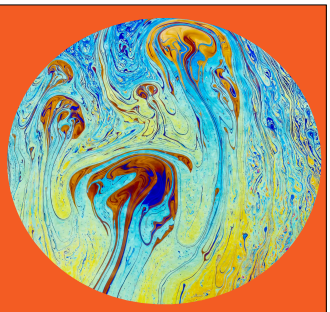
Milza sospetta, linfonodi irregolari, masse addominali: cosa posso dire davvero con l'ecografia?



Giliola Spattini
DVM, GP cert Cardio, CCRT, PhD, DECVDI

Diagnostic Mindset

Clinica Veterinaria CASTELLARANO

Objectives

- The spleen and the LNs can be challenging
- How do we define what is normal?

Asso, Whippet, MI, 3 years

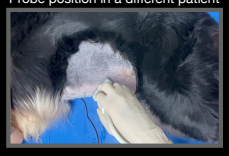
- Acute vomiting
- Destroyed a toy
- Suspected FB ingestion

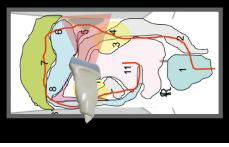
Asso, Whippet, MI, 3 years

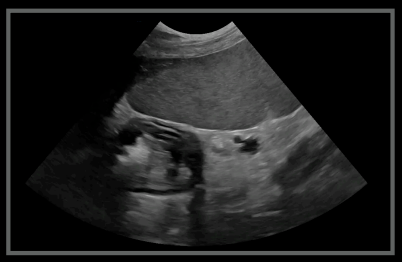
Rule out FB ingestion

Probe position in a different patient

5





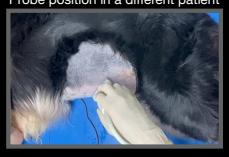


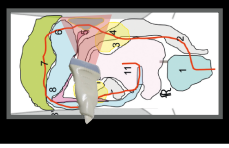
Asso, Whippet, MI, 3 years

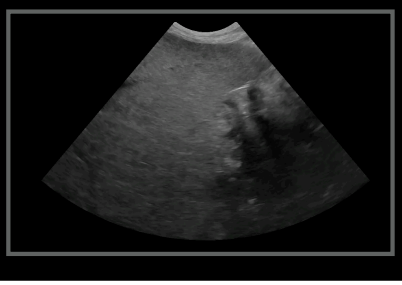
Rule out FB ingestion

Probe position in a different patient

5







Your evaluation

Big breed big spleen

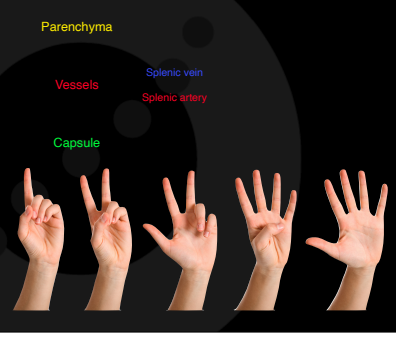
Be careful to use the words splenomegaly in dogs

Asso, Whippet, MI, 3 years

- Unremarkable spleen for the breed

Spleen

1. Margin
2. Number
3. (O) Parenchyma
4. Position
5. Size
6. Shape
7. Vascularisation
8. Surrounding peritoneum



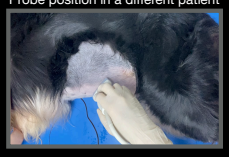
Emo, English Setter, MI, 7 years

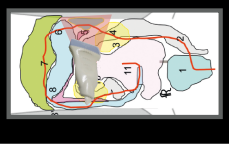
- Lethargy
- Anorexia
- Abdominal pain
- Dyspnea

