

Article

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## THE IMPORTANCE OF CANINE PANCREATIC LIPASE IN RELATION TO ULTRASOUND EXAMINATION

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### Abstract

Pancreatitis represents the most often met pathology of the exocrine pancreas. It can be acute or chronic depending on the percentage of lesions to the parenchyma. The causes of the pathology aren't fully understood yet but it has been observed that inadequate nutrition has a really important role. Some breeds are thought to be more predisposed to this pathology such as: Yorkshire Terrier, Cocker, Dachshund. The clinical signs can range widely; many patients are subclinical (especially the ones with chronic pancreatitis), while others can have a variety of gastro-intestinal signs. We can divide this signs into characteristic ones (such as vomiting, diarrhea, apathy, abdominal pain) and uncharacteristic signs (such as ascites, jaundice, fever). Seeing the complexity of this pathology, just a simple clinical examination won't help us diagnose it, but will give us clues for what paraclinical exams to take. This article will present the correlation between ultrasound imagistic findings considered to be the main tool for examination of the pancreatic structure and canine pancreatic lipase (also known as CpL), considered to be the golden standard for detecting pancreatic disorders.

**Key words:** Pancreatitis, CpL, Ultrasound

### Introduction

Pancreatitis represents the most often met pathology of the exocrine pancreas. It can be acute or chronic, depending of the type of tissue lesion. Both forms can be severe (Ettinger S., Feldman E., Cote E., 2016). The causes are still under research but there are some predispositions for dogs with an improper diet or nutritional deficiency. Severe traumas, some types of surgery or large number of triglycerides combined with hyperadrenocortisim (Cushing syndrome) have been also remarked (Xenoulis PG, Levinski MD, Suchodolski JS, et al., 2011). Some breeds can be predisposed for this affection such as: Schnauzer, Yorkshire Terrier, Cocker, Dachshund or Poodle (Bishop MA, Xenoulis PG, Levinski MD, et al., 2010; Furrow E, Armstrong PJ, Patterson EE., 2012)

In the initial phase, the pancreatic juice secretion reduces and some factors will make the pancreatic enzymes to activate inside the pancreas instead of the intestinal tract. The enzymes will auto-digest the pancreas, determining the inflammation and the lesions observed at the level of the parenchyma (Hess RS, Kass PH, Shofer FS,

et al., 1999). The clinical signs have a wide range, from apathy to vomiting, dehydration, abdominal pain or diarrhea. Some cases can be asymptomatic or have unspecific signs (Cook AK, Breitschwerdt EB, Levine JF, et al, 1993).

The diagnosis of this pathology requires a good anamnesis, a clinical examination, blood tests and imagistic exams.

The main imagistic exam for pancreatic assessment is represented by ultrasonography. It has limitations depending on the equipment, operator experience or the severity of the pathology. In case of pancreatitis some changes have been observed at the level of echogenicity, echotexture, reaction of the surrounding mesentery or peripancreatic free fluid. This changes can also be used in a scoring system for assessing the severity of the disease (Cridge H, Sullivant A.M., Wills R., Lee A., 2020).

Canine pancreatic lipase is considered at the moment the golden standard for the diagnostic of pancreatitis in alive dogs. It is the only measurement that focuses only on the pancreatic lipase. Studies have shown that its sensitivity is under 100%, reaching 86% in some studies compared with pathologic findings (Trivedi S.,

Marks S.L., Kass P.H., et al, 2011) and for a better result it is required to have a good history of the

### MATERIAL AND METHOD

In the period of 1st of January 2023 and 1st of October 2023 a total number of 390 male dogs were seen at the Faculty of Veterinary Medicine Iasi, in the Imagistic Department and at the Endoscopy and Minimally Invasive Surgery Center from Bucharest. All these dogs had a clinical examination and abdominal examination; a total of 51 dog from the 390 had pancreatic changes on ultrasonography and gastro-intestinal signs. From the 51 dogs only 37 had a canine pancreatic lipase measured.

The ultrasonography was made on a GE Logiq V5 (figure 1) machine in Iasi and on a Samsung HS50 machine (figure 2) in Bucharest. On both machines the same imagist evaluated the cases using a microconvex and linear probe.

patient, clinical signs and imagistic diagnosis (Cridge H, Sullivant A.M., Wills R., et al, 2020).

