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Atypical ultrasonographic features of a hepatic lobe torsion in a 2 years old Swiss White Shepherd

Case Reports

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Abstract

Background: Liver lobe torsion is uncommon in dogs, usually presented with acute non-specific clinical signs. It is commonly diagnosed at ultrasonographic examination, with increased size and hypoechogenicity of the torsed lobe, and lack of Doppler signal in its vessels.

Case description: A two years old White Swiss Shepherd was presented for acute vomiting and lethargy, without abdominal pain. The biological workup revealed dehydration, mild neutrophilia and lymphopenia, and signs of coagulopathy. An ultrasonographic examination led to a diagnosis of left lateral hepatic lobe torsion, with an unusual aspect: the torsed lobe was homogeneously hyperechoic. The diagnosis was confirmed surgically and at histopathologic examination. The dog's clinical evolution after lobar hepatectomy was good.

Conclusion: The unusual ultrasonographic features suggest that hepatic lobe torsion should be included in the differential diagnosis of hyperechoic hepatic lobar lesions. The satisfying clinical evolution also supports the fact that the outcome is good with early surgery.

Key words: Dog, Hepatic disease, Torsion, Acute , Hepatectomy

Introduction:

Liver lobe torsion is uncommon in dogs, with the left medial [1-5] and left lateral lobes being most commonly involved [2,4-6].

Affected dogs are usually of medium to large breeds and of variable age (5 months - 12 years) (all references). No sex predilection has been identified though males appear more frequently affected [1,2,4-9].

Early surgical intervention is recommended, as the venous obstruction results in hepatic necrosis and potential abscess formation [1,7,8], requiring early diagnosis whichmay be challenging,as the clinical presentation is not very specific (vomiting, lethargy, anorexia, abdominal pain) and often acute.

The diagnosis is usually obtained on ultrasound examination, in which the torsed lobe is reported to appear hypoechoic [1,2,4,5] or of mixed echogenicity with hypoechoic to anechoic areas [6,9] of normal to increased size, with a variable Doppler signal – usually decreased to absent [1-5].

In this report, we describe an unreported ultrasonographic feature of hepatic lobe torsion in a young male dog.

Case Details

Ultrasonographic findings

The ultrasonographic examination revealed a markedly hyperechoic left lateral liver lobe, which was slightly hyperechoic to the spleen (Figure 1). This lobe was displaced to the left, and surrounded by a marked amount of anechoic free peritoneal fluid (Figure 2). The size of this lobe was moderately increased, with a dilated portal system, severely thickened hepatic veins walls without Doppler flux, and dilated intrahepatic biliary tract (Figure 3). At the base of the lobe, there was an echoic element in the lumen of the hepatic vein then the lumen of the vessels brutally narrowed, circled by severely hyperechoic fat (Figure 4). The rest of the liver was normal in size and shape, with a slightly hypoechoic parenchyma. The aspect of the hepatic lymph nodes was within normal limits. These features were consistent with a left lateral hepatic lobe torsion.

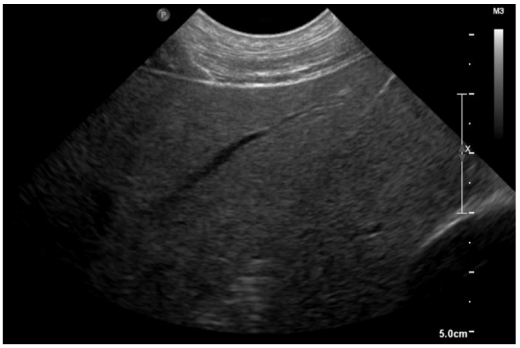

Figure 1: Ultrasonographic aspect of the left lateral liver lobe and spleen : the left lateral lobe of the liver (left side of the picture) is iso- to hyperechoic to the adjacent spleen (right side of the picture), and of increased size.

Figure 2: Peritoneal effusion surrounding the hypertrophic left lateral lobe : theextremityof the left lateral hepatic lobe is slightly rounded, surrounded by a moderate amount of anechoic fluid.

Figure 3a and 3b: Vascular abnormalities : thickened venous walls in the left liver lobe (3a) and absence of Doppler signal (3b).

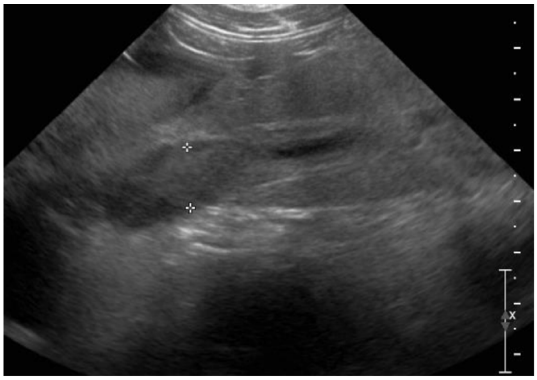

Figure 4: Torsion site : the wall of the hepatic vein is severely thickened, an echoic element is superimposed toits lumen, then the lumen brutally narrows, surrounded by hyperechoic fat.