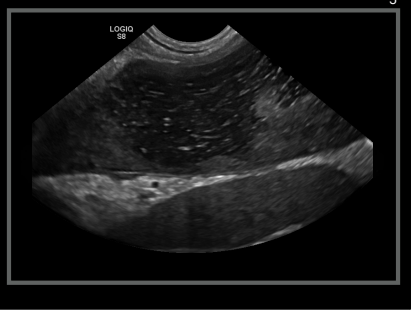
Emo, MI, 7 years

Probe position in a different patient

5



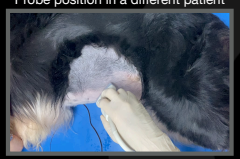


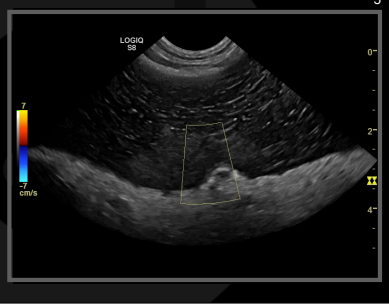


Emo, MI, 7 years

Probe position in a different patient

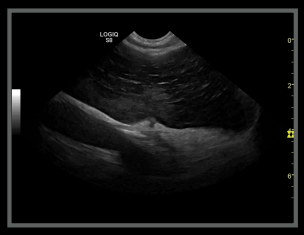
5

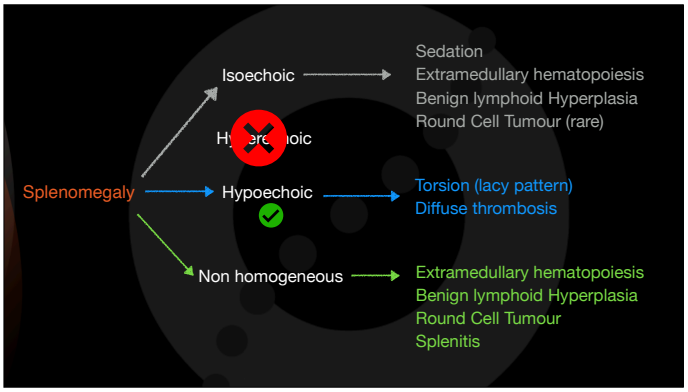




Emo, English Setter, MI, 7 years

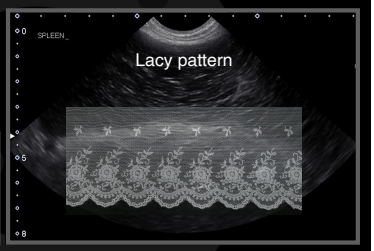
Splenic echostructure:	Coarse
	Homogeneous
Splenic echogenicity:	Uniformly Reduced
	Hyperechoic surrounding peritoneum
Size:	"Enlarged"





Emo, English Setter, MI, 7 years

- Diffuse, large, hypoechoic spleen surrounded by scattering artifact
- Splenic torsion vs infarct
- Surgery!!

