

Principi di refertazione e definizione delle linee guida tramite esercizi pratici



Diagnostic Mindset



Ma Spattini
LVM, PhD, DECVDI

Missy, Dogue de Bordeaux, FI, 2 years

- Yesterday, She ate normally
- This morning, She ate less
- Distended abdomen from the afternoon
- Under treatment for severe dermatitis



Missy, FI, 2 years

Blood works



RBC (milioni / μ L) :	4.62	5.70	8.56	Acantociti:	Eliptociti:
HGB (g/dL) :	11.2	14.1	21.2	Anisocitosi:	Ipocromia:
HCT (%) :	33.7	39.0	59.2	Agglutinazione:	Macroцити:
MCV (fL) :	72.8	63.1	72.6	Codociti:	Microцити:
MCH (pg) :	24.3	21.8	25.4	Cherociti:	Parassiti eritrocitari:
MCHC (g/dL) :	33.4	33.3	36.8	Crizociti:	Policromasia:
CHCM (g/dL) :		34.3	37.8	Corpi di Heinz:	Punteggiature basofile:
MCHC/CHCM:		0.94	1.01	Corpi di Howell-Jolly:	Rouleaux:
CH (pg) :		22.0	26.0	Cristalli di Hb:	Schistociti:
CHDW (pg) :		2.72	3.34	Dacriociti:	Selenociti:
RDW (%) :	14.2	11.6	14.7	Drepanociti:	Sferociti:
HDW (g/dL) :		1.63	2.22	Eccentricociti:	Stomatociti:
NRBC/100 WBC:	0	0	0	Echinociti:	Torociti:
Varie RBC:					
WBC (x 1000 / μ L) :	19.8	5.45	12.98	Linfociti attivati:	
Conta corr. WBC (x 1000 / μ L) :		5.45	12.98	Linfociti atipici:	
Mielociti (/ μ L) :	0	0	0	Neutrofilii tossici:	
Metamielociti (/ μ L) :	0	0	0	Corpi di Doehle:	
Neutrofilii banda (/ μ L) :	0	0	286	Schiumosità citopl.:	
Neutrofilii segmentati (/ μ L) :	17622	3555	9314	Vacuolizzazione citopl.:	
Linfociti (/ μ L) :	990	1169	3810	Basofilia citopl.:	
Monociti (/ μ L) :	1188	186	798	Granuli tossici:	
Eosinofili (/ μ L) :	340	104	1164	Neutrofilii giganti:	
Basofili (/ μ L) :	10	0	106	Macropoliciti:	
Danneggiate (/ μ L) :	0	0	0		
Indifferenziate (/ μ L) :	0	0	0		
Altre (/ μ L) :	0	0	0		
Varie WBC:					
PLT (1000 / μ L) :	403	176	479	Stima PLT:	ADEG: <input checked="" type="checkbox"/> INADEG: <input type="checkbox"/> AUMENT.: <input type="checkbox"/>
MPV (fL) :	6.8	8.9	15.0	Varie:	Piastrine attivate: <input type="checkbox"/> Macropiastriane: <input type="checkbox"/>
PCT (%) :	0.272	0.21	0.52		Piastrine allungate: <input type="checkbox"/> Inclusi piastrinici: <input type="checkbox"/>
PDW (%) :	9.5	51.8	74.5		

Missy, FI, 2 years

Blood works



CPK (IU/L):	155	42-155		
AST (IU/L):	45	20-50		
ALT (IU/L):	31	15-50		
ALP (IU/L):	55	20-110		
GGT (IU/L):	2.7	1-11		
Colinesterasi (IU/L):		3347-7074		
Bilirubina Totale (mg/dL):	0.30	0.15-0.4		
Proteine Totali (g/dL):	8.0	5.5-7.5		
Albumine (g/dL):	2.9	2.7-3.6		
Globuline (g/dL):	5.1	2.6-3.9		
Rapporto A/G:	0.57	0.7-1.2		
Colesterolo (mg/dL):	208	150-350		
Trigliceridi (mg/dL):	57	30-110		
AMILASI (IU/L):	659	300-1800		
Urea (mg/dL):	46	18-45		
Creatinina (mg/dL):	1.37	0.75-1.3		
Glucosio (mg/dL):	157	60-100		
Calcio (mg/dL):	8.6	8.2-12	Tempo di tromboplastina parziale attivata - aPTT (sec.):	12.8 15.2 22.9
Fosforo (mg/dL):	3.9	2.1-6.2	Tempo di protrombina - PT (sec.):	7.8 6.8 8.6
Magnesio (mg/dL):	0.67	0.67-0.94	Fibrinogeno (mg/dL):	194 152 284
Sodio (mEq/L):	147	143-151	Prodotti di degradazione della fibrina/fibrinogeno - FDPs (µg/mL):	0.82 < 5
Potassio (mEq/L):	4.1	3.9-5.1	D-Dimeri della fibrina (µg/mL):	0.42 0.01 0.34
Rapporto Na/K:	36	28.5-37.4	Antitrombina (%):	126 110 167
Cloro (mEq/L):	112	109-118		
Cloro corretto (mEq/L):	111	109.1-115.9		
HCO ₃ (mmol/L):		18.4-24.8		
Divario Anionico:		13.1-19.4		
Osmol. sier. calc. (mOsm):	290	277-291		
Ferro totale (µg/dL):	87	100-200		
UIBC (µg/dL):		182-306		
TIBC (µg/dL):		318-479		
Saturazione (%):		28.2-56.8		
Prot. C Reattiva (mg/dL):	1.17	0.01-0.22		
Lipasi (dggr) (U/L):		-		

