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WHEN GALLBLADDER OEDEMA COMES AS A CHRONIC DISEASE – DIAGNOSIS AND TREATMENT

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Abstract

Diagnosis of the gallbladder oedema is difficult during the clinical examination because the clinical signs are not specific for this disease. The causes of this pathology are multiple and can be divided into emergencies (such as anaphylactic shock, right-sided hearth failure, pericardial effusion) and chronic pathologies (such cholecystitis, pancreatitis or immune-mediated hemolytic anemia). Imagistics methods complete the information of the clinical exam and ultrasound is considered the golden standard for diagnosing this pathology. Normally, at the ultrasound exam, the gallbladder has a hyperechoic wall, with a diameter of 2-3 mm; while in case of gallbladder oedema, the wall is thick and has a triple stratification, with 2 hyperechoic rows, separated by a hypoechoic line. This pathognomonic description of the gallbladder oedema is also known as the 'Halo Sign' or 'Double Rim Effect'. Making a correct differential for the appearance of the sign is vital for the outcome of the case. The main focus is to exclude every emergency cause in order to start treating the chronic pathologies. This paper presents the pathologies leading to gallbladder oedema, met at the Radiology and Emergencies Departments from the Faculty of Veterinary Medicine Iasi during the period march 2020 – may 2022. The clinical case presented was diagnosed and treated at the Center of Endoscopy and Minimally Invasive Surgery Bucharest.

Key words: Gallbladder Oedema, Ultrasound, Surgical treatment

Gallbladder oedema clinical signs are not specific having a large range; they can include: vomiting, abdominal pain, diarrhea, effusion, anemia. The causes of this gallbladder wall lesions are multiple and can be divided into emergencies and non-emergencies as followed:

Table 1

Emergencies that can cause gallbladder oedema	Non-emergencies that can cause gallbladder oedema
Anaphylaxis	Cholecystitis
Right-sided hearth failure	Pancreatitis
Pericardial effusion	Hypoalbuminemia
	Immune-mediated hemolytic anemia

Ultrasound is more used in veterinary medicine and is considered the golden standard for diagnosing the gallbladder oedema. Normally, at the ultrasound exam, the gallbladder has a hyperechoic wall, with a diameter of 2-3 mm (figure 1); while in case of gallbladder oedema, the wall is thick and has a triple stratification, with 2 hyperechoic rows, separated by a hypoechoic line. This description of the gallbladder oedema is also known as the 'Halo Sign' or 'Double Rim Effect'(figure 2). Other imagistic exams that can help us view the oedema is represented by

computer tomography (Lisciandro G.R., Gambino J., Lisciandro S.C, 2021).

Gallbladder oedema is most seen in cases of anaphylaxis. It is also the organ considered to be the canine shock organ because of the high concentration of mast cells from the level of the liver and gastrointestinal tract. The cause of the oedema is the massive release of histamine in the portal circulation; this will result into hepatic venous constriction and congestion (Lisciandro G.R., 2021).

Other emergencies where we can find this sign are represented by right-hearth failure or pericardial effusion. In this cases, there is a mechanical obstruction of blood flow into the right atrium, that with lead towards a backflow at the level of the vena cava and distension at this level. This will finally result in hepatic venous congestion and wall oedema (Lisciandro G.R., 2021).

On the other hand, some of the most common non-emergencies that can cause this sign are represented by hypoalbuminemia, cholecystitis and pancreatitis. Hypoalbuminemia and its relationship to gallbladder wall oedema is still under study but recent papers show that the the level of albumins in plasma or serum is not associated with the gallbladder imaging, having a delay of 48 hours and sometimes other causes may be responsible for the imaging changes (Murakami M. et all, 2023). Colecystitis can sometimes, in chronic cases, give ultrasound changes and a small percentage have been seen with wall thickening or a fake aspect of oedema (Mitsui I., Ohtsuki S., Uchida K., 2021).