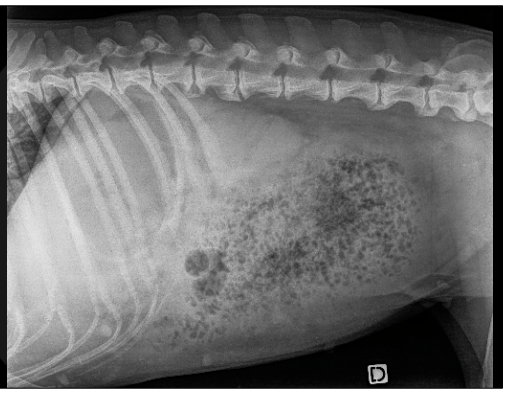


Lu, Malinois, FI, 5 years

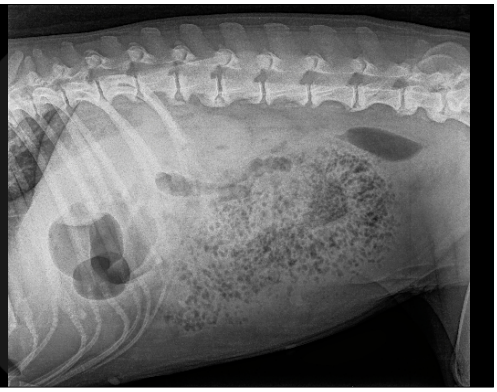
- Anorexia
- >TRC
- Tachicardia
- 40,2°

Courtesy of Dr Liotta

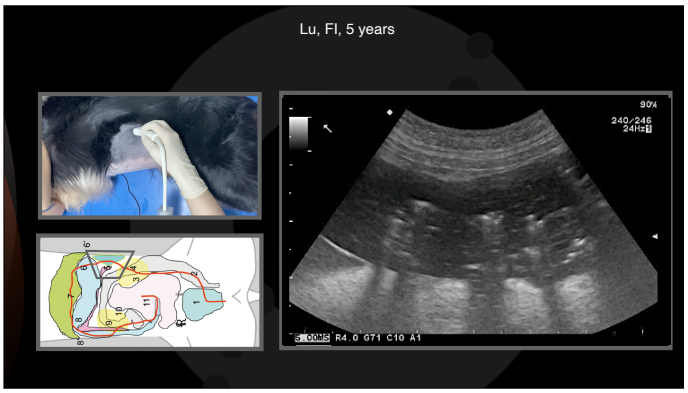
Lu, FI, 5 years

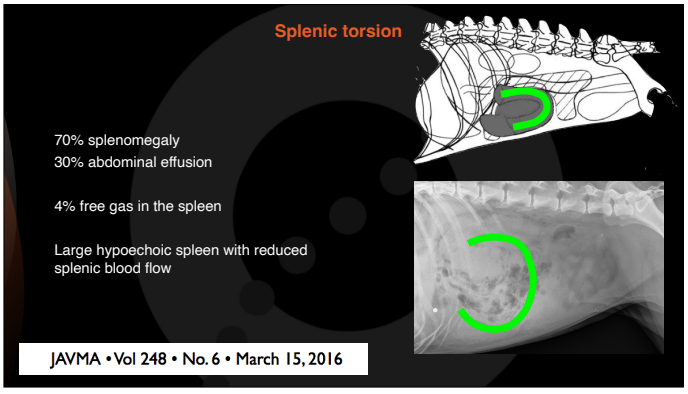


Lu, FI, 5 years




Lu, FI, 5 years


Lu, FI, 5 years


Splenic torsion
70% splenomegaly
30% abdominal effusion
4% free gas in the spleen
Large hypoechoic spleen with reduced splenic blood flow
JAVMA • Vol 248 • No. 6 • March 15, 2016

Splenic torsion

Life-threatening condition

Primary splenic torsion in dogs: 102 cases (1992–2014)

Table 3—Results of multivariate logistic regression analysis of risk factors associated with death prior to hospital discharge in dogs (n = 102) undergoing surgery because of PST.

Risk factor	OR (95%CI)	Wald *P* value
Preexisting septic peritonitis	32.4 (2.1–502.0)	0.013
Intraoperative hemorrhage	22.6 (1.8–289.8)	0.016
Postoperative respiratory distress	35.7 (2.7–466.0)	0.006
Weight (>10 kg)	1.6 (0.7–3.2)	0.236

Weight was a confounding variable. Hosmer-Lemeshow goodness-of-fit $P = 0.630$ (8 degrees of freedom).

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Rotation of the spleen around the gastrosplenic and phrenosplenic ligaments leading to occlusion of venous drainage and arterial supply

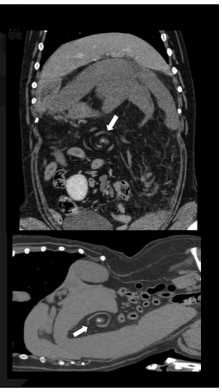
Spenectomy favorable prognosis

Splenic torsion

CT characteristics of primary splenic torsion in eight dogs

Jonathan R. Hughes[1] | Victoria S. Johnson[2] | Marie-Aude Genain[1]

Whirl sign alongside a strongly hyperattenuating center on the pre and post contrast images



Vet Radiol Ultrasound. 2020;1–8.

Emphysematous splenitis

Spontaneous emphysematous splenitis: Radiographic and ultrasonographic findings in three Golden Retriever dogs

Pierantonio Battilato[1,2] | Yordan Fernandez[1] | Raquel Salgüero[2] | Rosa Novellas[1] | Yvonne Espada[1] | David Biller[3] | Carlo Anselmi[1]

- Mass effect
- Vesicular-like gas pattern
- Focal loss serosal detail

Vet Radiol Ultrasound. 2020;1–7.