Abdominal radiographs to check the stomach

Missy, FI, 2 years



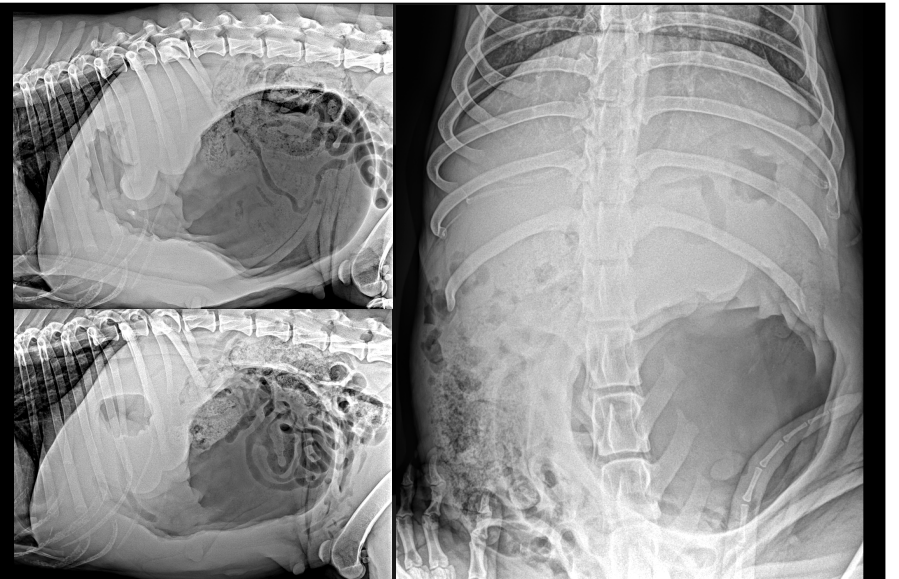
DX

Missy, FI, 2 years

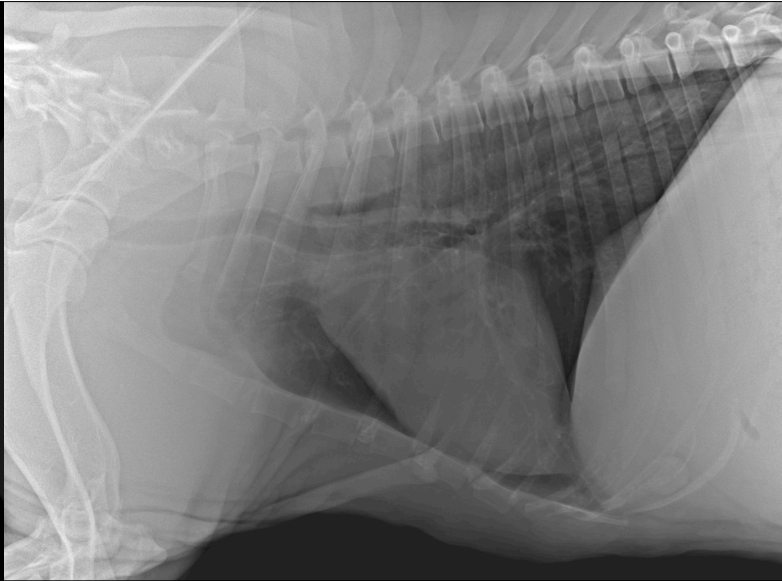


SX

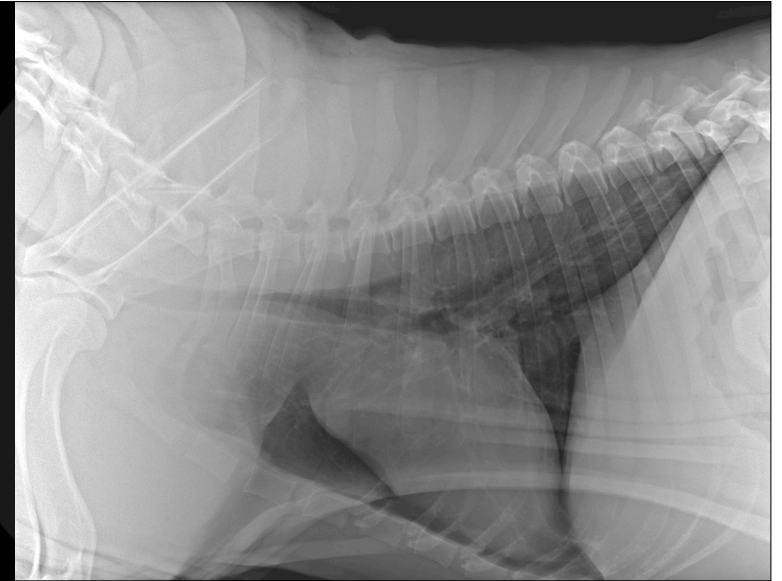
Missy, FI, 2 years



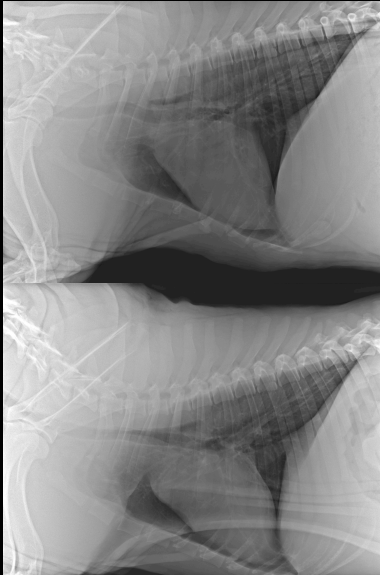
Missy, Fl, 2 years



Missy, Fl, 2 years



Missy, Fl, 2 years



Write your report

- 1) Description
 - Roentgen Numbers
- 2) Radiographic diagnosis
- 3) Differential diagnoses/conclusion



What is the meaning of "Report"

1982, Angelo Burlina,

definisce il concetto di referto in diagnostica clinica. "Refer-
to: è la relazione clinica, la risposta del medico. Il ter-
mine **deriva dal latino medioevale *referre*: riferire.**

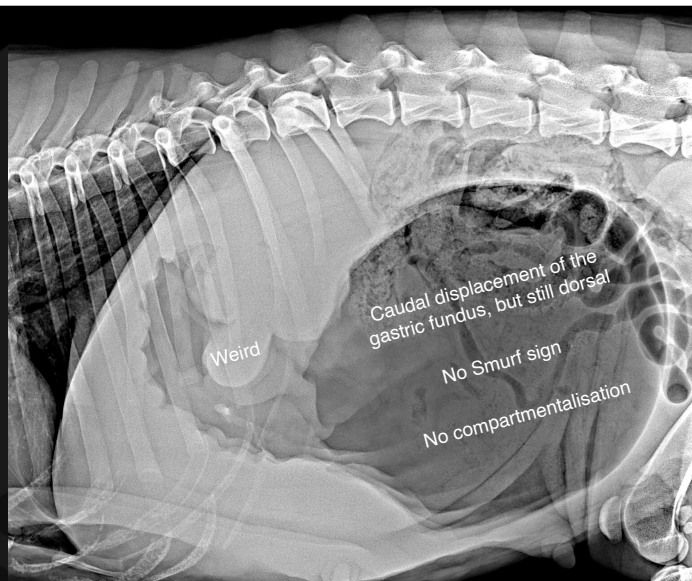
Il referto di qualsivoglia metodica strumentale è
l'atto scritto, ufficiale e definitivo con cui vengono co-
municati i risultati dell'esame.

