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Hyperechoic periportal cuffing as an ultrasonographic inflammatory sign in the abdominal pathology of canines

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Introduction

The echo-rich (hyperechoic periportal cuffing) appearance of the portal vein and its branches can be seen in different pathologies described in veterinary and human medical literature. Although periportal cuffing and the hyperechoic aspect of the perivascular portal tributaries can be connected with gastrointestinal disorders, the ultrasonographic sign can also be related with vascular pathology, without any signs of gastrointestinal disease, representing an important inflammatory sonographic marker.

Material and methods

Medical records were analyzed retrospectively in 125 dogs of different breeds and of both sexes, with different clinical signs (abdominal, neurological, systemic), between April 2022 and November 2022. For this, an ultrasound Esaote MyLab™Seven (Esaote, UK) device was used, with 2 transducers, convex and linear, with frequency adjusted according to the patient's size, clinical presentation and age. Complete abdominal ultrasound was performed on the included dogs, weighing between 5-25 kg, the population being represented by 87 males and 38 females, aged between 8 months and 13 years.

Hyperechoic periportal cuffing highlighted by abdominal ultrasonography and complete blood tests sets, including measuring of the C reactive protein were the inclusion criteria. Confirmed diagnoses included 25 cases of acute pancreatitis; 5 cases of necrotizing pancreatitis; 8 cases of acute hepatitis; 5 cases of cholecystitis; 7 cases with portosystemic shunts; 24 cases of portal hypertension; 25 cases with gastroenteritis; 9 cases of colitis and 17 cases diagnosed with intra-abdominal neoplasia.

Conclusion and discussion

Periportal cuffing of the liver is an ultrasonographic sign seen more frequently in cases of abdominal inflammation, in which the diseases are heterogeneous and most commonly arise from the liver or the gastrointestinal tract. Hyperechoic periportal cuffing may result from liver inflammation that occurs in inflammatory bowel disease secondary to the abnormal cell passage from the intestinal mucosa into the portal system via enterohepatic circulation, described mostly in human medicine. Also, the ultrasonographic signs has been reported and associated with hepatobiliary diseases, primary sclerosing cholangitis, acute cholecystitis, in chronic hepatitis and pancreatitis , in both humans and dogs. Thickening in the periportal area may occur as well with proliferation of the bile ducts, haemorrhage, oedema, fibrosis, inflammatory changes (acute and chronic hepatitis) or a combination of these. It is important to know that a normal hepatic echotexture does not exclude the diagnosis of acute hepatitis, and in most cases the liver will have a normal sonographic appearance. In some cases of chronic hepatitis, fibrosis of the liver can cover the portal vein walls, changes seen in dogs with a heterogeneous echogenicity of the liver parenchyma, hyperechoic appearance and diffuse enlargement with ill-defined edges.

In human medicine, gallbladder lithiasis can be accompanied by the appearance of a periportal cuffing, which was not found in dogs. Instead, neoplastic infiltration of the liver parenchyma seen with lymphoma and different type of round cell tumours can cause the appearance of hyperechoic portal walls, in both humans and canines, most likely due to generalised decrease of the liver echogenicity. In this study, portal tributaries hyperechoic appearance and periportal hyperechogenicity in dogs, was also seen in cases of portal hypertension (hepatic, pre and post hepatic), neoplasia and in cases of congenital or acquired portosystemic shunts; however, these aspects were not described in the literature. The changes are potentially related with systemic inflammation, increased pressure within the portal lumen and vasculitis. In all the cases where the hyperechoic periportal cuffing has been recorded, levels of C-reactive protein were moderately elevated, which can strengthen the association of the periportal cuffing as an inflammatory sonographic marker. The article aims to present changes in the portal vasculature seen in dogs with abdominal pathology and the importance of identifying hyperechoic periportal cuffing as an inflammatory marker of the vasculo-abdominal pathology. Furthermore, a periportal cuffing ultrasound and a hyperechoic appearance of the portal vasculature in absence of any other major abdominal ultrasound findings, it should guide us to a different approach of the examination, portal hypertension, vasculitis, neoplasia and vascular abnormalities being involved in the systemic changes of the portal vessels ultrasonographic aspect. The disadvantage of this study is that it was performed on a small group of animals, so detailed future studies on a larger number of animals are needed.[1-15]

Acknowledgments

None.

Conflicts of interest

None.

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