



Necrotic pancreatitis in *Didelphis albiventris* (White-eared opossum)

Pancreatite Necrótica em *Didelphis albiventris* (Gambá- de-orelha-branca)

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ABSTRACT

Pancreatitis is inflammation of the pancreas that induces the activation of digestive enzymes within the organ, which causes damage to the pancreatic tissue. In domestic animals, the clinical signs are visible and easy to identify, but in wild animals that have nocturnal habits, the diagnosis becomes more complex. A white-eared opossum was sent to a zoo where it became part of the herd due to illnesses such as obesity, osteodystrophy and decreased visual acuity. After showing a lack of appetite, the animal was found dead with pale and slightly jaundiced mucous membranes. The necropsy report indicated that death was due to cardiorespiratory failure due to mixed shock, which may be secondary to necrotizing pancreatitis. In view of this, it is believed that the history of obesity and malnutrition of the animal may be factors that contributed to the final diagnosis.

Keywords: Necrotic pancreatitis, Didelphidae, Necropsy.

1 INTRODUCTION

Didelphis albiventris, popularly known as the white-eared opossum, is a mammal that belongs to the Didelphidae family. It is an animal that originates in the American continent, with occurrences from Canada to southern Argentina [1]. The opossum is an animal of nocturnal habits, with small to medium size and weighs around 10 grams to 3 kg. Its diet is based on fruits, seeds and small vertebrates [2].

The incorrect diet of wild animals is one of several factors that lead these animals to develop problems related to malnutrition, among others [3]. Thus, the continuous



supply of foods that are not suitable for the species, cause initial problems such as obesity to lead to more delicate conditions such as pancreatitis.

Pancreatitis is inflammation of the pancreas that causes activation of digestive enzymes causing damage to pancreatic tissue. Clinical signs of acute pancreatitis in dogs and cats appear suddenly, with inflammation of the pancreas, abdominal pain, vomiting, diarrhea, lethargy, anorexia and dehydration, which can lead to death. Chronic pancreatitis, on the other hand, is characterized by a continuous inflammatory process, where there is impairment of the parenchyma and the endocrine and exocrine functions of the organ [4,5,6].

Pancreatitis is more prevalent and severe in obese animals. High-fat, low-protein diets are also triggers, in addition to malnutrition. In rats, a study demonstrated that cholesterol-rich diets induce hyperlipidemia and aggravate necrotizing pancreatitis [7].

Some drugs may also be associated with the development of pancreatitis such as L-asparaginase, furosemide, sulfonamides, tetracyclines, etc [5]. In an experimental study with opossums in the United States, it was shown that within 24 hours of induced pancreatitis, signs of inflammation and fat necrosis are already noted [8].

Infection of pancreatic and peri-pancreatic tissues occurs due to translocation of intestinal bacteria [9,10,11]. In opossums, two mechanisms of bacterial colonization are likely, translocation from the intestine to the mesenteric lymph nodes or through the bile ducts and then into the bloodstream [12]. Lung lesions are the most important extra-abdominal dysfunction caused by acute pancreatitis [13,14].

2 MATERIALS AND METHODS

An adult female *D. albiventris*, with typical fur of the species, was sent to a zoo after passing through a wildlife emergency care center. The history was of being bred by residents with an inappropriate diet for the species. The animal presented osteodystrophy and obesity. Calcium supplementation and diet correction were initiated, as well as encouragement to exercise, in an attempt to lose weight.

Even with treatment attempts, the animal continued to show body changes as a sequel to osteodystrophy, moving with some difficulty and also with decreased visual acuity. Therefore, it was decided to keep her under human care and she became part of the zoo's squad.

In March 2023, it was observed that the skunk changed its behavior, became less active and did not feed properly for two days. The next day she was found dead in the



enclosure, with pale and slightly icteric mucous membranes. The animal's body was sent for necropsy and histopathology on the same day, being kept under refrigeration until shipment.

3 RESULTS

At necropsy, during macroscopic examination, it was identified that the spleen and intestines were unchanged. The liver was congested and mottled in appearance. In the pancreas, a firm, lobulated, whitish mass with discrete hemorrhagic areas was identified, which was adhered to the omentum and spleen. The stomach had edematous and hyperemic mucosa and the adrenals and kidneys were congested.

In the cervical region, the glottis showed edema and hyperemia. The trachea and bronchi had a slight amount of free fluid and the esophagus was unchanged. In the thoracic cavity, the lungs were congested and edematous and the heart presented dilatation of the right atrium and ventricle.

On microscopic examination, the spleen was showing multifocal and random areas of necrosis, with an intra-abdominal mass adhered to the organ with large areas of fat necrosis and hemorrhage, showing a multifocal purulent neutrophilic inflammatory infiltrate and at the periphery a capsule containing deposition of inflammatory cells. The intestine was autolyzed. The liver was congested, showing diffuse and random multifocal hepatocyte vacuolization, mild multifocal lymphoplasmocytic inflammatory infiltrate, and thickening of the capsule with chronic serositis. Pancreas with large diffuse areas of necrosis, as well as necrosis and saponification of fat in the periphery, showing extensive multifocal areas of neutrophilic inflammatory infiltrate. The adrenal glands were congested and the kidneys were unchanged.

The heart showed increased intersyndical tissue, presence of a wide and focal area of hemorrhage, necrosis and vacuolization of cardiomyocytes, with moderate lymphoplasmocytic inflammatory infiltrate, as well as bacterial emboli and discrete lumps of bacteria dispersed randomly. The lung was congested with intense edema, diffuse atelectasis with active chronic interstitial pneumonia, moderate and diffuse lymphoplasmocytic inflammatory infiltrate and presence of amorphous basophilic material in the bronchiolar lumen.

After analysis, it was concluded that the skunk died due to cardiorespiratory failure resulting from mixed shock (circulatory and toxemic) secondary to necrotic



pancreatitis and chronic peripancreatic fat necrosis and associated with pulmonary edema resulting from septic myocardial necrosis and chronic interstitial pneumonia.

4 CONCLUSIONS

Pancreatitis in wild animals under human care can be difficult to diagnose, especially in animals with nocturnal habits, which spend the day sleeping, often in burrows. Signs such as the characteristic abdominal pain may go unnoticed.

Thus, it is believed that a history of malnutrition and obesity were contributing factors to necrotizing pancreatitis in this opossum, since there was no history of medication use cited as possible causes. Another factor is that the animal received a balanced diet, having not consumed any different food in the previous days.

Necrotizing pancreatitis without the presence of fibrosis is more prevalent than suppurative pancreatitis in cats [6], similar to the case described. This may lead us to believe that the presentations manifested by opossums may be similar to those of cats. Thus, further studies are needed to identify the etiology and clinical presentation of pancreatitis in opossums.



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