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Cytological and histological differential diagnosis in case of spleen masses

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Abstract: Hemangiosarcoma is an aggressive and malignant tumor that arises from the endothelial cells lining blood vessels. It is most commonly found in the spleen, heart, liver, and skin of dogs. This cancer is highly invasive and prone to metastasis, often spreading to the lungs, liver, or other organs. Since hemangiosarcoma grows silently, clinical signs usually appear only in advanced stages. Due to its aggressive nature, early detection and thorough diagnostic eval-uation are critical. Also, knowing the nature of the formations existing on the spleen is important for treatment and measures taken after its surgical removal. The aim of the study was cytological and histological differential diagno-sis for spleen masses detected by ultrasound.

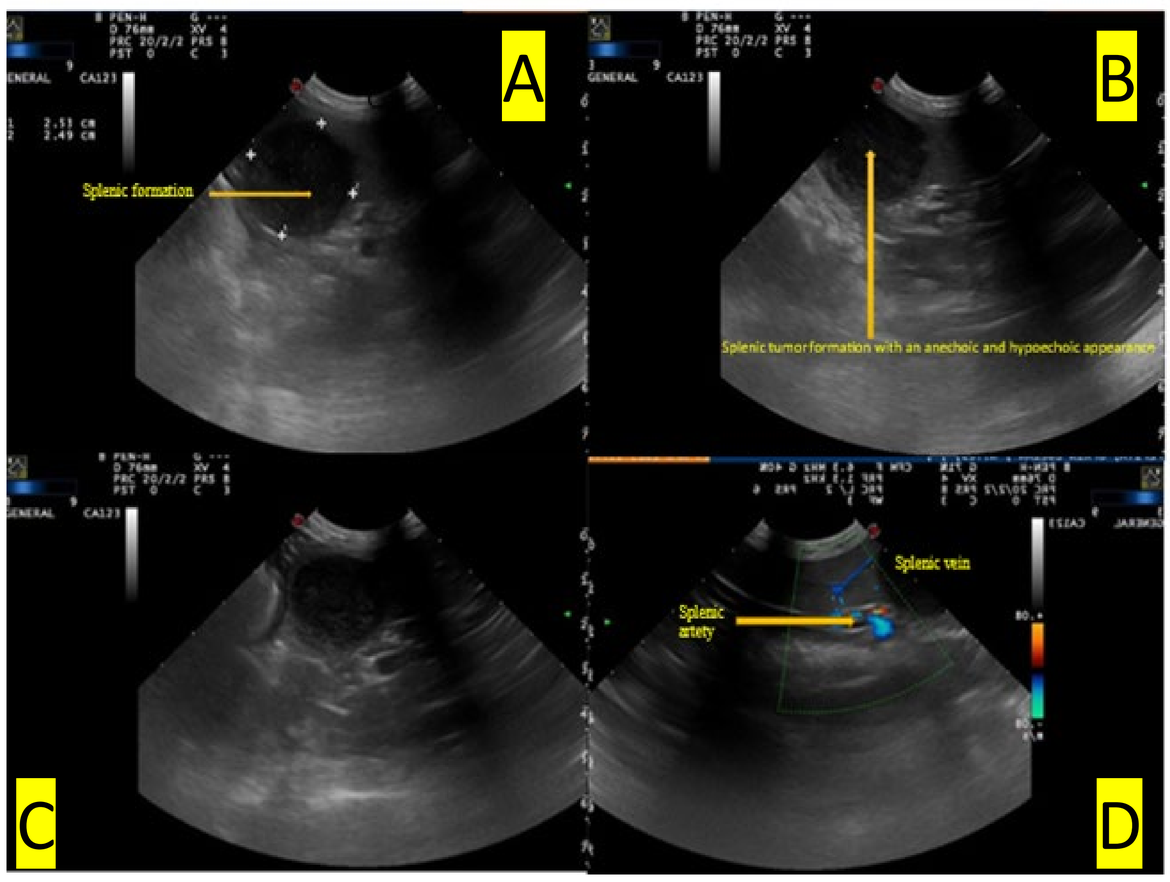
• Introduction

Hemangiosarcoma (HSA) is a malignant vascular tumor frequently affecting the canine spleen, with a high prevalence in large breeds and neutered males (Mulin & Clifford, 2020; Johnson et al., 1989). According to the "two-thirds rule," most splenic tumors are malignant, and the majority of these are HSAs (Corbin et al., 2017; Davies & Taylor, 2020). Although its exact origin remains uncertain, HSA may arise from pluripotent bone marrow cells and is potentially associated with chronic Bartonella infections, which promote angiogenesis and inflammation (Giuffrida et al., 2017; Lashnits et al., 2020).Metastasis, particularly to the liver, is common and significantly influences prognosis. This study reports the histopathological evaluation of splenic masses from two nine-year-old small-breed dogs—a female Cocker Spaniel and a male Bichon—contributing to the understanding of HSA in less commonly affected breeds.