**Scopo del referto è di affiancare e guidare il clinico
nello studio e nella definizione della patologia e nel
trattamento della malattia, sia in fase di diagnostica sia
di follow-up, attraverso criteri razionali e basati sulla
medicina delle evidenze. A tal fine questo "atto" medi-
co deve risultare corretto nella forma e nei contenuti
tecnici, e **fornire informazioni non ambigue, utili** sul
piano clinico e facilmente interpretabili.**

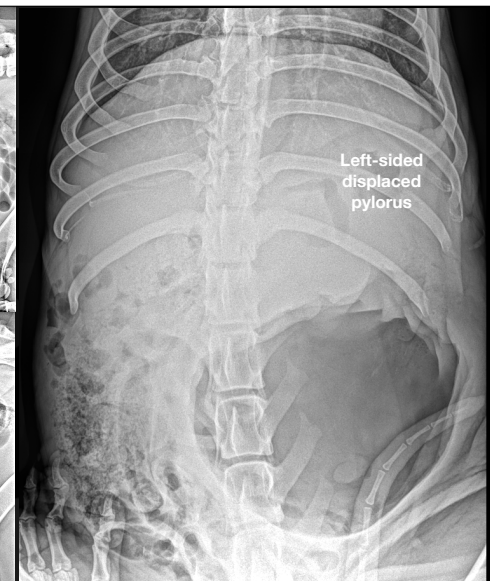
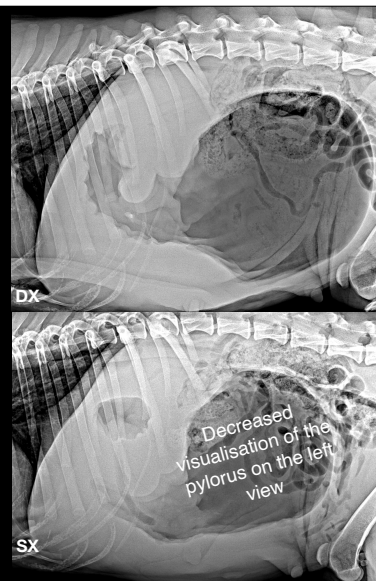
Missy, FI, 2 years



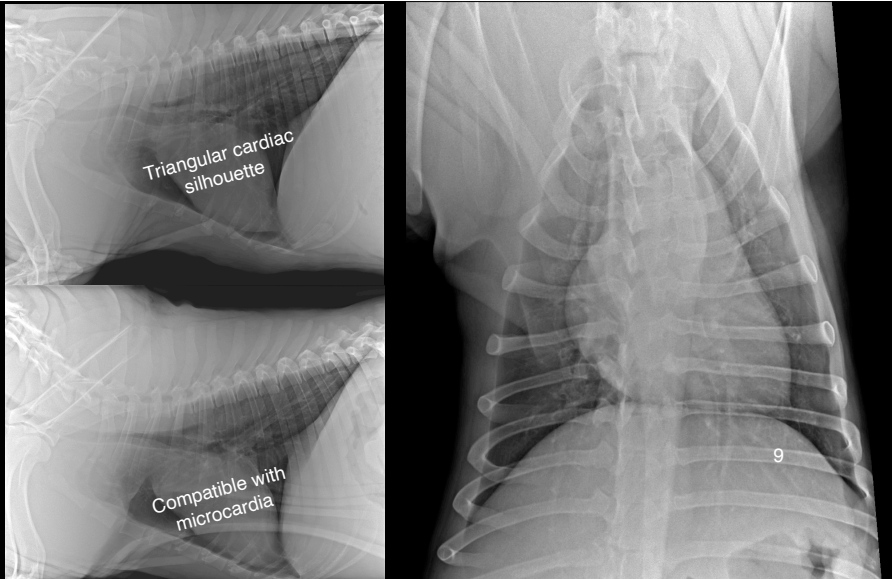
DX



Missy, FI, 2 years



Missy, FI, 2 years



Missy, Dogue de Bordeaux, FI, 2 years

Radiographic diagnoses:

- Left displacement pylorus, ... Spleen?
- Gastric dilatation, no GVD
- Microcardia

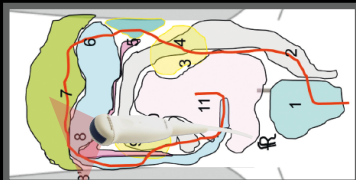


Next steps:

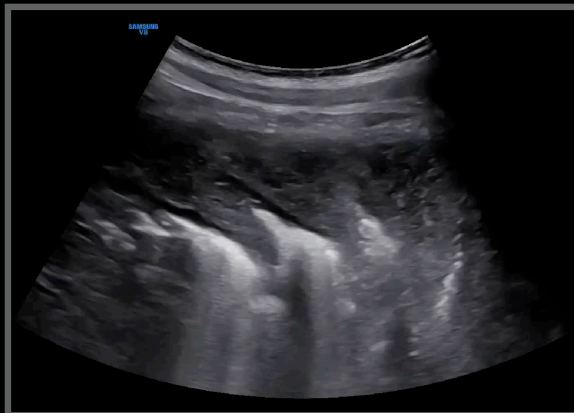
- A-Fast to check reasons for pyloric displacement

Missy, FI, 2 years

Probe position in a different patient



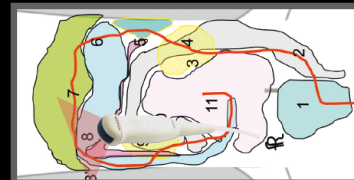
Pyloric region



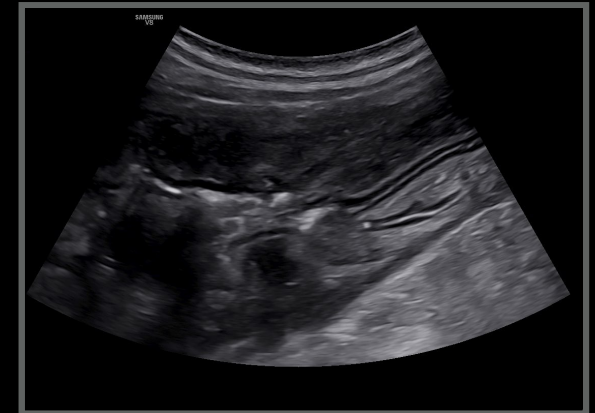
8

Missy, FI, 2 years

Probe position in a different patient



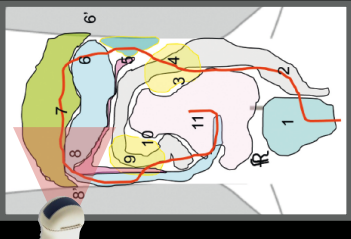
Pyloric region



8

Missy, FI, 2 years

Probe position in a different patient



Gall bladder

8'



Missy, Dogue de Bordeaux, FI, 2 years

Ultrasonographic diagnoses:

- Severe thickening of the submucosa
- Echoic sediment in the gallbladder

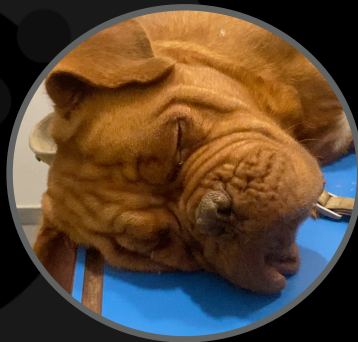
Conclusions:

