PULMONARY PAPILLARY ADENOMA IN A DOG: A CASE REPORT

ADENOMA PAPILAR PULMONAR EM CÃO: RELATO DE CASO

W. L. A. PEREIRA[1*], S. G. B. MONGER[2], A. M. C. CARDOSO[3]

SUMMARY

This study reports a case of pulmonary papillary adenoma, which is a rare benign tumor of the lungs, with just a few cases described in the literature. The study refers to an adult, male, mixed breed dog from the Zoonoses Control Center of Belém, PA, Brazil, that was referred to the sector of Veterinary Pathology of the Federal Rural University of Amazônia. During the anathomopathological examination, a circumscribed whitish nodule in the diaphragmatic lobe of the right lung was observed. Histopathologically, tumor growing margins were not limited by the pseudo-capsule. The cells had cuboidal morphology (or prismatic-like) without atypia, standing in columns, in a papillary growth pattern. These types of tumor findings are completely incidental. Therefore, there are few cases described in the literature. Nevertheless, the process may be precisely identified by analyzing its unique histopathological characteristics.

KEY-WORDS: Adenoma. Canine. Lung. Tumor.

RESUMO

O presente trabalho objetiva relatar um caso de adenoma papilar pulmonar, tumor benigno raro, com poucos relatos na literatura. A casuistica refere a um cão, macho, sem raça definida, adulto sênior, procedente do Centro de Controle de Zoonoses de Belém-PA, encaminhado ao Setor de Patologia Animal da Universidade Federal Rural da Amazônia. No exame anatomopatológico foi observado nódulo esbranquiçado circunscrito no lobo diafragmático do pulmão direito. Histopatologicamente, as margens do crescimento tumoral não estavam limitadas por pseudo-cápsula. As células tinham morfologia cuboidal e/ou prismática, sem atipia, dispondo-se colunarmente, num padrão de crescimento papilar. O achado dessa forma tumoral é inteiramente incidental, portanto apresenta poucos casos descritos na literatura, entretanto o processo pode ser precisamente diagnosticado por meio de suas características histopatológicas únicas.

PALAVRAS-CHAVE: Adenoma .Canino. Pulmão. Tumor.

[1*]Professor Associado, Instituto de Saúde e Produção Animal (ISPA). Universidade Federal Rural da Amazônia (UFRA). Av. Perimetral, 2501, CEP: 66077-830. Belém, Pará. E-mail: wkarton@terra.com.br
[2]Mestranda Ciência Animal. Universidade Federal do Pará. Belém, Pará, Brasil.
[3]Professora Adjunta ISPA/UFRA, Belém, Pará, Brasil.

Submitted: 15/12/2011 Accepted: 23/08/2012

INTRODUCTION

Lung tumors are classified into primary, metastatic and multisystem (NELSON & COUTO, 2001). Primary tumors are relatively uncommon in small animals, representing up to 1% in dogs and less than 0.5% in cats, especially when compared to secondary or metastatic cancer tumors from other body parts (MORRIS & DOBSON, 2007). Metastatic lung tumors are the most common and they result from displacement of malignant cells from a primary site to lymph vessels or veins, reaching the pulmonary circulation and lung tissue (JONES et al., 2000).

Osteosarcomas, hemangiosarcomas, melanomas, squamous cell carcinomas, among others, may cause pulmonary metastases; however, the most common tumors in dogs are the mammary carcinomas, due to its high prevalence in this species (STANN & BAUER, 1985; SOUZA et al., 2001; PRIEBE et al., 2011).

Multisystemic neoplasms are characterized by the proliferation of malignant tumor cells in multiple organs, and can include lungs. The multisystem growth can occur in lymphomas, malignant histiocytosis and mast cell tumors (ETTINGER, 1996; NELSON & COUTO, 2001).

Regarding origin, Wilson & Dungworth (2002) stated that epithelial and non-epithelial tumors can be classified according to their place of origin as bronchogenic, glandular bronchial, or bronchioalveolar, with the histological patterns adenoid, squamous, large and small cells, or a combination of those. Dahme & Weiss (1989) argue that most primary tumors are of malignant and epithelial nature.

Pulmonary adenoma is a rare benign neoplasm, with few cases reported in the literature. It has already been diagnosed in dogs, cattle, older cats and as an incidental finding during the necropsy of a lion euthanized due to a brain oligodendroglioma (STÜNZI et al., 1974; BABA & CÂTOI, 2007; TUCKER et al., 2008).

This tumor is made of mucus-secreting glandular structures with a predominant papillary pattern, and often presents itself as an incidental finding on chest radiographs as a single nodule and well circumscribed (SAITO et al., 2006).

This study aims to report the pathological findings of a case of pulmonary papillary adenoma in a dog, a disease that is uncommon in small animal clinics.