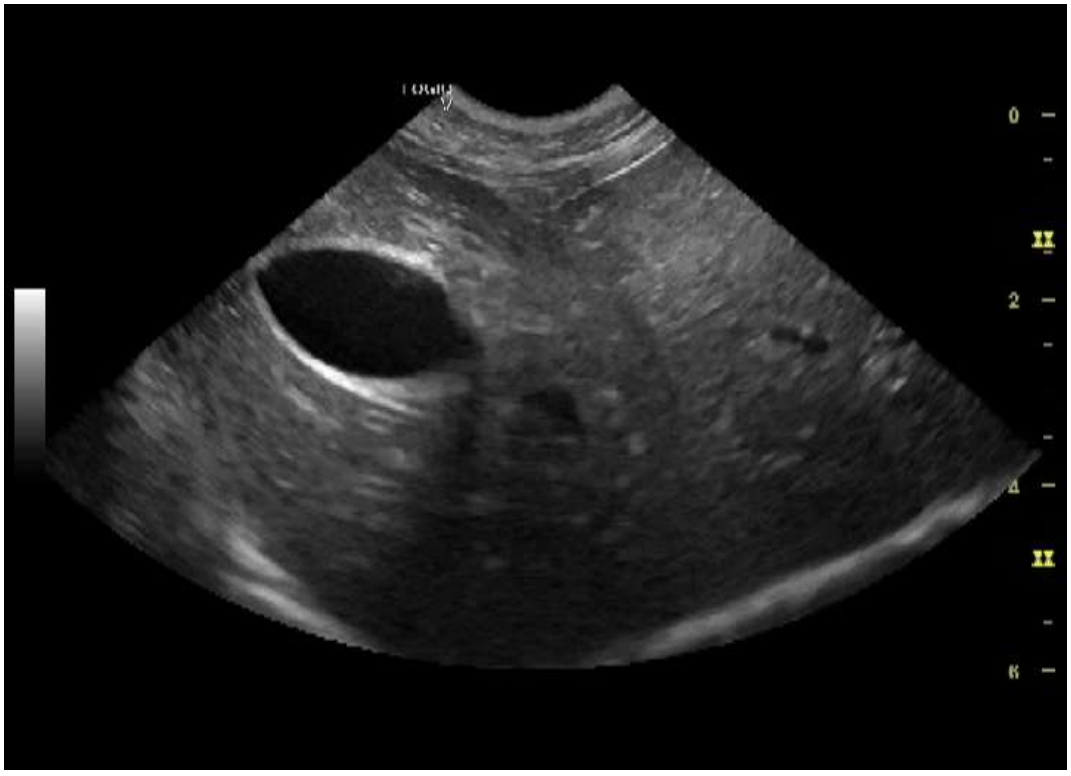

Figure 1. Normal gallbladder on ultrasound

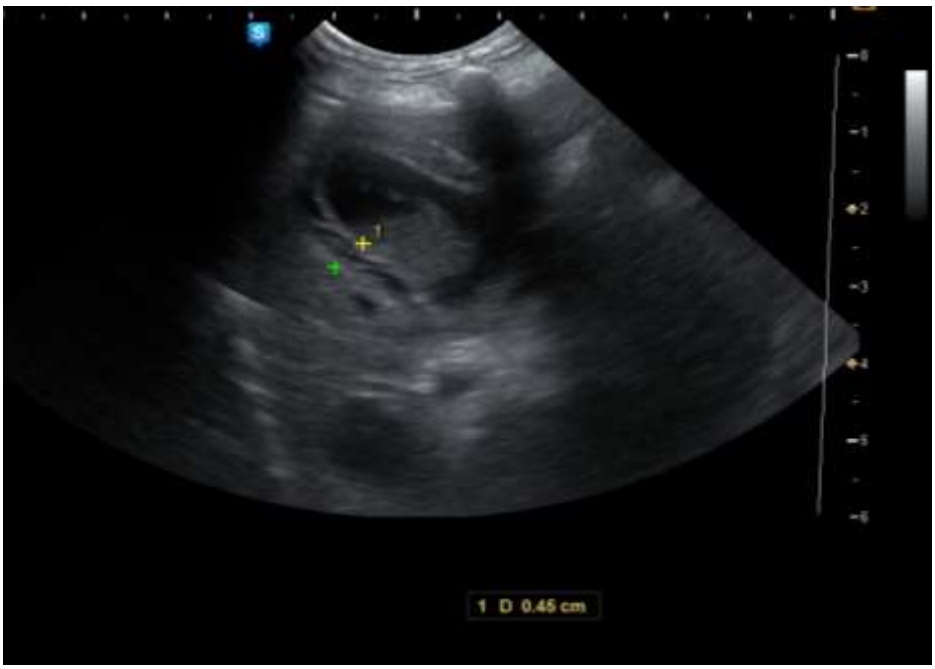

Figure 2. Gallbladder wall oedema, with the thickening of the wall (0.45 cm) and sludge

A treatment for this pathologies can be represented by cholecystectomy. Classic and laparoscopic cholecystectomy are both used in dogs but nowadays the laparoscopic method is being used more and more for its better outcome (Kanai H. et all, 2018).This surgeries can be seen also in human medicine in cases of acute cholecystitis or gallbladder stones; laparoscopic surgery has become a golden standard in human medicine (Acar T. et all, 2017; Van Breda Vriesman A. et all, 2007).

CASE SUMARY

A 3 year old F, Yorkshire Terrier presented to the clinic with vomiting, abdominal pain and apathy. There were no other findings at the clinical examination so an abdominal ultrasound and blood analyses were performed. The abdominal ultrasound showed an inflammation at the level of the pancreas, some biliary sludge and a thickened gallbladder wall with a suspicion of oedema (figure 3). The blood analyses showed a normal complete blood count, hypoalbuminemia (2.1 g/dL, normal range from 3.2 to 4.1 g/dL), increased ALP (253 U/dL, normal range from 7 to 115 U/dL), increased CRP (107 mg/L, normal range from 0 to 20 mg/L) and increased CPL (over 1000 µg/L, where over 600 µg/L is compatible with pancreatitis).

The dog was admitted for fluid therapy and supportive care.

The medication treatment with fluid therapy was given for 3 days without any improvement signs. The ultrasound was repeated the 2nd day without any major changes and the 3rd day again when the gallbladder oedema was more pronounced (figure 4).