Lateral and dorso-ventral recumbency was used depending on the cooperation of the patient.

The canine pancreatic lipase (CpL) was measured quantitative in both cities with different devices.

The ultrasound changes were represented by 1 or more of the next: change in size, change in echogenicity, change in echotexture, surrounding mesentery reaction, peripancreatic free fluid, changes of the duodenum near the right pancreatic lobe (with 1 or more of the anterior changes) or pain during the deep palpation of the pancreatic area with the ultrasound probe.

The CpL was categorized in 3 stages: 0-200 µg/L (no pancreatitis), 200-400 µg/L (suspicion of pancreatitis and over 400 µg/L (pancreatitis).



Figure 1. GE Logiq V5 ultrasound machine



**Figure 2. Samsung HS 50 machine**

## RESULTS AND DISCUSSIONS

During the period 1st of January and 1st of October a number 390 cases were seen on ultrasonography, from these 51 had pancreatic lesions, meaning 13%. From the 51 cases, only 37 of them had the value of canine pancreatic lipase measured and are part of the study.

37 cases had a full clinical examination, ultrasound examination and canine pancreatic lipase measured from which 23 were males and 14 females. There is a larger number of males than females, without any clinical or pathological meaning.

Regarding age, patients were categorized in 2: under 7 years, a number of 8, where the average age was 4.6 years ranging from 2 to 7 years; over 7 years a number of 29, where the average age was 10.9 years ranging from 8 to 15 years. There is a 78.3% (29) of cases being over 7 years, an explanation would be the subclinical pathologies of the pancreas that appeared in time and left lesions at this level.

Most breeds were represented by small sizes such as Yorkshire terrier (a number of 13), Bichon (a number of 5), Beagle, French bulldog, Jack Russel, Italian whippet, Teckel but also a small number of medium sized such as Labrador (2), mixed breeds or Swiss shepherd. A reason for the large number of small size breed could be explained by the longevity (having more chances in life to have different subclinical or clinical lesions) and many of them living in an indoors lifestyle with a mixed diet (including same food ate by the owners).

Ultrasonographic changes were seen as change in size, change in echogenicity, change in echotexture, surrounding mesentery reaction, peripancreatic free fluid or pain during the deep palpation of the pancreatic area with the ultrasound probe. 13 of the patients had only one of this changes while the rest of 24 had 2 or more. The most seen changes were echogenicity (Figure 3) changes in 32 out of 37, size changes (Figure 3,4) in 16 out of 37, echotexture changes in 12 out of 37 (figure 5) and pain in 5 out of 37.



Figure 3. Hyperechoic pancreas with enlargement



Figure 4. Enlarged pancreas with corrugated duodenum



**Figure 5. Enlarged pancreas with changed echotexture**

The canine pancreatic lipase was categorized in 3 with the following results: below 200  $\mu\text{g/L}$  with a number of 8 patients that had an average of 90.3  $\mu\text{g/L}$  and a range between 10 and 158  $\mu\text{g/L}$ ; between 200 and 400  $\mu\text{g/L}$ , with a number of 10 patients that had an average of 322.1  $\mu\text{g/L}$  and a range between 221 and 395  $\mu\text{g/L}$ .; over 400  $\mu\text{g/L}$ , with a number of 19 patients that had an average of 700  $\mu\text{g/L}$  with a range between 409 and 1400  $\mu\text{g/L}$ . We could conclude from this that only 8 from 37 patients with ultrasonographic lesion and gastro-intestinal clinical signs had a normal CpL while the rest of 29 had at least the suspicion of pancreatitis. The correlation would be that 78% of cases from this study, with pancreatic changes on ultrasonography, presented changes on canine pancreatic lipase suggestive for pancreatitis.

### CONCLUSIONS

Diagnosis of pancreatitis requires a complex protocol involving clinical examination, imagistic exams and blood analyses. Adult and geriatric patients are more predisposed to this pathologies, one reason being the lesions at the level of the pancreas accumulated during the years. Ultrasonography combined with canine pancreatic lipase will give us a good correlation towards confirming a pancreatitis diagnosis.

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