- Suspected gastric oedema + functional gastric stasis
- Conservative management under hospitalisation and recheck



Missy, Dogue de Bordeaux, FI, 2 years

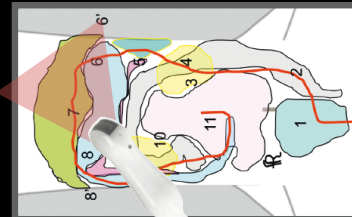
- Decompressed
- Responded well to medical treatment
- She seemed fine during the night but suddenly, She collapsed in the morning
- Recheck



Missy, FI, 2 years

12 hours later

Probe position in a different patient



7-6



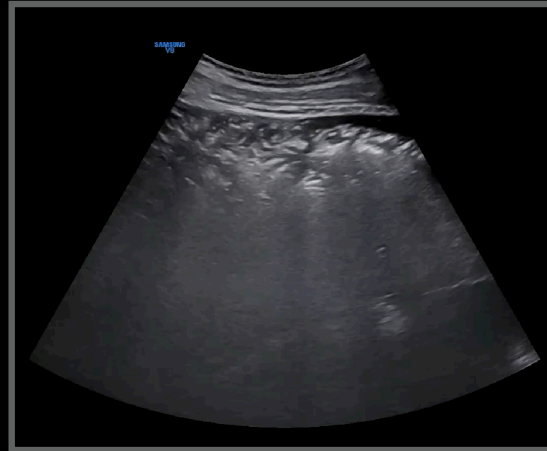
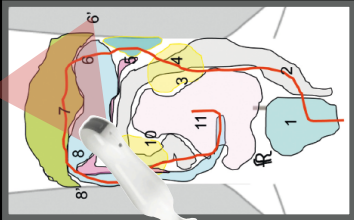
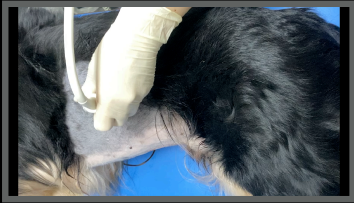
Missy, FI, 2 years

12 hours later

Probe position in a different patient

Left side of the liver

7-6

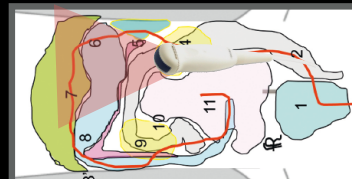


Missy, FI, 2 years

Probe position in a different patient

Gastric body

6-7

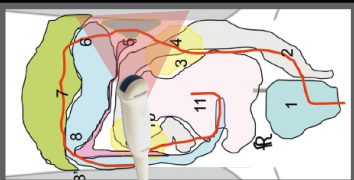


Missy, FI, 2 years

Probe position in a different patient

Splenic body

5



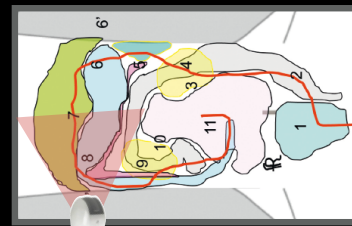
Missy, FI, 2 years

12 hours later

Probe position in a different patient

Right side of the liver

7-8



Missy, Dogue de Bordeaux, FI, 2 years

Ultrasonographic diagnoses:

- Gas in the intra-hepatic portal branches
- Gastric pneumatosis
- Splenic thrombosis
- Peritoneal effusion

Conclusions:

- Causes for gastric pneumatosis
- Confirm gas in the portal branches VS hepatic emphysema



Missy, FI, 2 years



Missy, FI, 2 years



Missy, FI, 2 years



Your evaluation

- Is there gas in the hepatic portal branches?
- Is there gas in the gastric wall?
- What would you do next?



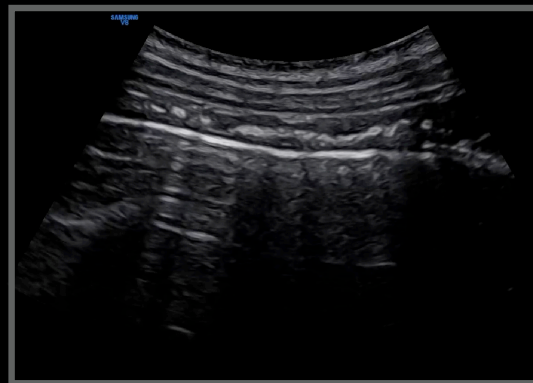
Gastric pneumatosis

The gastric wall is stretched

The $>$ Volume $<$ Pressure

The \downarrow P make liquid nitrogen precipitate in a gas state

Vacuum Phenomenon



Emerg Radiol
DOI 10.1007/s10140-016-1401-6



REVIEW ARTICLE

Vacuum phenomenon

Youichi Yanagawa¹ · Hiromichi Ohsaka¹ · Kei Jitsuiki¹ · Toshihiko Yoshizawa · Ikuto Takeuchi¹ · Kazuhiko Omori¹ · Yasumasa Oode¹ · Kouhei Ishikawa¹

the mechanism responsible for the formation of the VP [1]. If an enclosed tissue space is allowed to expand as a rebound phenomenon after an external impact, the volume within the enclosed space will increase. In the setting of expanding volume, the pressure within the space will decrease. The solubility of the gas in the enclosed space will decrease as the pressure of the space decreases. Decreased solubility allows a gas to leave a solution. The combination of lower nitrogen solubility and the minimal metabolism of nitrogen by the body mainly accounts for the formation of the VP. Basically, the mechanism underlying the formation of the VP is the same as cavitation induced by rotation of a ship's propeller in water, which depends on two laws of physics: Henry's Law and Boyle's Law.