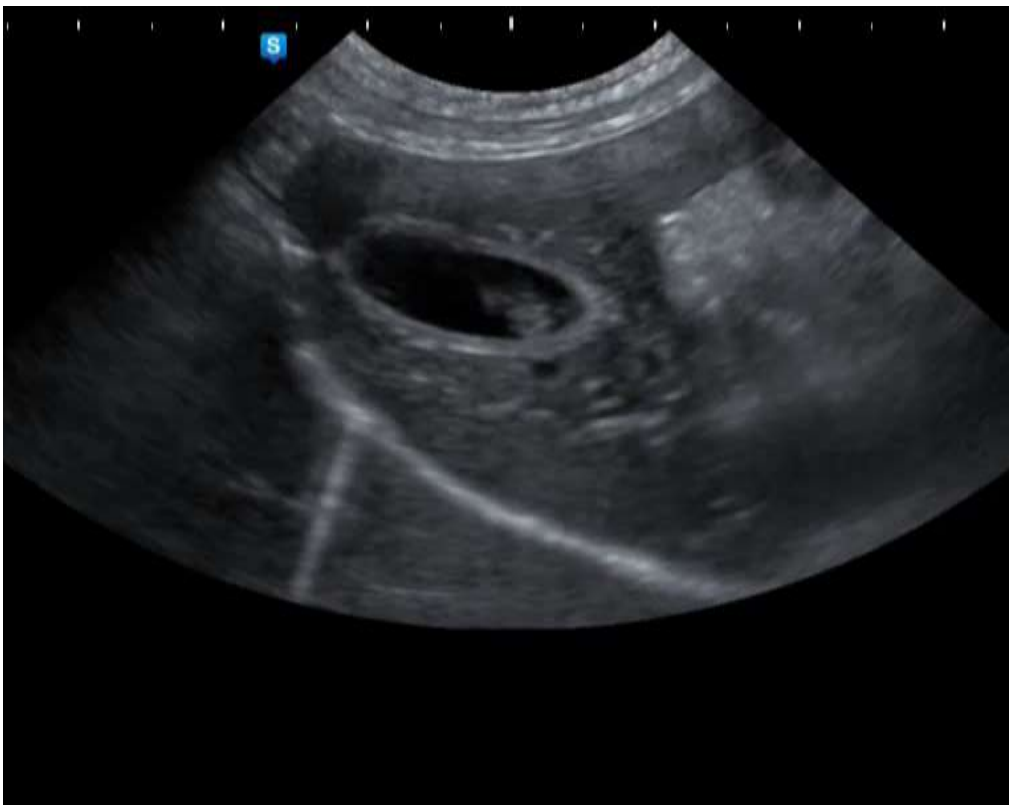

Figure 3. Ultrasound aspect of gallbladder sludge with thickened wall and a suspicion of oedema

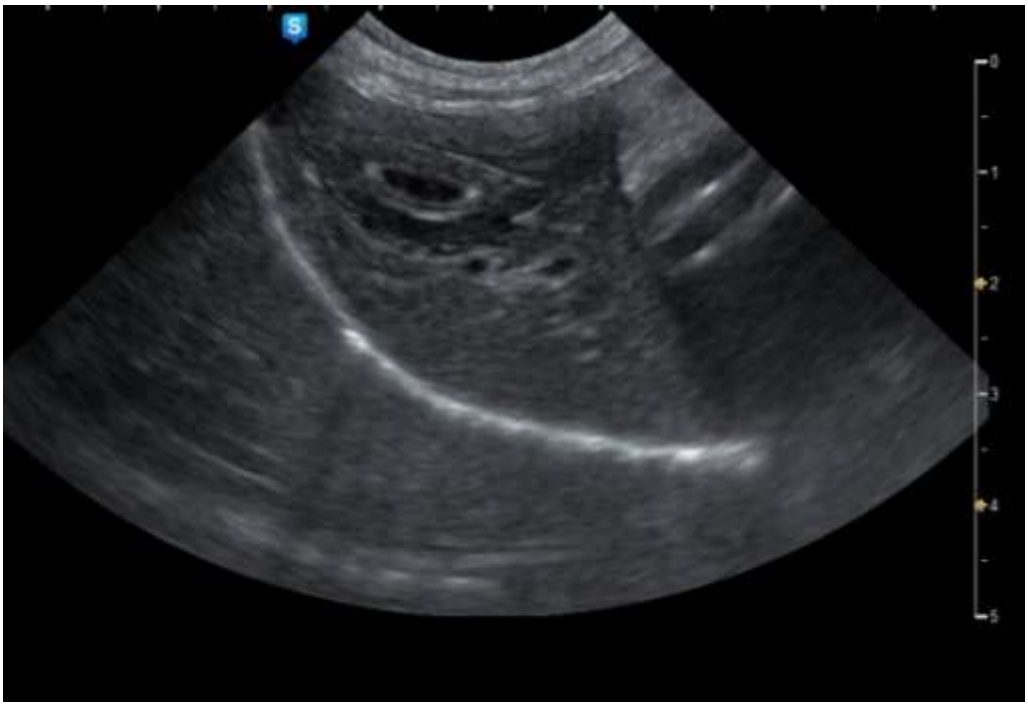

Figure 4. Ultrasound aspect of wall oedema

In the 3rd day the analysis were repeated showing changes on the CBC: WBC increased to 23.4 10^9/l (ranging from 6 to 17 10^9 /I) and RBC decreased to 3.7 10^{12}/l (ranging from 5.5 to 8.5 10^{12}/l). The biochemistry showed a lower albumin (1.7 g/dL) and no other significant changes from the 1st day.