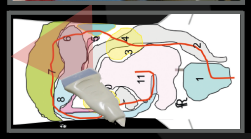
Stella, Bloodhound, FS, 14 years

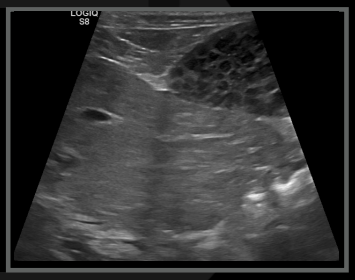
- Weakness
- Dysorexia
- Abdominal pain

Stella, FS, 14 years

Probe position in a different patient

6 - 5

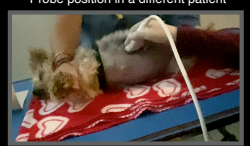


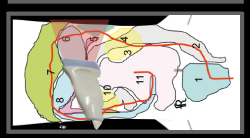


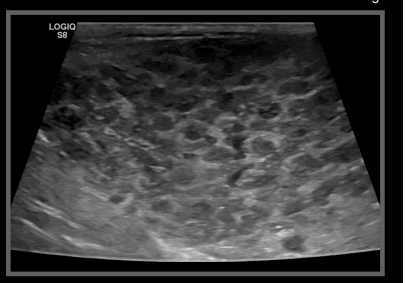
Stella, FS, 14 years

Probe position in a different patient

5







Emo, English Setter, MI, 7 years

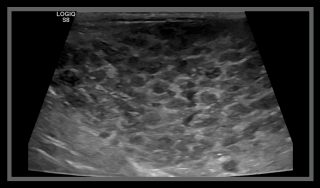
Splenic echostructure: Coarse

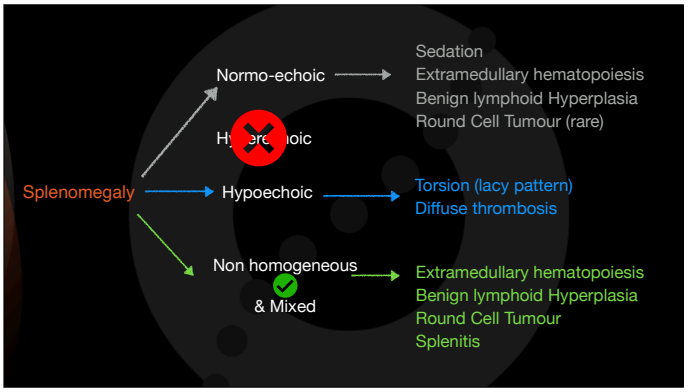
Non homogeneous

Splenic echogenicity: Mixed

Unremarkable surrounding peritoneum

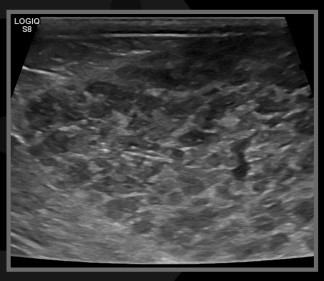
Size: "Enlarged"





Stella, FS, 14 years

- Honeycomb parenchymal pattern
- Increased splenic size



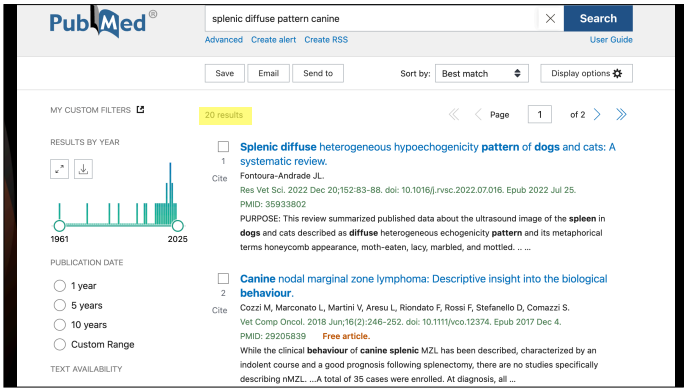
Stella, Bloodhound, FS, 14 years

Ultrasonographic diagnoses:

- Splenopathy
- Hepatopathy
- …

How to arrive to Conclusions:

- Physical examination
- Blood works
- Ultrasonographic findings
- Literature



Splenic diffuse heterogeneous hypoechogenicity pattern of dogs and cats: A systematic review

Research in Veterinary Science 152 (2022) 83–88

José Luiz Fontoura-Andrade

Seção de Cães de Guerra, Batalhão de Polícia do Exército de Brasília, Av Duque de Caxias s/n SMU, Brasília, DF 70630-100, Brasil

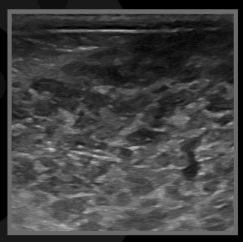
Conclusions: The use of more precise descriptors, such as diffuse heterogeneous echogenicity pattern, reticular or reticular-nodular pattern, is preferred over metaphorical terms such as lacy, moth-eaten, mottled, or marbled pattern. Discrete diffuse heterogeneous splenic echogenicity patterns can be missed if ultrasonographic examinations are conducted with lower-frequency transducers. Although healthy puppies or patients with various morbidities may present the diffuse heterogeneous splenic echogenicity pattern, higher prevalences were reported in canine patients with natural infection by Babesia canis and *Ehrlichia canis*.

The reticular pattern is the ultrasound visualization of the image of numerous hypoechoic lines with a mesh appearance. This term is derived from the Latin words *reticulum* or *reticulus*, meaning "net with small meshes". The reticulonodular pattern refers to an image in which there is an overlap of reticular shadows with nodular shadows or well-defined hypoechoic nodules. Some studies differentiated the image described as mottled from that described as lacy for the same disease, whereas others grouped all patients under the more generic descriptive term "pattern of diffuse splenic heterogeneous echogenicity". When

Stella, Bloodhound, FS, 14 years

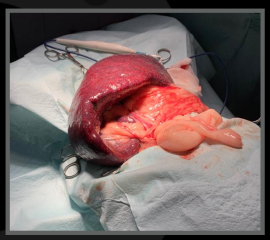
Conclusions:

- Honeycomb (reticulonodular) pattern
- Vascularisation WNL
- From unremarkable to mild surrounding peritoneal hyperechogenicity

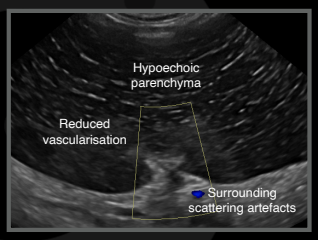


Stella, Bloodhound, FS, 14 years

- Surgical removal
- Histological diagnosis of chronic splenic leukaemia
- Survived 6 months with palliative treatment