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Missy, Dogue de Bordeaux, FI, 2 years

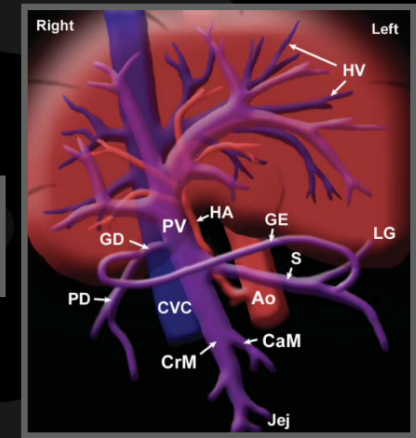
Differential diagnoses of gastric pneumatosis

- Gastric wall necrosis
- Gastric mucosal disruption
- Emphysematous gastritis
- Increased mucosal permeability

Canine and feline **emphysematous gastritis** may be differentiated from gastric emphysema based on clinical and imaging characteristics: Five cases.
Thierry F, Ferreira MF, Paterson GK, Liuti T, Del-Pozo J.
Vet Radiol Ultrasound. 2019 Mar;60(2):136-144. doi: 10.1111/vru.12691. Epub 2018 Oct 11.
PMID: 30311329

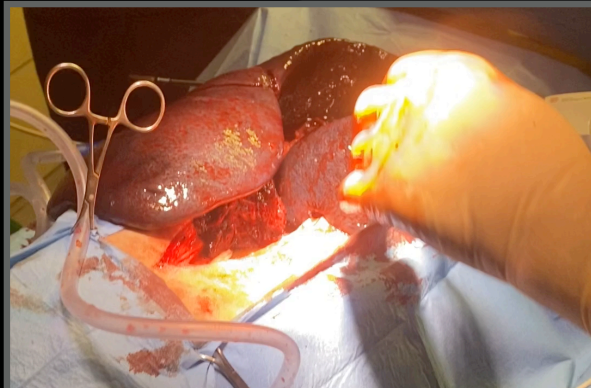
Missy, Dogue de Bordeaux, FI, 2 years

Ultrasonographic differentiation between **portal venous** and **parenchymal gas** may be important for the prognosis of canine and feline hepatic emphysema: 37 cases.
Manfredi S, Fabbi M, Bonazzi M, Leonardi F, Miduri F, Parrocchini I, Daga E, Gnudi G, Volta A.
Vet Radiol Ultrasound. 2019 Nov;60(6):734-744. doi: 10.1111/vru.12797. Epub 2019 Aug 16.
PMID: 31418983



Portal venous system. Atlas of Small Animal Ultrasonography 2nd ed., D. Penninck, M.A. d'Anjou. 2015 Wiley.

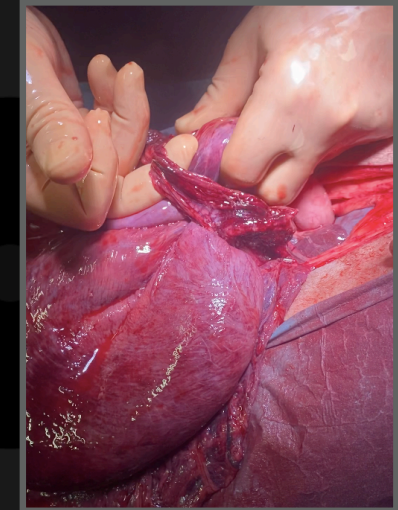
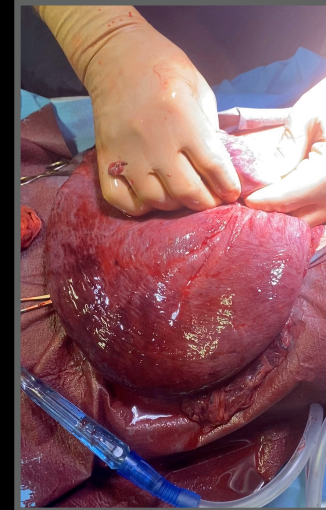
Missy, FI, 2 years



Primary splenic torsion in dogs: 102 cases (1992-2014).
DeGroot W, Giuffrida MA, Rubin J, Runge JJ, Zide A, Mayhew PD, Culp WT, Mankin KT, Amsellem PM, Petrukovich B, Ringwood PB, Case JB, Singh A.
J Am Vet Med Assoc. 2016 Mar 15;248(6):661-8. doi: 10.2460/javma.248.6.661.
PMID: 26953920 [Free article.](#)

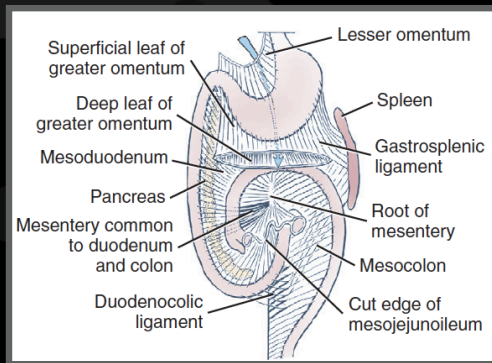


Missy, FI, 2 years



Missy, Dogue de Bordeaux, FI, 2 years

- Splenic torsion
- Rupture of the gastrosplenic ligament
- Pyloric entrapment



*Plan of visceral and connecting peritoneum, ventral aspect.
Miller's Anatomy of the Dog, 4rd ed., H. Evans, A. de Lahunta.
2013 WB Saunders.*

Missy, Dogue de Bordeaux, FI, 2 years

Conclusions:

