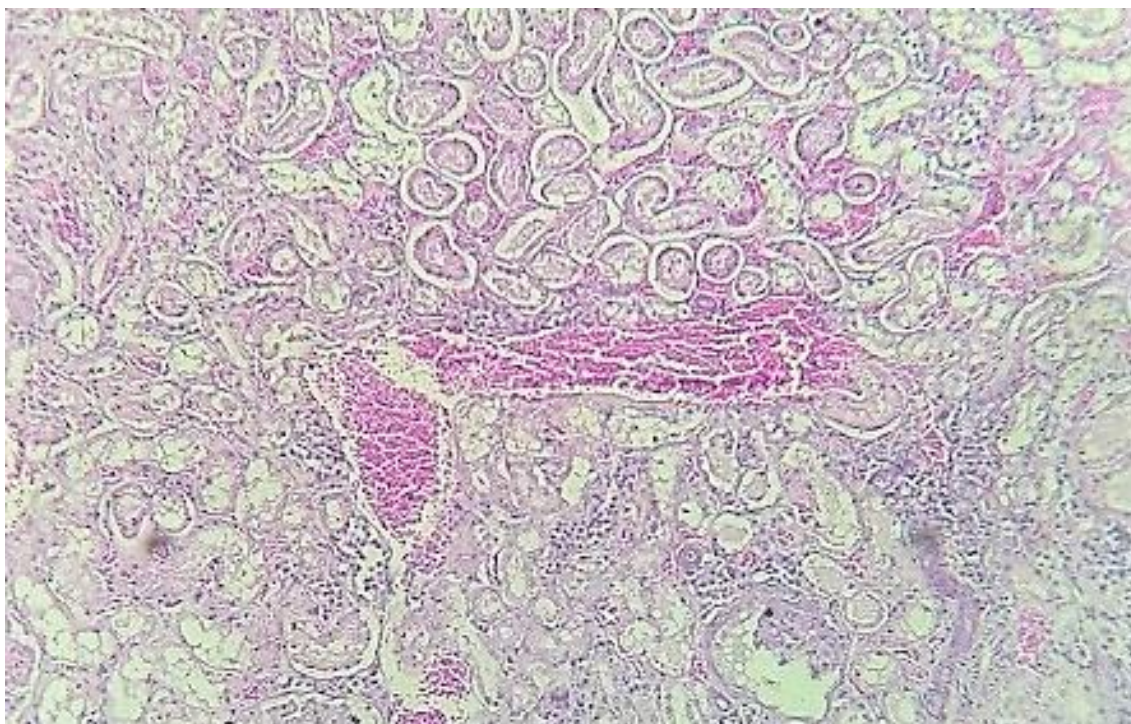
Source: the authors.

Figure 4 - Adrenal gland, hematoxylin and eosin (40x magnification). Atrophy of the granular layer and rarefaction of granular cells by invasion of well-differentiated adipocytes surrounded by hematopoietic cells.



Source: the authors.

Figure 5 - Left kidney, hematoxylin and eosin (10x magnification). Inflammatory infiltrate, degeneration, and necrosis of the tubular epithelium, thickening of Bowman's capsule, and marked presence of erythrocytes filling the venous capillaries (congestion).



Source: the authors.

Myelolipomas are uncommon neoplasms in dogs, with only limited reports (LABELLE; COCK, 2005; TURSI *et al.*, 2005; MORANDI *et al.*, 2007; FRANCE; ECCO; GUEDES, 2008; LEDUR *et al.*, 2012). Although it is usually asymptomatic, found only as a finding in ultrasound or necropsy, its complications are due to the compression of the adjacent viscera, such as the liver, pancreas, and kidney (CAPEN, 2002; PATEL *et al.*, 2006). In addition, although myelolipoma is a benign tumor, Massari *et al.* (2011) stated that the dogs with an adrenal gland tumor having venous thrombosis or masses equal to or greater than 5 cm in size, had a shorter survival time.

In the index case, the left kidney had marked subcapsular vascular dilation and histopathological analysis revealed marked vascular congestion. The passive local congestion can result from compressive neoplasms (JONES; HUNT; KING, 2000; MOSIER, 2012). Thus, we assumed that the extension of the tumor, adjacent to the renal hilum, resulted in compression of the renal vein, reducing its flow (venous stenosis).

As the mass affected only the left portion, the other renal changes, such as glomerulonephritis, glomerulosclerosis, moderate diffuse tubular necrosis, and mineralization, which were found bilaterally, were not related to the tumor.

CONCLUSION

The diagnosis of adrenal myelolipoma was based on histopathological analysis, and since the neoplasm was inactive and noninvasive, it was considered an incidental necropsy finding. Moreover, the canine expired due to a bilateral kidney disease of undetermined origin.

Although this tumor was unrelated to the death of the animal, lesions compatible with venous compression were found in the left kidney. Thus, we aimed to report an infrequent neoplasm in the dog's adrenal gland as well as alert the veterinary clinicians and pathologists about the possibility of an unusual adrenal tumor in dogs, such as myelolipoma, causing compressive injuries in the adjacent organs and structures such as the kidney.

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