



A Case of Lung Adenocarcinoma Determined by Perianesthetic Death in a Cat

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Abstract

In this case report, a 5-year-old, female cat that died during the perianesthetic period and diagnosed with lung adenocarcinoma was described pathologically. The cat was brought to a private veterinary clinic for shaving and anesthetized. It experienced restlessness, vomiting, respiratory distress and died after a while of anesthetic administration. The necropsy was performed, and gross examination showed multicentric nodular formations ranging in diameter from 1 to 5 cm in lung. Microscopically, lepidic pattern of the adenocarcinoma of lung was diagnosed. To our knowledge, this is a unique case in terms of both related and coexisted rare problems (perianesthetic death and lung carcinoma) in a cat.

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Bir Kedide Perianestezik Ölüm ile Saptanan Akciğer Adenokarsinomu Olgusu

Özet

Bu olgu sunumunda, perianestezik dönemde ölen ve akciğer adenokarsinomu tanısı alan 5 yaşında dişi bir kedi patolojik olarak değerlendirildi. Kedi genel anestezi uygulamasıyla tıraş edilmek için özel bir veteriner kliniğine getirildi. Anestezi uygulamasından kısa bir süre sonra hayvanda huzursuzluk, kusma, solunum sıkıntısı ve bu bulguların sonunda ölüm gözlemlendi. Nekropside, akciğerlerde çapları 1 ile 5 cm arasında değişen, multisentrik yerleşimli nodüler oluşumlar görüldü. Mikroskopik olarak, akciğer adenokarsinomu (lepidik patern) teşhis edildi. Sunulan olgu, bir kedide perianestezik ölüm ile akciğer karsinomunun bir arada görülmesinden dolayı patolojik değerlendirmeye ve rapor edilmeye uygun görüldü.

Anahtar kelimeler: Akciğer adenokarsinomu, perianestezik ölüm, patoloji, kedi.

Introduction

Lung cancer is one of the most important causes of death in human, especially in developed countries. Primary lung tumors are very rare in domestic animals and more often seen in older cats and dogs. Adenocarcinoma is the most common histologic type of lung cancer (Devesa et al. 2005). Similar to the classification made in humans, animals have 5 types of lung carcinoma. These are lepidic, papillary, acinar, squamous, and adenosquamous types (Wilson 2017).

Deaths of dogs and cats in perianesthetic period may occur due to anesthetic and surgical complications and preexisting disease may become one of the factors causing death. Such cases are stressful and troubled for both veterinarians and animal owners (De Lay 2016).

This case report describes a cat that died during the perianesthetic period and diagnosed pathologically with lung adenocarcinoma.

Case report

In this case report, a spayed 5-year-old, female cat brought to a private veterinary clinic for shaving and died perianesthetically. Systemic necropsy of the cat was performed in the department of pathology. Tissue samples taken for histopathological examination were fixed in 10% formalin solution and were embedded in paraffin after routine procedures. Microtome sections (5 µm) from paraffin blocks were used to stain with Hematoxylin and Eosin (H&E) staining technique. Prepared slides were evaluated under light microscope.

It is reported that the owner of the cat brought her to a private veterinary clinic for the purpose of shaving. Then it was planned to shave under anesthesia and for this purpose, general anesthetic medicine was applied. The cat experienced restlessness, vomiting, respiratory distress and died after a while of anesthetic administration. Animal owner reported that the cat had no previous respiratory and related problems.

During the necropsy, multicentric nodular formations ranging in diameter from 1 to 5 cm were seen in the lung. These nodules were grayish-white in color and moderate hard in touch. The cut surfaces of the nodules were homogeneously and also greyish-white in color. No metastatic focus was found in the body. The liver was swollen, soft to touch with blunt edges and also grayish-white foci were detected throughout the liver. In addition, mucosal thickening of intestines with hyperemia was observed.

Microscopically, lepidic pattern of the adenocarcinoma was observed in the lung. This pattern showed alveolar wall thickening because of cuboidal or columnar pleomorphic tumor cell proliferation (Figure 1 and 2). Small papillary projections towards the alveolar lumen were also noted in some areas. Anisocytosis and anisonucleosis were prominent in tumor cells. There was no any evidence of metastasis and vascular spreading. In the liver, it was seen that the classical lobule structure was disrupted due to coagulation necrosis, degenerative changes and congestion (Figure 3). The hepatocytes were swollen and contained varying size of droplets, and sinusoidal dilatation was also observed together with hemosiderin-laden macrophages. In intestines, diffuse mononuclear cell infiltrations with prominent hyperemia were seen in lamina propria. In addition, in some areas, loss of villi was also detected.