MATERIAL AND METHODS

A small, adult, male, mongrel dog from the Zoonoses Control Center of Belém, PA, Brazil was referred to the sector of Veterinary Pathology of the Federal Rural University of Amazônia to be used in a practical autopsy class.

The dog was affected by the nervous form of distemper with neurological symptoms and had been euthanized using: 10 mg/kg of ketamine and 2.0 mg/kg of body weight of xylazine. After the anesthesia, 1 mL/kg of b.w. of potassium chloride (19.1%) was used. The procedures met the requirements of the Conselho Federal de Medicina Veterinária (CFMV) nº 1000/2012, as published in the Diário Oficial da União of May 17th, 2012, pages 124 and 125. The necropsy was performed, and fragments of several organs and pulmonary nodules were fixed in 10% buffered formalin, processed routinely by the paraffin embedding technique and stained with hematoxylin and eosin.

RESULTS AND DISCUSSION

The occurrence of lung adenomas in humans is considered rare compared to carcinomas (HALLDORSSON et al., 2005). In dogs, primary lung tumors have low incidence compared to humans and among the primary canine tumors, the most common are bronchogenic carcinomas, adenocarcinomas, squamous bronchioalveolar, papilloma bronchial and bronchial gland adenomas (BERTAZZOLO et al., 2002). Hahn et al. (1996) conducted a study in Beagle dogs and registered 40 cases of lung cancer, from which 35 were carcinomas and one a malignant fibrous histiocytoma, in addition to four benign neoplasms, from which three were adenomas and one, a fibroid. Also with respect to the occurrence of lung tumors, Remick et al. (2009) reported 123 cancers in lemurs from the Duke Lemur Center, in the University of Duke, in Durham, North Carolina, USA, where five cases (4%) of the primary neoplasms occurred in the respiratory system, from which three were malignant and two were diagnosed as adenomas.

The dog of the present study was a mongrel, which is an important piece of information to be mentioned, since mixed breed dogs together with Rottweilers and Teckel had the highest number of lung cancer cases (50%) of a data analysis from 1980 to 2008; the data were supplied by the Laboratório Regional de Diagnóstico da Universidade Federal de Pelotas (SCHUSTER et al., 2008). Fossum & Rogers (1998) considered the breeds Boxer and Rottweiler as the most affected ones by primary lung tumors; however, Baba & Câtoi (2007) argue that there is no racial predisposition to lung adenomas in dogs.

The animals affected by lung tumors are generally old, with an average age between 9 and 12 years old, with similar prevalence in both sexes (ETTINGER, 1996, BABA & CÂTOI, 2007), as it is seen in the present case, since the dog was more than 7 years old. Sales Luís et al. (2005) reported three cases of primary lung tumors in old animals, between 11 and 15 years old, while Hahn et al. (1996) diagnosed a high incidence of lung cancer in dogs aged average 13.6 years old.

In the present work, during the necropsy when the lungs were being inspected, a whitish lump, circumscribed and located in the right diaphragmatic lob was observed (Figure 1). According to Kondo et al.

(2001) and Nosotti et al. (2012), pulmonary adenomas in humans are incidental findings and are seen macroscopically as solitary nodules. However, Miller (1994) reported during the autopsy of *Macaca mulatta*, a non-human primate of the Old World, the occurrence of multicenter adenomas, where he found several firm nodules scattered all over the lung lobes.

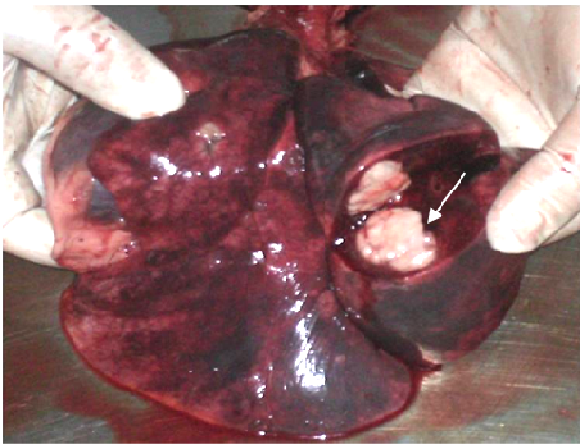

Figure 1 - Cut showing the pulmonary parenchyma with sectioned unicentric node (arrow) formed by whitish tissue located in the right diaphragmatic lobe.

According to Baba & Câtoi (2007) tumors occur most often in the right lung in dogs, although other authors agree that the right and left lungs are affected equally (MORRIS & DOBSON, 2007).

The papillary adenoma may begin as unicentric or multicentric. Its origin is bronchial, in the form of papillary excrescences on the mucosal surface. The tumor may develop on either the epithelial surface or the bronchial mucous glands (BABA & CÂTOI, 2007).