- Splenectomy and omental repair
- She recovered after surgery



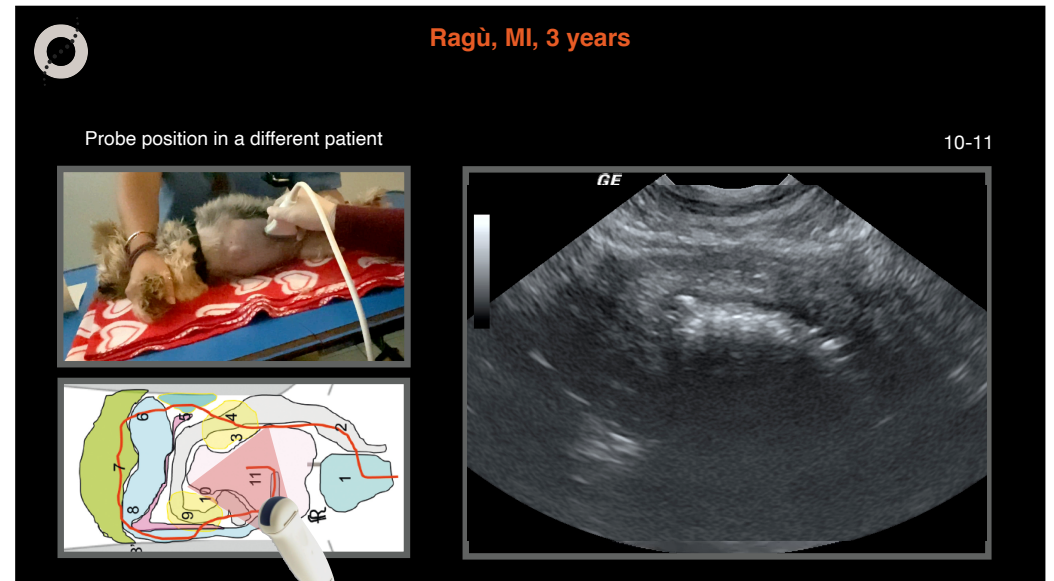
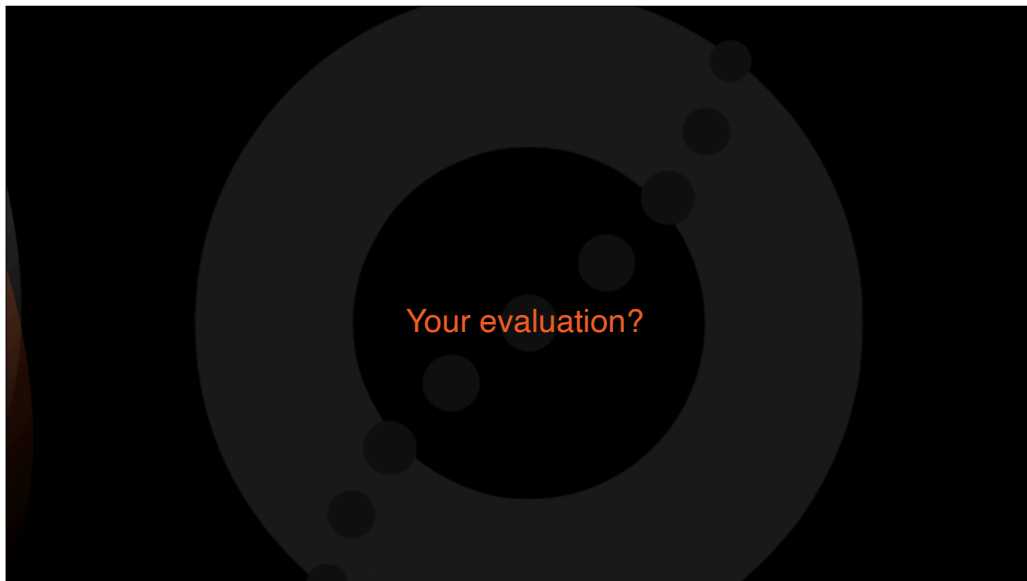
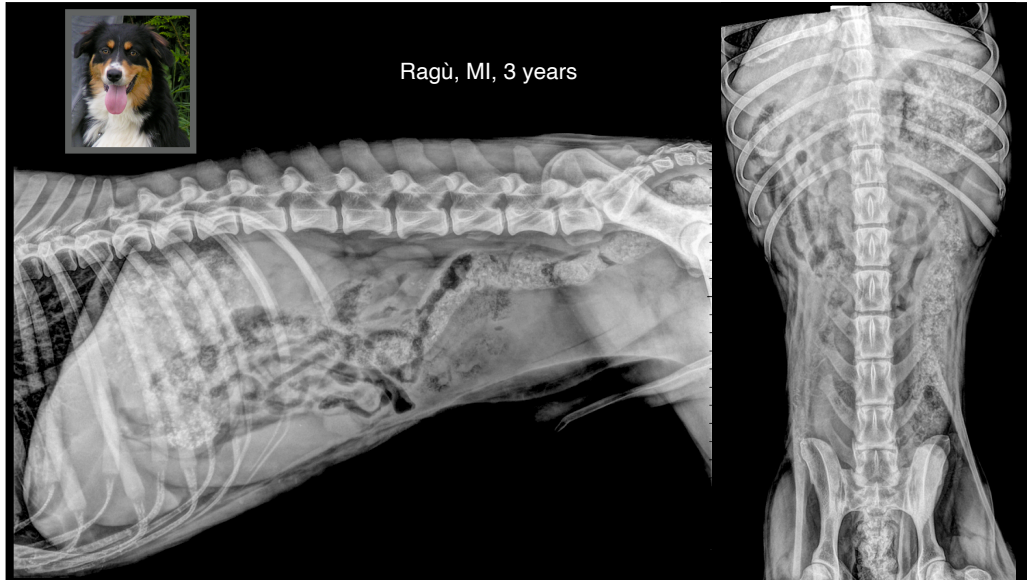
Ragù, Australian Shepherd, MI, 3 years

- Yesterday he was fine
- This morning anorexic, lethargic, caudal abdominal pain
- He sleeps outside
- A mass is palpated by the referring vet



Ragù, MI, 3 years





Ragù, MI, 3 years

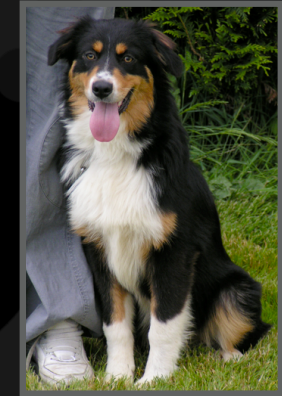


Ragù, Australian Shepherd, MI, 3 years

Radiographic and Ultrasonographic diagnoses:

- Focal loss of abdominal detail
- Possible FB

Conclusions?