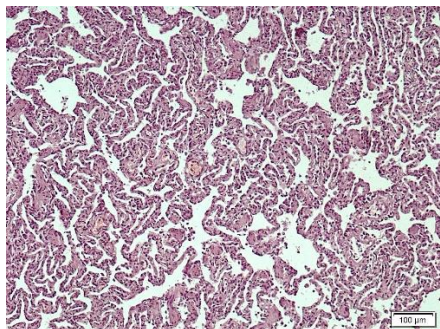


Figure 1. Microscopic appearance of lung adenocarcinoma, H&E, Bar=100 μ m

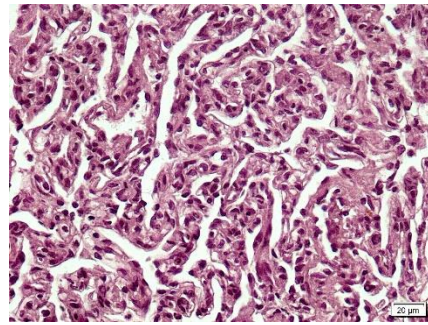


Figure 2. Lepidic pattern of adenocarcinoma, alveolar wall thickening by atypical tumor cell proliferation, H&E, Bar=20 μ m.

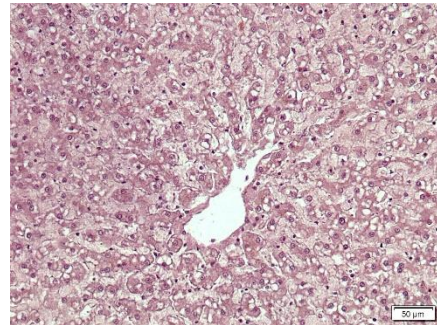


Figure 3. Degenerative changes in the liver, H&E, Bar=50 μ m.

Discussion and conclusion

Cases of animals that die as perianesthesia are increasing day by day and are sent to veterinary diagnostic laboratories for necropsy. In these cases, preexisting health problems or diseases may conduce to mortality. Thus, in a retrospective study of which evaluated necropsy findings in 221 animals with perianesthetic death, preexisting diseases or health problems were demonstrated in most animals. However, surgical or anesthesia-related complications were seen in a much lower rate of cases (De Lay 2016). In the present case, an anesthetized 5-year-old, female cat that referred to a private veterinary clinic due to shaving was showed restlessness, vomiting, respiratory distress and died after a while of anesthetic administration. Gross pathology and histopathology showed pulmonary carcinoma, liver disorders (such as necrosis, degeneration and congestion) and chronic enteritis. In accordance with the literature, it was determined that the cat died after anesthesia because of health problems rather than anesthesia-related complication.

In cats, primary lung cancers are very rare and show a very aggressive spread or rapid progression even more than dogs. Metastases occur in approximately 75-80% of cases and are observed generally in bronchial lymph nodes and intrathoracic region; rarely in bones of the feet and digits (Costa et al. 2012; Thrift et al. 2017; Wilson 2017). In addition,

in a case, invasive spreading of pulmonary adenocarcinoma in the esophagus and heart also detected in a cat (Ambrosini et al. 2018). However, in our case, there was no any evidence of distant metastasis grossly and histopathologically.

Generally, histologic patterns of pulmonary carcinoma include lepidic, papillary, acinar, squamous, and adenosquamous types. Separate lepidic and papillary growth of lung carcinoma is seen approximately 25% compared to other types in cats (Wilson 2017). In the lepidic type, alveolar wall thickening by pleomorphic alveolar type 2 pneumocyte-like cell proliferations is prominent histopathologic finding (Zhang et al. 2013; Wilson 2017). In this case, alveolar wall thickening due to atypical tumor cell proliferations together with micropapillary projections towards the alveolar lumen in some areas were observed and determined as lepidic type of pulmonary carcinoma.

In conclusion, this is a unique case in terms of both related and coexisted rare problems (perianesthetic death and lung carcinoma) in a cat. In this regard, this report may help veterinary clinicians and animal owners get at the most likely diagnosis and treatments.

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