The rest of the exam revealed a moderate mesenteric lymphadenopathy, with enlarged (13mm) hypoechoic mesenteric lymph nodes, most likely reactive to the peritoneal inflammation caused by the hepatic lobe torsion and the presence of free fluid. A concurrent enteropathy could not be excluded, particularly in the context of chronic digestive signs.

Additional analyses

The biochemical serum analysis was within normal limits.

The complete blood count revealed an increased haematocrit (65,3%, reference range 37,3-61,7%) that was interpreted as a hemoconcentration secondary to dehydration, and a slight modification in the white blood count ratio, with a mild neutrophilia (13,30 x 109 cells/L; reference range 2,95-11,64 x 109 cells/L) and a mild lymphopenia (0,96 x 109 cells/L; reference range 1,05-5,10 x 109 cells/L), with the total leucocyte count being in the upper part of the normal range (15,15 x 109 cells/L; reference range 5,05-16,76 x 109 cells/L).

There were signs of coagulopathy, with a thrombopenia (86 K/µL; reference range 148-484 K/µL) confirmed in the microscopic examination of the blood smear, and increased prothrombine and thromboplastine times (prothrombine time (PT) : 25 sec; reference range 11-17sec, activated partial thromboplastin time (aPTT) : >300 sec; reference range 72-102 seconds).

Treatment

Because of the coagulopathy, vitamin K1 and tranexamic acid were administered before the surgery. The dog also received isotonic fluid boluses and a constant rate infusion of fentanyl and lidocaine was added to the infusion.

The exploratory laparotomy confirmed the left lateral lobe torsion, and a lobectomy was performed using an ultrasonic dissector (Dissectron, Satelec Medical, Merignac, France) and an electric cautery. The presence of diffuse bleeding during the surgery motivated the realization of an intraoperative autotransfusion.

As the risk of gastric dilation-volvulus may be increased after a left hepatic lobectomy [4] a right incisional gastropexy was also performed.

Outcome and follow-up

The dog was clinically normal at every follow-up up to 30 days after the removal of the torsed lobe, and was still alive and in reported good health after 100 days.

Discussion

Among hepatic lobe torsions, the left lateral lobe is frequently involved [2,4-6]. Though the mechanisms remain unknown, it is hypothesized that the greater size and mobility of the left lateral lobe, hepatogastric ligament laxity, and factors of stretching of the left triangular ligament such as intermittent gastric gas distension may be predisposing factors [4,6].

The dog affected in this case was a large breed male. Although no sex predilection has been identified, males appear more frequently affected [1,2,4,5-9], along with large breeds, though the role of the animal'ssize in the pathogenesis of liver lobe torsion remains unclear.

As illustrated in this case, the diagnosis may be challenging as the clinical presentation is not very specific andoften acute. The biochemical and hematologic workup may rise suspicion towards a hepatic affection, then imaging techniques are required to establish the diagnosis.

On ultrasound examination, the torsed lobe is reported to appear hypoechoic [1,2,4,5], or of mixed echogenicity with hypoechoic to anechoic areas [6,9], of normal to increased size, with a variable Doppler signal – usually decreased to absent [1-5].The specificity of this case resides in the hyperechogenicity of the torsed lobe - a feature not described in the literature - though the histologic examination did not reveal unusual findings that could explain this variation in echogenicity.

Coagulopathy, encountered in our case, is rarely associated with liver lobe torsion.Reported abnormalities include thrombocytopenia [5,9] and increased fibrin split products [6] are reported. The reason for that coagulopathymayperipheral consumption of coagulation factors secondary to systemic inflammatory response, congestive insufficiency, or ascites-associated hyperfibrinolysis [10]. This suggests that a complete coagulation profile should be systematically obtained during the initial evaluation in order to prevent any complications.

Despite the bleeding complication during surgery that required a perioperative autotransfusion, the postoperative outcome wasgood for this case. Indeed, the prognosis is reported to be good with early surgery, with a survival of 11 of 13 cases in a retrospective case series [4], with an excellent long-term outcome for animals that survive thepostoperative period.

Conclusions

The unusual ultrasonographic features in this case suggest that hepatic lobe torsion should be included in the differential diagnosis of hyperechoic hepatic lobar lesions especially when associated with hyperechoic peripheral fat and regional free fluid. The satisfying postoperative evolution also supports the good reported outcomes with early surgery.

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