The anathomopathological exam showed that the nodule was round, circumscribed and had grayish white color, similar to what has been described by Baba & Câtoi (2007), who stated that these are characteristics of the pulmonary adenoma. The tumor measured 2.2 x 2.0 cm, which also agreed with the aforementioned authors, who reported that lung papillary adenomas in dogs range from millimeters to 4-5 cm. Ogilvie & Moore (1996) stated that the unicentric primary lung cancer should be differentiated from abscesses.

The diagnosis was reached by histopathological exam of the tumor fragments that showed that tumor growth borders were not limited by pseudo-capsule, a characteristic that has also been reported by Masataka et al. (1999) in a case report of a papillary adenoma in the subpleural region of a Japanese woman's left lung. Miller (1994) refers to the absence of a capsule at the borders of tumor growth in a case of bronchioalveolar adenoma in *Macaca mulatta.* Halldorsson et al. (2005) also reported a human case of alveolar adenoma in which the tumor borders were reasonably circumscribed.

Tumor epithelial cells display columnar and/or cuboid morphology that are arranged in one or more layers of growing cells in a papillary arrangement (Figure 2), where some areas showed a stronger growth. Miller (1994) described these aspects of the bronchioalveolar adenoma in *Macaca mulatta*.

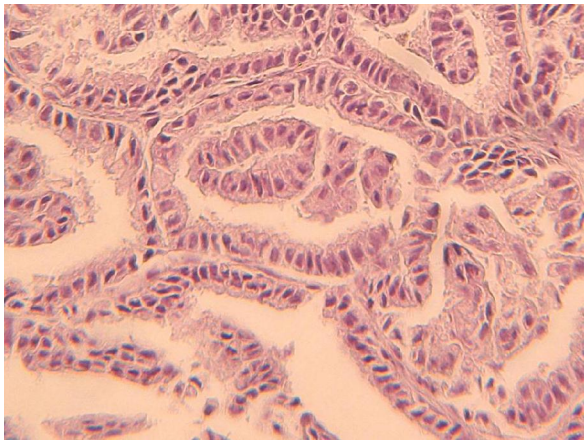

Figure 2 - Pulmonary adenoma showing epithelial cells without atypia forming a column of papillary growth. HE. Original magnification 400x.

The collagenous stromal tumor devoid of inflammatory cells was present inside the papillary projections. Halldorsson et al. (2005) and Nosotti et al. (2012) reported that the interstitium was formed by a myxoid matrix in human pulmonary adenoma cases, which was not observed in the present case. Halldorsson et al. (2005) also observed plasma cells and lymphoid aggregates/constituents (?) on tumor stroma. The morphological characteristics confirmed papillary adenoma diagnosis, since they were similar to those described by Baba & Câtoi (2007) for the papillary bronchial adenoma. The aforementioned authors also state that there may be production of mucin and formation of cysts lined by squamous epithelium, aspects not observed in this case. However, to Saito et al. (2006), the absence of multicystic aspect is what differentiates pulmonary papillary adenoma of alveolar type. Kondo et al. (2011) reported a human case of pulmonary adenoma of alveolar type whose neoplastic cells had the appearance of type II pneumocytes, with no signs of malignancy.

CONCLUSION

Pulmonary papillary adenoma is a rare benign neoplasm that can be clinically confused with other diseases. The definitive diagnosis of this pulmonary neoplasia can be established only by a histopathological examination.

REFERENCES

BABA, A. I., CÂTOI, C. Comparative Oncology. Chapter 7. Tumors of the Respiratory System. Bucharest: The Publishing House of the Romanian Academy; 2007.

BERTAZZOLO, W.; ZULIANI, D.; POGLIANA, E.; CANIATTI, M.; BUSSADORI, C. Diffuse bronchiolo-alveolar carcinoma in a dog. **Journal of Small Animal Practice**, v.43, p.265-268, 2002.

DAHME, E., WEISS, E. **Anatomia Patológica Especial Veterinária**. Editorial Acribia AS, 1989. p.110.

ETTINGER, S. **Textbook of Veterinary Internal Medicine**. Philadelphia: W. B. Saunders, 1996, p.848.

FOSSUM, T. W.; ROGERS, K. S. Sistema respiratório: Oncologia. In: SLATTER, D. **Manual de cirurgia de pequenos animais.** 2.ed. São Paulo: Manole, v.2, 1998. p.2635-2641.

HAHN, F. F., MUGGENBURG, B. A., GRIFFITH, W. C. Primary lung neoplasia in a beagle colony. **Veterinary Pathology**., v.33, n.6, p.633-638, 1996.