Key points



Honeycomb or reticulonodular pattern

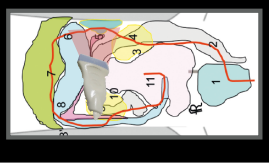
Lacy or reticular pattern

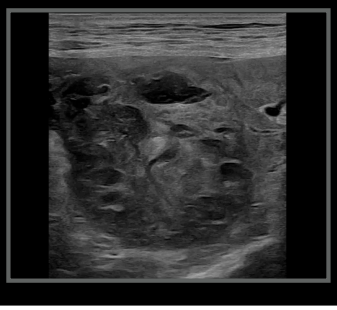
Argo, Mongrel, MN, 11years

- Weakness
- Reduced appetite
- Loosing weight

Argo, MN, 11 years

Probe position in a different patient





Argo, Mongrel, MN, 11years

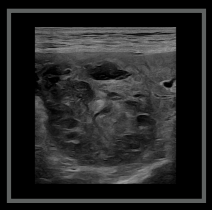
Lesion echostructure: Coarse

Non homogeneous

Lesion echogenicity: Mixed

Focally hyperechoic surrounding peritoneum

Capsular engagement: Yes



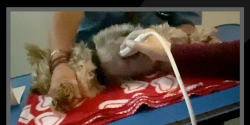
Splenic lesion

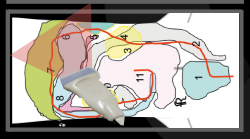
- Isoechoic → Regenera[l] nodule; Early [l]comas — You can wait!
- Hyperechoic → Myelolipom[a]; Benign[ ]ular hyperplasia; Ex[t]edullary hemopoiesis — Benign unless proven
- Hypoechoic → Hematoma; Metast[a]; Reg[e]erative [n]odule — Don't know
- Anechoic → Cyst; Ab[s]ess — Better to check
- Mixed → Hema[n]sarcoma — Urgent to remove!

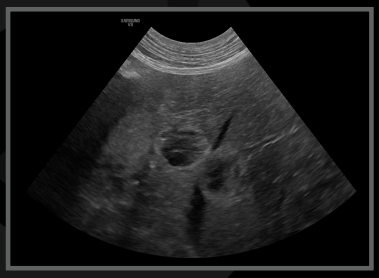
Argo, MN, 11 years

Probe position in a different patient

6 - 7

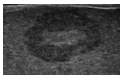






Target lesions

CELLULAR FEATURES OF SONOGRAPHIC TARGET LESIONS OF THE LIVER AND SPLEEN IN 21 DOGS AND A CAT



ALESSANDRA CUCCOVILLO, CHRISTOPHER R. LAMB

Target lesions are seen in ultrasound images of the liver or spleen as nodules or masses with a hypoechoic rim and a hyperechoic or isoechoic center. To assess the diagnostic significance of finding a target lesion, the cytologic and/or histopathologic findings were reviewed in a series of 21 dogs and a cat that had hepatic and/or splenic target lesions noted during abdominal ultrasonography. Twelve of 16 hepatic target lesions and 5 of 7 splenic target lesions were malignant. In this series, the finding of one or more target lesions in the liver or spleen had a positive predictive value for malignancy of 74%; for the finding of multiple target lesions in one organ, the positive predictive value for malignancy was 81%. Benign lesions associated with target lesions were nodular hyperplasia of the liver and spleen, pyogranulomatous hepatitis, cirrhosis, and chronic active hepatitis. *Veterinary Radiology & Ultrasound, Vol. 43, No. 3, 2002, pp 275–278.*

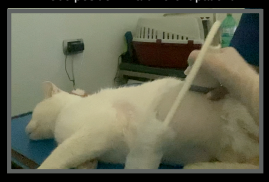
Argo, Mongrel, MN, 11 years

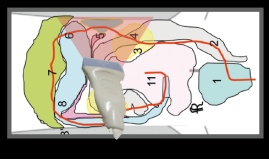
- Surgical splenic removal
- Hemangiosarcoma on histology
- Hepatic metastasis
- 5 months survival

Bill, DSH, MN, 14 years

- Loosing weight
- Poor coat
- A large nodule palpated in the thyroid region

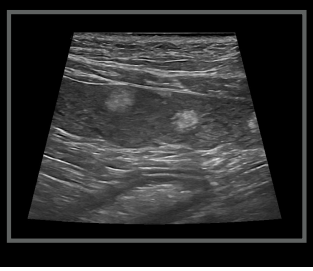
Probe position in a different patient





Argo, MN, 11 years

5



Splenic lesion

- Isoechoic → Regenerative nodule, Early sarcomas
- Hyperechoic → Myelolipoma, Bengin nodular hyperplasia, Extramedullary hemopoiesis
- Hypoechoic → Hematoma, Metastasis, Regenerative nodule
- Anechoic → Cyst, Abscess
- Mixed → Hemangiosarcoma

