CORRELATION BETWEEN SONOGRAPHIC HONEYCOMB APPEARANCE OF THE SPLEEN AND CYTOLOGIC OR HISTOLOGIC DIAGNOSES IN A FELINE POPULATION

DOTTORATO DI RICERCA IN SCIENZE VETERINARIE - XXXI° CICLO

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INTRODUCTION / PURPOSE

Honeycomb pattern (HCP) is a sonographic splenic disorder characterised by a general diffuse inhomogeneity with multiple hypoechoic foci less than 1 cm in diameter. A positive predictive value of HCP for canine lymphoma has been demonstrated, while in cats literature regarding HCP is lacking.
The purpose of this study was to assess the correlation between a splenic sonographic HCP and the final cytological or histological diagnosis, in a feline population.
In addition we want to determine whether the use of a high-frequency linear transducer may positively affect the HCP visualization.

METHODS

Medical records of cats with a sonographic splenic HCP were retrospectively searched for those having a complete abdominal ultrasound and the availability of cytological or histological samples of the spleen.
All stored images and videos were evaluated by the same experienced operator in order to describe the splenic appearance. For each case, the following sonographic signs were evaluated: size, shape, margin appearance, presence of parenchymal alterations other than HCP and splenic hilar lymphadenopathy. For those cases where images obtained by both linear and curvilinear transducers were available, a comparison was made in order to assess whether the HCP was more recognizable on higher resolution images. The cyto-histopatologic review was performed by a pathologist and a clinical pathologist together and the final diagnosis was made by consensus. In the presence of a cytological suspect of lymphoma, diagnosis was confirmed with clonality testing by polymerase chain reaction to identify antigen receptor rearrangements (PARR) in the T-cell or B-cell receptor genes.

RESULTS

Twenty-four cats were included in the study. Histological samples were available in 5 cases, allowing to diagnose 1 splenic histiocytosis, 1 cryptococcal granulomatous splenitis, 2 lymphoid hyperplasia and one small B cell lymphoma. The remaining 19 cases underwent cytological examination, resulting in the following diagnoses: extramedullary hematopoiesis (n = 2), neutrophilic splenitis (n = 4), LGL lymphoma (n = 1) and lymphoid hyperplasia/lymphoma (n = 12). In these latter cases, PARR confirmed the presence of lymphoma in 6 cases (4 T cell and 2 B cell in origin) and of lymphoid hyperplasia in the other 6. HCP was evident in overall images acquired with a high-resolution linear array, while it was less apparent in 13/24 cases on the microconvex-acquired images (Figure 2). The most common sonographic feature associated with HCP in the present study was splenomegaly, observed in 100% of the cats with lymphoma and in 56% of the cats with other splenic disorders.

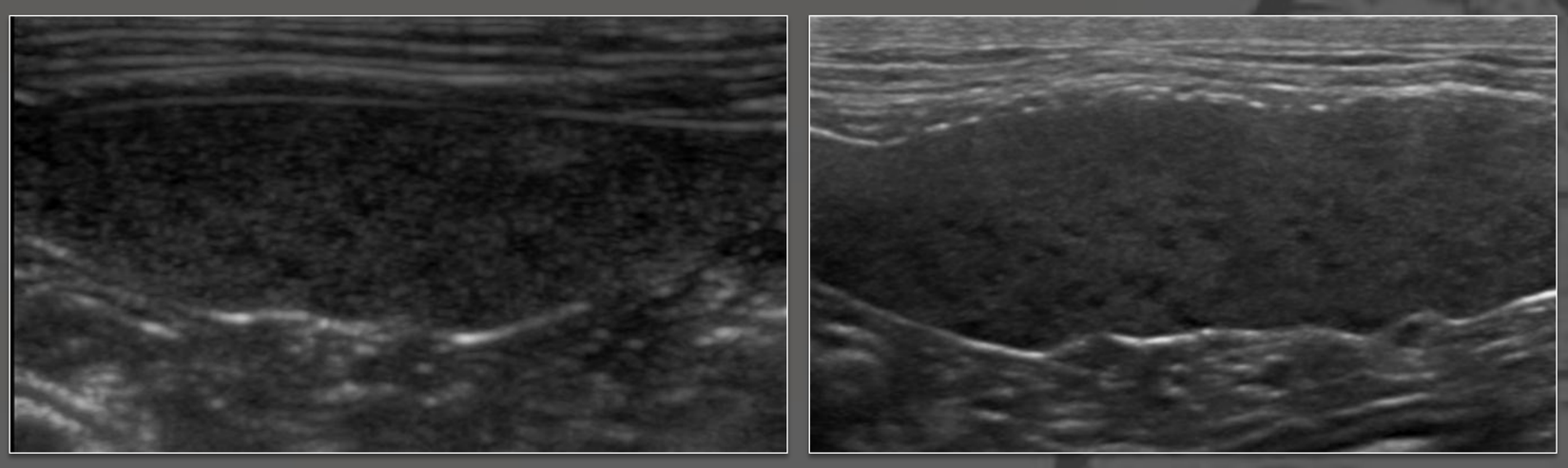

Figure 1 – Sonographic images of two feline spleens showing a HCP. Final diagnosis were B cell lymphoma (A) and neutrophilic splenitis (B), respectively. In both cases splenic parenchyma appears inhomogeneous with multiple small hypoechoic foci.