• Material and method

Ultrasound examinations were conducted using a My Lab 70 stationary scanner equipped with a 4.5 MHz microconvex multifrequency probe. The dogs were prepared by clipping the ventral abdominal area, applying alcohol for disinfection, followed by ultrasound gel. B-mode and color Doppler imaging were employed for diagnostic visualization (Figure 1 A–D).Cytological evaluation was performed via fine-needle aspiration, with smears stained using the Diff-Quik method. Microscopic analysis was carried out using an Olympus CX41 microscope equipped with a digital camera and QuickPHOTO Micro 2.2 image analysis software.For histological analysis, splenic tissue samples obtained surgically were fixed in 80% ethanol, paraffin-embedded, and sectioned at 5 µm using a Cut 4062 Slee Mainz microtome. The sections were stained using Hematoxylin and Eosin and examined under the same Olympus CX41 microscope setup.

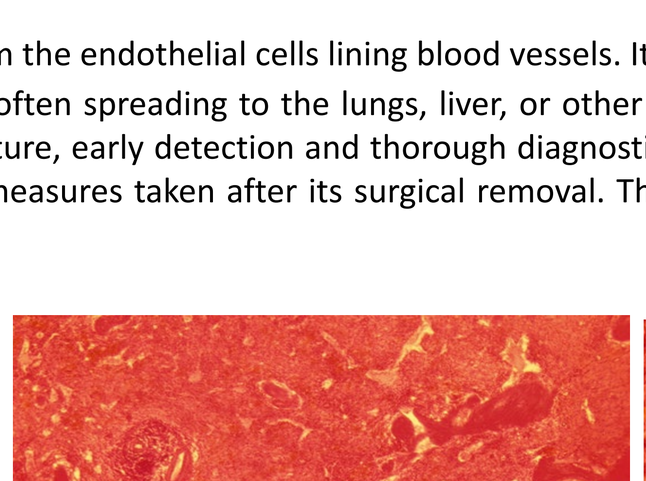
• Results and discussions



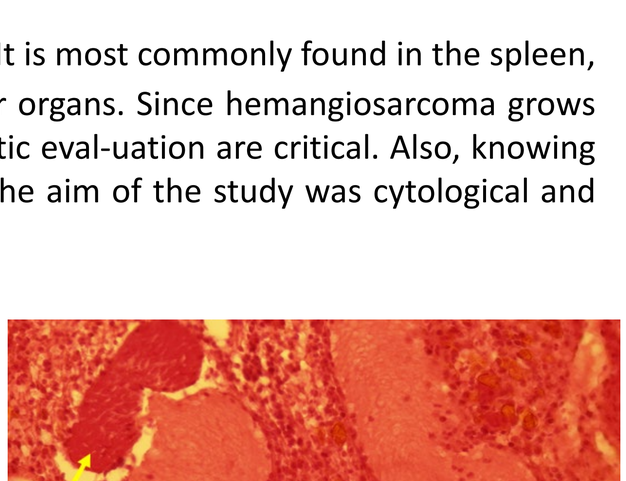
A- Splenic image with evidence of a circular formation in the spleen mass (examination mode B, sagittal section), B, C- Splenic image with evidence of a circular, anechoic formation with hypoechoic structure in the spleen mass (examination mode B, sagittal section), D- Image of the spleen with evidence of the caudal vena cava and intrasplenic venous structures (Doppler mode, sagittal section).

Histological section from the spleen of a Cocker spaniel female: irregularly shaped vascular spaces in the parenchyma (→), H.E. stain, 100X.

Histological section from the spleen of a Cocker spaniel female: trabecular connective structures (→), H.E. stain, 100X.



Histological section from the spleen of a Cocker spaniel female: very small lymphoid follicle (→), H.E. stain, 100X.



Histological section from the spleen of a Cocker spaniel female: thickened walls of the lymph node metarterioles (→), H.E. stain, 200X.

• Conclusions

- The cytological examination carried out in the case of hemoabdomen by intraperitoneal puncture did not reveal the presence of tumour cells, but provided other data on the general appearance of the erythrocytes, which may indirectly suggest the presence of a neoplastic process. The lesions identified in the spleen by histological examination, which confirmed the diagnosis of haemangiosarcoma, can be classified as severe and aggressive lesions, and the prognosis is therefore of a high order. Knowledge of the type of disease affecting the spleen is important for treatment and preventive decisions and measures after surgical removal of the spleen. This study is relevant to the understanding and management of splenic hemangiosarcoma in dogs and provides valuable insights into the risk factors and incidence of this disease.