In this case the decision was of advanced imagistic exams (Computer tomography) and laparoscopic cholecystectomy. Computer tomography showed the gallbladder wall changes

(figure 5 and 6) without any other significant findings.

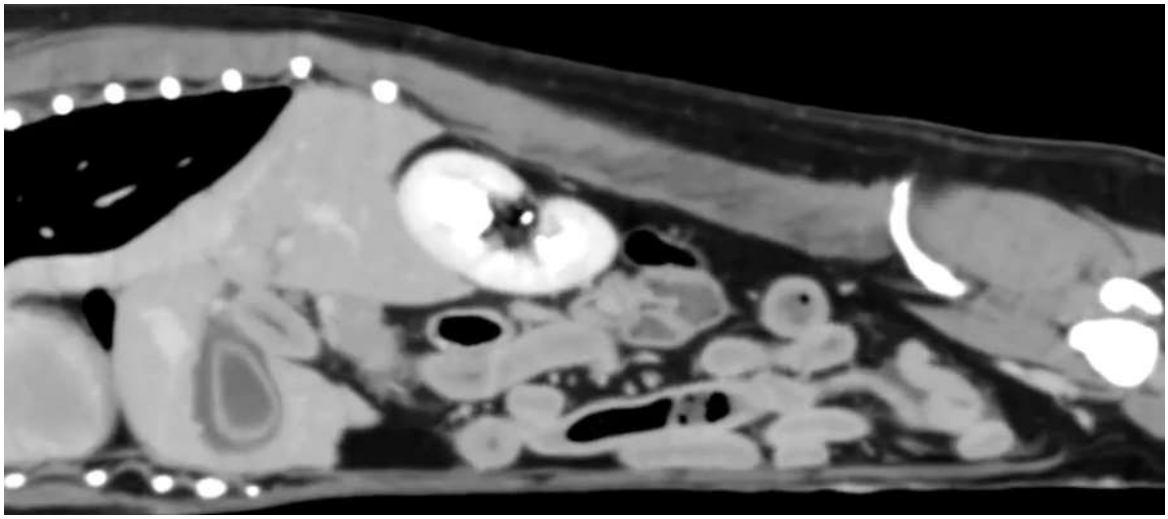

Figure 5. CT thickening and oedema of the gallbladder wall (Sagital)