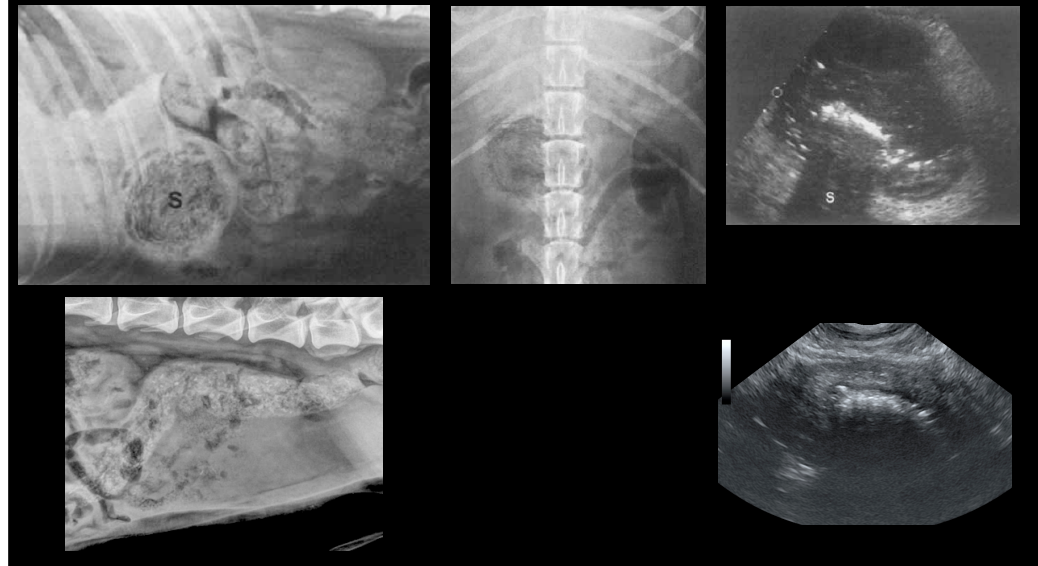


RADIOGRAPHIC AND ULTRASONOGRAPHIC FEATURES OF RETAINED SURGICAL SPONGE IN EIGHT DOGS

MONICA MERLO, DVM, CHRISTOPHER R. LAMB, MA, VETMB

The radiographic and ultrasonographic signs in eight dogs with a surgical or pathologic diagnosis of retained surgical sponge were reviewed. The most frequent previous surgery was ovariohysterectomy, either as an elective procedure or to treat pyometra. The median elapsed time between surgery and diagnosis of retained surgical sponge was 9.5 months (range 4 days to 38 months). Five dogs had a draining sinus; four had a palpable abdominal mass. Radiologic signs included localized, speckled or whirl-like gas lucency, abdominal mass, and non-focal soft tissue swelling. Survey radiography and sinography were considered diagnostic for retained surgical sponge in 4/7 (57%) and 3/5 (60%) dogs, respectively. The combined use of survey radiography and sinography enabled detection of 6/7 (86%) sponges. In each dog that had ultrasonography, a hypoechoic mass was found that had an irregular hyperechoic centre. The possibility of retained surgical sponge should be considered in animals with a history of previous surgery and a sinus or abdominal mass. *Veterinary Radiology & Ultrasound*, Vol. 41, No. 3, 2000, pp 279-283.

Key words: foreign body, surgery, complications, abdomen, dog.



Ragù, Australian Shepherd, MI, 3 years

Conclusion:

- Focal peritonitis surrounding a retained sponge
- Surgery for inguinal hernia six months ago

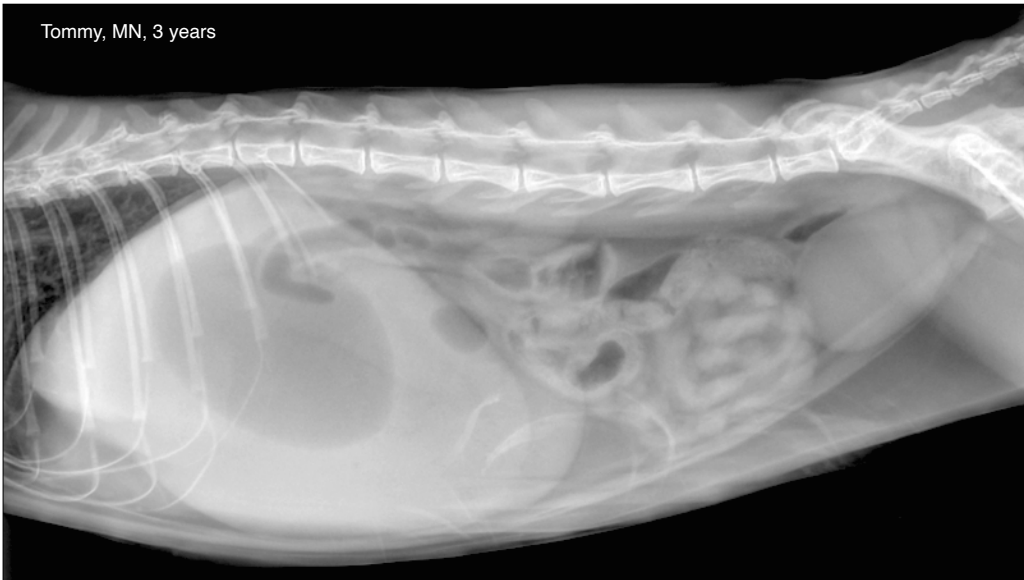


Tommy, DSH, MN, 3 years

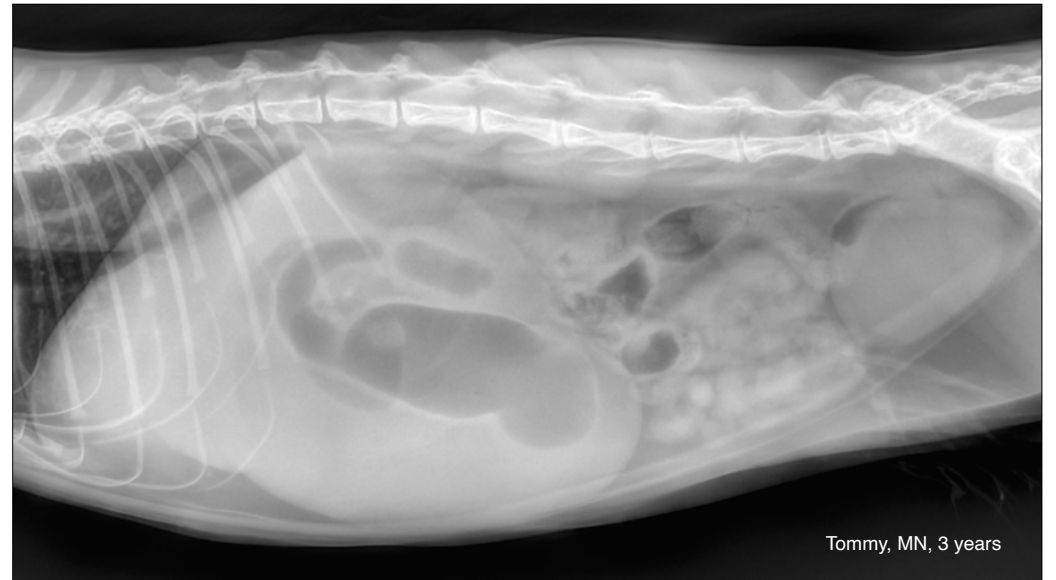
- Not drinking
- Not eating
- Vomiting
- Dehydrated