HALLDORSSON, A.; DISSANAIKE, S.; KAYE, K. S. Alveolar adenoma of the lung: a clinicopathological description of a case of this very unusual tumour. **J Clin Pathol,** v.58, p.1211-1214, 2005.

JONES, T. C.; HUNT, R. D.; KING, N. W. **PatologiaVeterinária**. 6 ed., São Paulo: Manole. 2000, p.1415.

KONDO, N.; TORII, I.; HASHIMOTO, M.; TAKUWA, T.; TANAKA, F.; TSUJIMURA, T.; HASEGAWA, S. Alveolar Adenoma of the Lung: A Case Report. **Ann Thorac Cardiovasc Surg**, v.17, p.71-73, 2011.

MASATAKA, I.; NAOKO, Y.; YOSHIKAZU, H; YUJI, S.; JIN, Y.; ISAO, S. Papillary Adenoma of Type 2 Pneumocytes in the Lung. **Acta Medica Nagasakiensia**. v.44, n.1-2, p.33-36, 1999.

MILLER, G. F. Bronchiolar-alveolar Adenoma in a Rhesus Monkey *(Macaca mulatta)*. **Veterinary Pathology**, v.31, p.388-390, 1994.

MORRIS, J.; DOBSON, J. **Oncologia em Pequenos Animais**. São Paulo: Roca. 2007.

NELSON, R.; COUTO, C. **Medicina Interna de Pequenos Animais**, 2 ed., Rio de Janeiro: Ed.Guanabara Koogan S.A., 2001. p.241-243.

NOSOTTI, M.; MENDOGNI, P.; ROSSO, L.; TOSI, D.; PALLESCHI, A.; BASCIU. M.; SANTAMBROGIO, L.; FERRERO, S. Alveolar adenoma of the lung: unusual diagnosis of a lesion positive on PET scan. A case report. **Journal of Cardiothoracic Surgery**, v.7, p.1-4, 2012.

OGILVIE, G.; MOORE A. **Managing the Veterinary Cancer Patient: a practice manual**. U.S.A: Veterinary Learning Systems, 1996. p.320-323.

PRIEBE, A. P. S; RIET-CORREA, G.; PAREDES, L. J. A.; COSTA, M. S. F.; SILVA, C. D. C.; ALMEIDA, M. B. Ocorrência de neoplasias em cães e gatos da mesorregião metropolitana de Belém, PA entre 2005 e 2010 **Arquivo Brasileiro Medicina Veterinária e Zootecnia,** v.63, n.6, p.1583-1586, 2011.

SAITO, E. H.; ARAUJO, L. R.; CARNEIRO, L. H.; OLIVEIRA NETO, A. A.; CORREA, J. C.; TEIXEIRA, L. S. C. Adenoma alveolar-relato de caso. **Jornal Brasileiro Pneumologia**., v.32, n.3, p.267-269, 2006.

SALES LUÍS, J. P.; PONTES, J. V.; CARVALHO, A. P. Neoplasias primárias do pulmão em canídeos a propósito de três casos submetidos a cirurgia **Revista Portuguesa Ciências Veterinárias,** v.100, n.553-554, p.95-102, 2005.

SOUZA, V. T. F.; PARAGUASSU, A. A.; MOREIRA, E. L. T. Ocorrência de neoplasias em caninos na cidade de Salvador, Bahia (Achados de biopsias)**. Revista Brasileira em Saúde e Produção Animal.** v.2, n.2, p.53-58, 2001.

STANN, S. E.; BAUER, T. G. Respiratory tract tumors. **The Veterinary Clinics of North America: Small Animal Practice**, v.15, 1985 p.535-546.

STÜNZI, H.; HEAD, K. W.; NIELSEN S. W. Tumours of the lung. **Bull World Health Organ**. v.50, n.1-2, p.9–19, 1974.

SCHUSTER, L. A. H.; GAMBA, C.; BONEL-RAPOSO, J.; FERNANDES, C. G. Perfil dos Felinos e Caninos acometidos por tumores Pulmonares: avaliação da casuística do Laboratório Regional de Diagnóstico no período de 1980 a 2008. In: XVII CONGRESSO DE INICIAÇÃO CIENTÍFICA X ENCONTRO DE PÓS GRADUAÇÃO, UFPel, 2008, Pelotas. **Anais**.

TUCKER A. R.; RAMSAY E. C.; DONNELL R. L. Oligodendroglioma in an African lion (*Panthera leo*). **Journal of Zoo and Wildlife Medicine.** v.39, n.4 p.650-654. 2008.

WILSON, D. W.; DUNGWORTH, D. L**.** Tumors of the respiratory tract. In: MEUTEN, D.J. **Tumors in domestic animals.** 4.ed. Ames: Iowa State University, p.365-399, 2002.