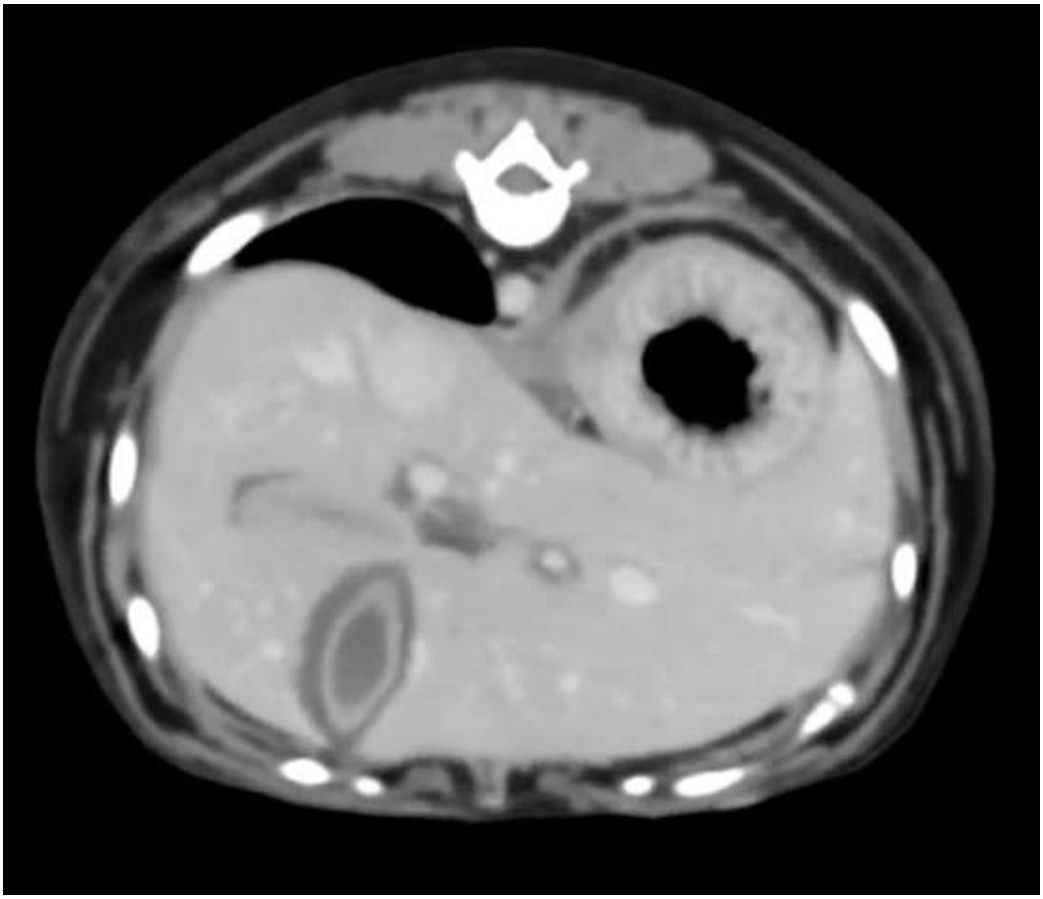

Figure 6. CT thickening and oedema of the gallbladder wall (Axial)

Laparoscopic cholecystectomy was started but because of intra-operatory complications, it was decided to convert to classical surgery (figure 7). The gallbladder (figure 8) was sent to the laboratory for histopathology where the result was chronic limfoplasmocitar cholecystitis and to bacteriology where the result was negativ.