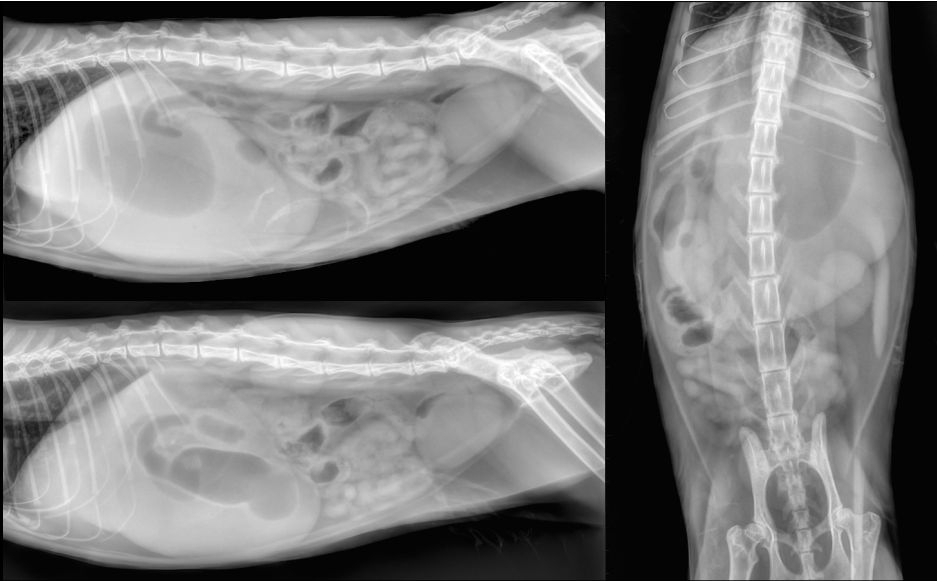
Tommy, MN, 3 years



Tommy, MN, 3 years



Tommy, MN, 3 years



Your evaluation

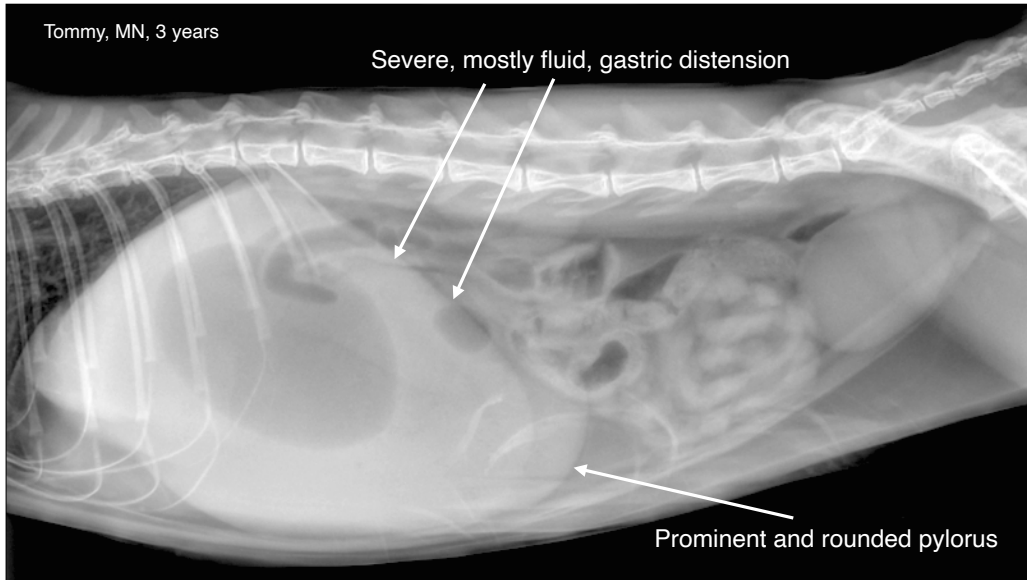
- Is there a foreign body?
- Is there gastroenteritis?
- Is there a gastric occlusion?



Tommy, MN, 3 years

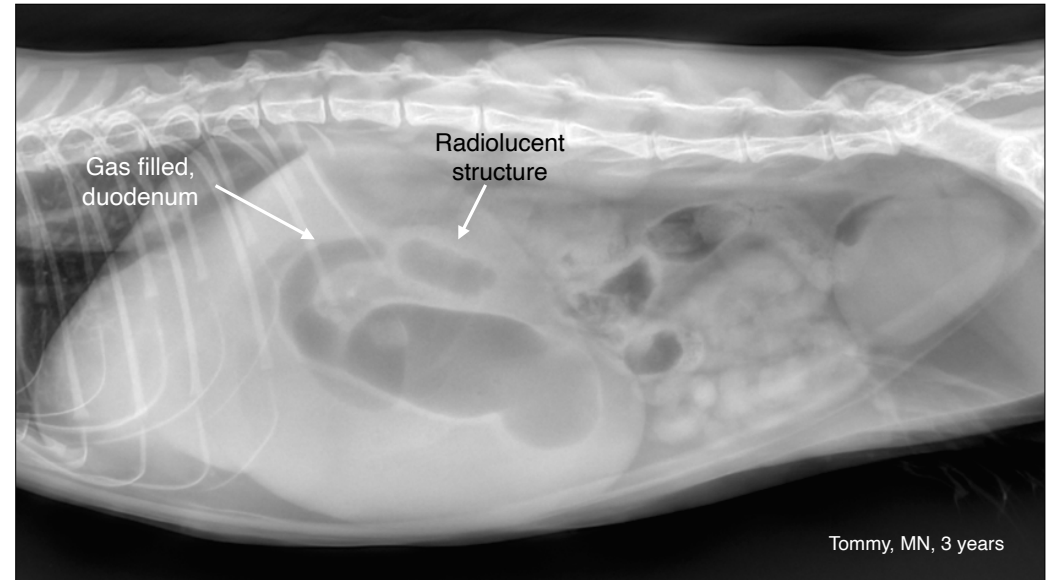
Severe, mostly fluid, gastric distension

Prominent and rounded pylorus



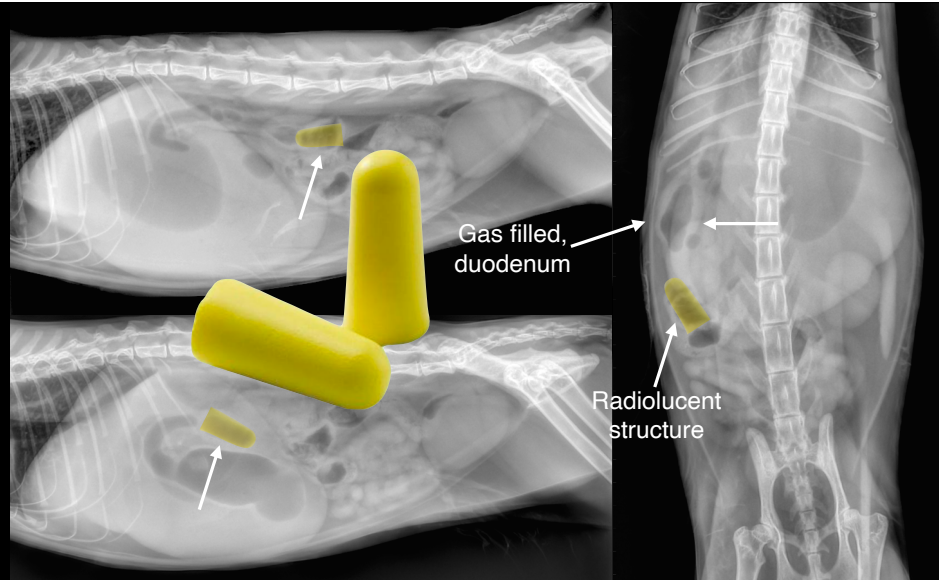
Gas filled, duodenum

Radiolucent structure



Tommy, MN, 3 years

Tommy, MN, 3 years



Key points

- If there is gas in the duodenum, always question why!
- Foreign bodies can be radiolucent
- An over-distended by fluid stomach is usually associated with a pyloric or duodenal occlusion



Thank you



Diagnostic Mindset

www.diagnosticmindset.com