Bill, DSH, MN, 14 years

Ultrasonographic diagnoses:

- Multifocal hyperechoic nodular lesions
- Splenopathy

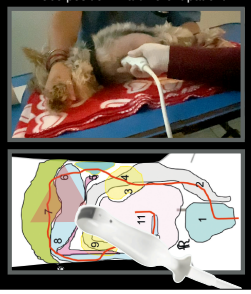
Final diagnosis: granulomas, suspected of parasitic origine

Bracco, Doberman, MI, 4 years

- One month of diarrhoea, now hemorrhagic, dark faeces
- Vomiting, some blood in it
- Diagnosed with lymphoma by an abdominal ultrasound

Bracco, MI, 4 years

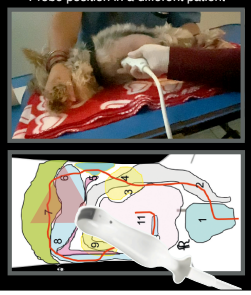
Probe position in a different patient



7 trans

Bracco, MI, 4 years

Probe position in a different patient



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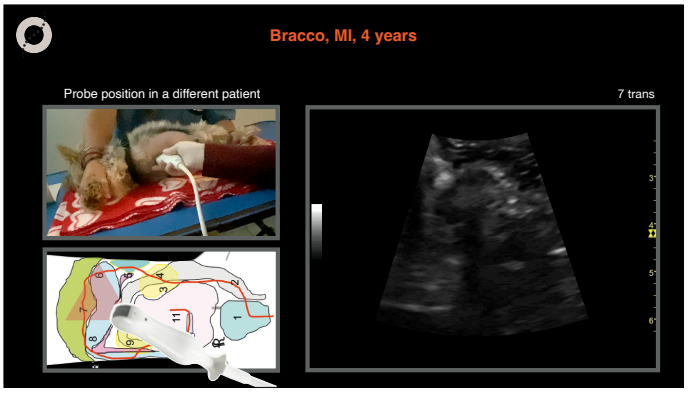
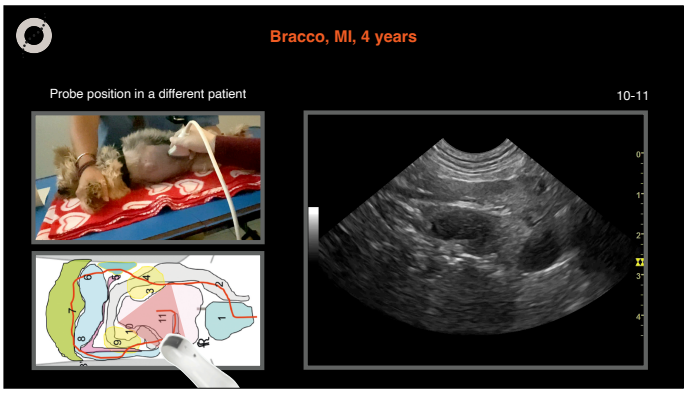
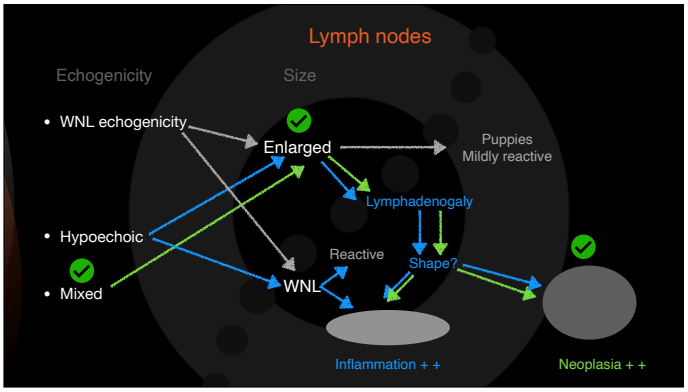

Bracco, MI, 4 years
Probe position in a different patient
7 trans


Bracco, MI, 4 years
Probe position in a different patient
10-11


Lymph nodes
Echogenicity
Size
• WNL echogenicity
• Hypoechoic
• Mixed
Enlarged
Puppies
Mildly reactive
Lymphadenogaly
Reactive
WNL
Shape?
Inflammation + +
Neoplasia + +