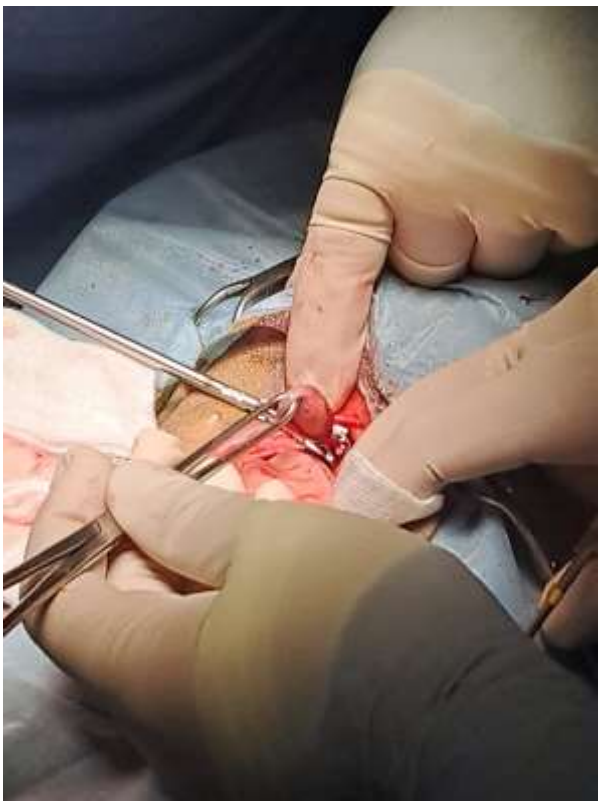

Figure 7. Surgical aproach of the gallbladder

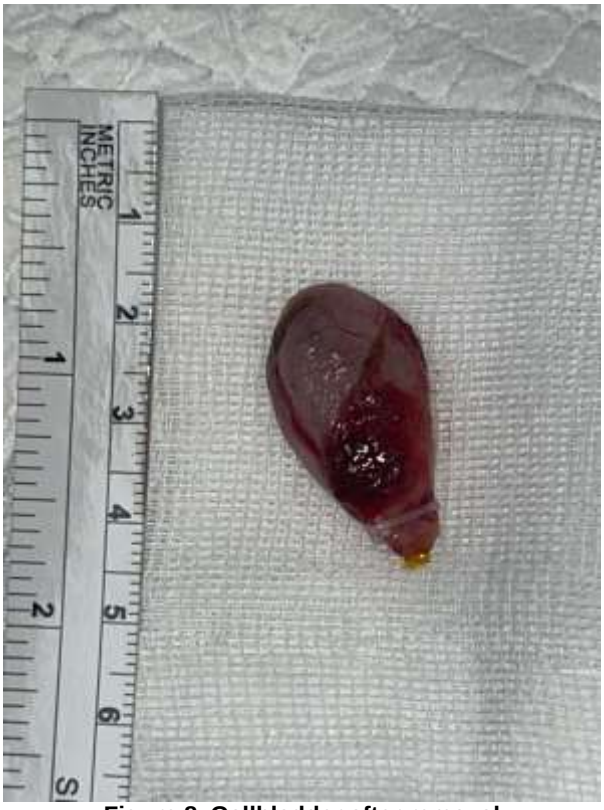

Figure 8. Gallbladder after removal

The next day after the surgery, the clinical signs started to regres and the pacient was fed with a syringe. The 2nd day after the surgery the pacient started eating by himself and on the 4th day his clinical state came back to normal, without any more vomiting, apathia or abdominal pain.

The ultrasound exams that followed showed only small signs of peritoneal inflamation

and a small quantity of free liquid. The blood analysis showed values getting slighly better such as CPL being 600 µg/L, CRP 70 mg/L or albumin 2.7 g/dL.

The 5th day after surgery the dog was discharged and at the 2 months re-check he was in normal clinical state and all the blood values came back to normal.

DISCUSSIONS

Ultrasound is an exam that can bring us many crucial information of the changes the patient suffers. It's advantages are the cost effectivness, the reduced time of a full abdominal exam or A FAST depending on the patients status and the low number of resources needed in realizing it. It is always indicated in such cases to have a serial ultrasound (every 4 or 8 hours when posible) to make the difference between an emergency and a non-emergency pathology.

From the sumary above, we can see that gallbladder oedema is a non specific sign without history of the patient and serial abdominal ultrasound. Cases with this kind of clinical signs need constant monitoring and extra laboratory or imaging exams for a better aproach. Only after 48 or 72 hours we can decide what are the best steps and what is the best treatement for the patient.

The patient presented the gallbladder oedema sign at 48 hours from admition. This showes us that altough the clinical signs and blood analyses are modified, the ultrasound changes are not always present and need time and multiple checks for them to apear. Cases like this can be missed if the ultrasound serial exam ins't taken into account.

Aproaching such cases with a good medical protocol is key in treating the patient. We need to have succesive steps in diagnosis and treatement. For this particular case gathering the information and starting a symptomatic treatement for stabilizing the patient had a major importance. Without these 1st steps, we couldn't reach the advance imagistic exams, surgery and having a final dignosis and also a treatment of the disease.

Clinical signs, ultrasound or blood analyses can only help us towards a presumtive diagnosis; the final diagnosis can only be made by laboratory exams suchs as histopatology from the walls of the gallbladder or in some cases bacteriological exams from the content. In this case we can see that the reasons of all this clinical signs was only known for sure after the histopathological dignosis of chronic limfoplasmocitar cholecystitis.

CONCLUSIONS

Gallbladder oedema can be caused by a large number of pathologies; an important aspect is to make the difference between emergency and non-emergency. The large range of clinical signs that can appear in this cases need a good protocol for the medic to eliminate every factor from the presumptive diagnosis. Most of the time when we encounter this sign or clinical signs associated to it, serial ultrasound examination is the key of evaluating the dynamic of the pathology.

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