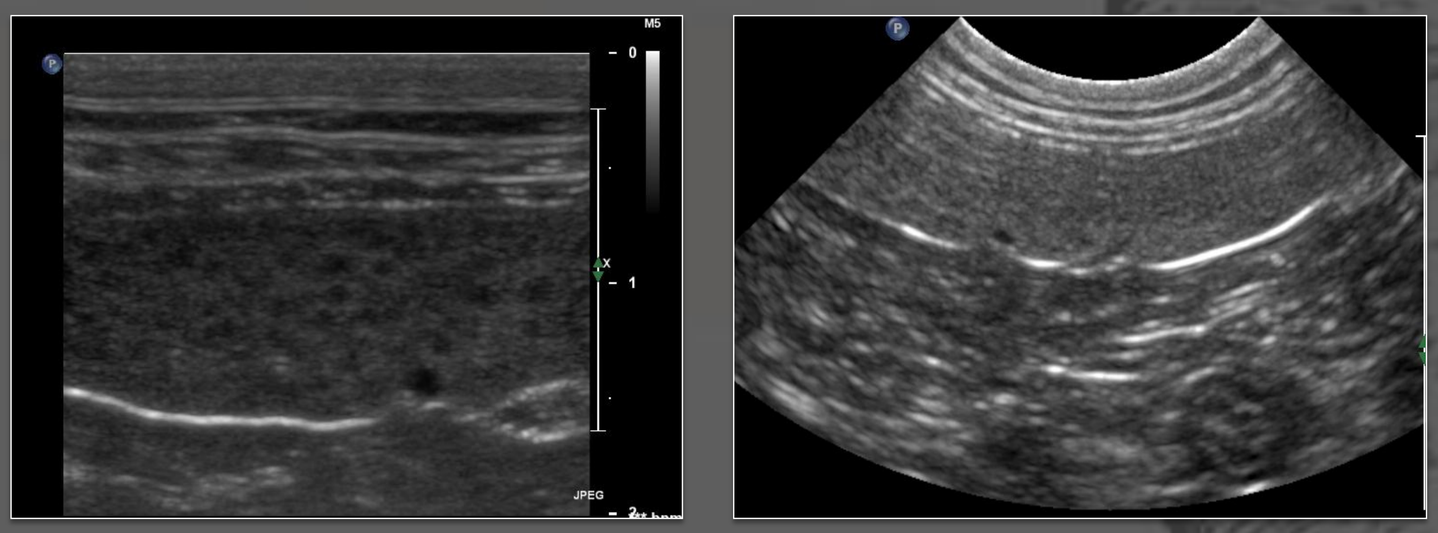

Figure 2 – Comparison between sonographic images of a feline spleen obtained with linear and curvilinear arrays. HCP is well recognizable on the high-frequency image (C) in contrast with the image obtained with the microconvex probe (D) where only a slight inhomogeneity of the splenic parenchyma is visible. Final diagnosis was lymphoid hyperplasia.

DISCUSSION AND CONCLUSIONS

In contrast with data previously reported in the dog we found that splenic HCP is not pathognomonic of lymphoma, as it is associated to both benign and malignant disorders with no significant difference in frequency. Therefore, according to our findings when a HCP is detected on ultrasound examination further investigations (cytology or histology) are required to achieve a final diagnosis. In addition according to the present study results, high frequency transducers are valuable in the detection of HCP and should always be used in the sonographic assessment of the splenic parenchyma.

PUBLICATIONS

Guglielmini C, Baron Toaldo M, Quinci M, Romito G, Luciani A, Cipone M, Drigo M, Diana A. "Sensitivity, specificity and interobserver variability of thoracic radiography in the detection of heart base mass in dogs". J Am Vet Med Assoc, 2016 vol 248: 1391-8.

Linta N, Baron Toaldo M, Bettini G, Cordella A, Quinci M, Pey P, Galli V, Cipone M, Diana A. "The feasibility of contrast enhanced ultrasonography (CEUS) in the diagnosis of non-cardiac thoracic disorders of dogs and cats". BMC Vet Res, 2017 DOI 10.1186/s12917-017-1061-0.