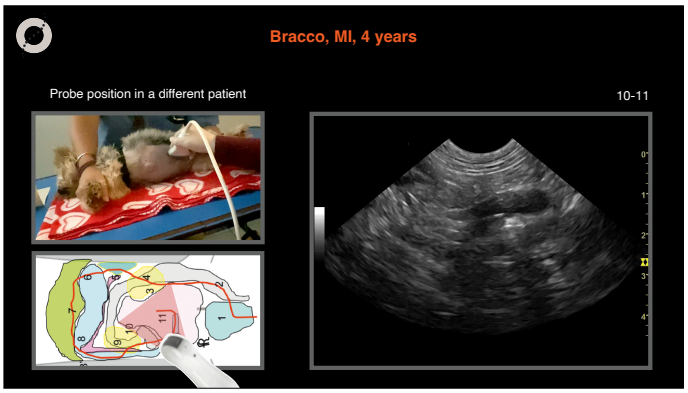
The Sonographic Evaluation of Lymph Nodes

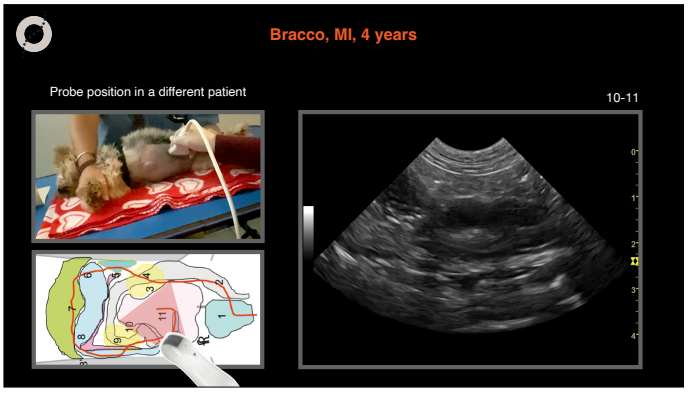
Helena T. Nyman, DVM, MSc, PhD* and Robert T. O'Brien, DVM, MS, DACVR†

Ultrasound can be used to detect and evaluate both normal and abnormal lymph nodes, as well as aid in biopsy sampling procedures, an important part of staging procedures in cancer patients. Several parameters can be evaluated using ultrasound; lymph node size, margins, echogenicity, echopattern (echotexture), acoustic transmission, presence and distribution of vascular flow, and vascular flow indices. The most diagnostically helpful include the short/long axis ratio of the lymph node, the pattern of distribution of the blood vessels within the lymph node, and to some extent the resistive and pulsatility indices. This review discusses the use of ultrasound for detecting, evaluating, and sampling peripheral, abdominal and thoracic lymph nodes in small animals.

Clin Tech Small Anim Pract 22:128-137

	Malignant Lymph Nodes	Benign Lymph Nodes
S/L axis	>0.7	<0.7
Hilus	Narrow or absent	Usually present
Echogenicity	Often hypoechoic	Isoechoic
Blood flow distribution	Primarily peripheral or mixed	Hilar



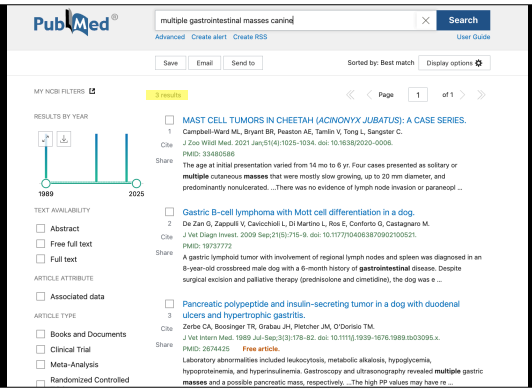


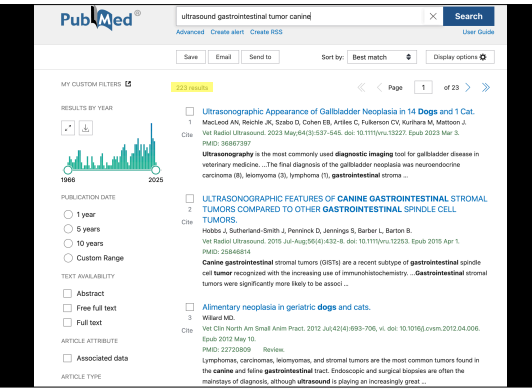
Bracco, Doberman, MI, 4 years

Ultrasonographic diagnoses:

- Focal gastric thickening
- Mesenteric lymphomegaly - nodular lesions
- Intramural, asymmetric, concentric colonic mass

Two GE lesions





DIAGNOSTIC VALUE OF ULTRASONOGRAPHY IN DIFFERENTIATING ENTERITIS FROM INTESTINAL NEOPLASIA IN DOGS

Veterinary Radiology & Ultrasound, Vol. 44, No. 5, 2003, pp 570–575.

DOMINIQUE PENNINCK, DVM, DVSc, BETHANY SMYERS, BS, CYNTHIA R.L. WEBSTER, DVM, WILLIAM RAND, PhD, ANTONY S. MOORE, BVSc, MVSc

Parameter	Enteritis	Neoplasia
Medium wall thickness	6 mm	15 mm
Loss wall layering	11%	99%
More than 1 lesion	72%	2%
Decreased regional motility	61%	87%

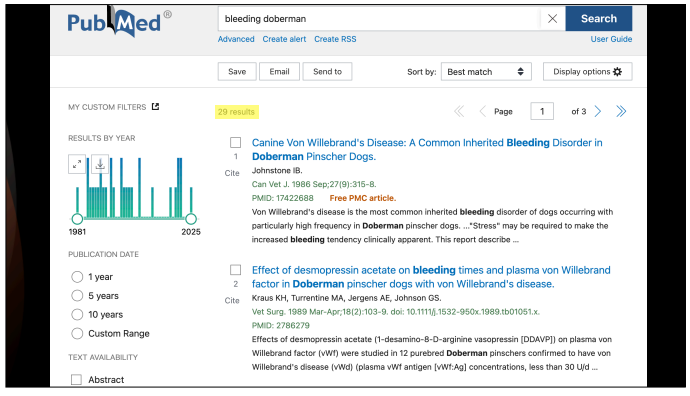
How to arrive to Conclusions:

- PE examination
- Blood works
- Ultrasonographic findings
- Literature

Loosing blood

Multiple lesions

Possible enteritis???



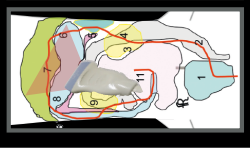
Bracco, Doberman, MI, 4 years

- Tested for Von Willebrand factor: positive
- Genetic screening: positive
- Treated for chronic enteritis

Bracco, MI, 4 years

Two months recheck

Probe position in a different patient



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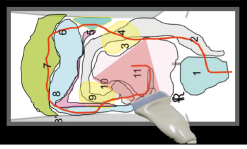
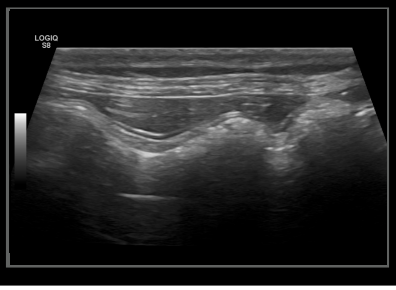
Bracco, MI, 4 years

Two months recheck

Probe position in a different patient



10-11



Bracco, Doberman, MI, 4 years

Conclusions

- Mild lymphocytic-plasmacytic enteritis
- Von Willebrand

Follow up

Still doing fine two years later but overweight

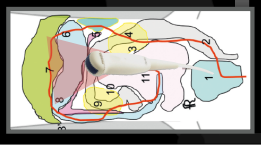
Poldo, Chihuahua, MI, 12 years

- PU/PD
- Pot belly
- Thin hair and alopecia

Poldo, MI, 12 years

Probe position in a different patient

7-6



Prevalence, location and concurrent diseases of ultrasonographic cyst-like lesions of abdominal lymph nodes in dogs

Veterinary Record (2017) doi: 10.1136/vr.103795

A. Liotta, F. Billen, M. Heimann, A. Hamaide, M. Rizza, A. L. Etienne, G. Bolen

Lymph nodal cyst-like lesions are occasionally identified during abdominal ultrasound in dogs. However, a study evaluating their prevalence and clinical significance is lacking. The aim of this observational cross-sectional study was to evaluate prevalence, most common location and concurrent diseases of cyst-like lymph nodes detected during abdominal ultrasound. Affected lymph nodes, patient signalment and concurrent diseases of dogs with

Histologically, in the present study, the lymph nodal cyst-like lesions detected by ultrasonography corresponded to sinusoid ectasia or haemorrhagic cavities.

(8/23), followed by neoplasia (7/23), gastroenteropathy (3/23), benign prostatic disease (2/23), pancreatitis (1/23), peritonitis (1/23) and neurological disease (1/23). No statistical correlation existed between cyst-like lymph nodal lesion and a specific neoplastic or non-neoplastic disease. In conclusion, in the present study, cyst-like lymph nodal lesions have a low prevalence, involve different lymphocenters and were found in dogs affected by different diseases, including both non-neoplastic and neoplastic aetiologies.

Poldo, Chihuahua, MI, 12 years

Conclusions

- Suspected hyperadrenocorticism
- Cystic LN - incidental finding

Active pituitary adenoma confirmed on blood works and CT

Conclusions

- The spleen may show breed related variations in normal anatomy
- Ultrasound is not histologically specific, particularly in lymphoid organs

Thank you

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