

# TROMBOEMBOLISMO ARTERIAL FELINO



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# Cual es la prevalencia de TEA en gatos?

- 4 %
- 11 %
- 42 %
- 50 %

# Cual / cuales mecanismos están implicados en la fisiopatología del TEA

- Estasis sanguíneo
- Hipercoagulabilidad
- Lesión endotelial

Que % de gatos han sido diagnosticados con cardiopatía antes del evento trombótico

- 5 %
- 10 %
- 40 %
- 70 %

Por cuanto tiempo el gato puede presentar dolor luego de evento trombótico?

- 6 -12 hs
- 24 – 48 hs
- 4 – 5 días
- 7 días

Cual es el tiempo máximo para que la reperfusión sea efectiva?

- 6 - 12 hs
- 12 - 24 hs
- 48 – 72 hs
- 5 días

La terapia trombolítica es mas efectiva que los anticoagulantes

- V

- F

# Survival in cats with primary and secondary cardiomyopathies

Ilaria Spalla<sup>1</sup>, Chiara Locatelli<sup>1</sup>, Giulia Riscuzzi<sup>1</sup>,  
Sara Santagostino<sup>2</sup>, Elena Cremaschi<sup>1</sup> and Paola Brambilla<sup>1</sup>

**Table 2** Clinical signs at presentation

| Reason for presentation                       | Overall population | HCM      | RCM       | Secondary CM |
|-----------------------------------------------|--------------------|----------|-----------|--------------|
| Dyspnoea/CHF                                  | 38                 | 19       | 12        | 7            |
| Arterial thromboembolism                      | 8                  | 5        | 2         | 1            |
| Syncope                                       | 7                  | 5        | 0         | 2            |
| Other (arrhythmias with no syncopal episodes) | 4                  | 1        | 0         | 3            |
| Total                                         | 57 (61%)           | 30 (60%) | 14 (100%) | 13 (43%)     |

# THE FELINE CARDIOMYOPATHIES

## 1. General concepts



Only around **10%** of cats with ATE have had a previous diagnosis of heart disease, meaning the onset of signs of ATE is usually unexpected.

# Triada de Virchow

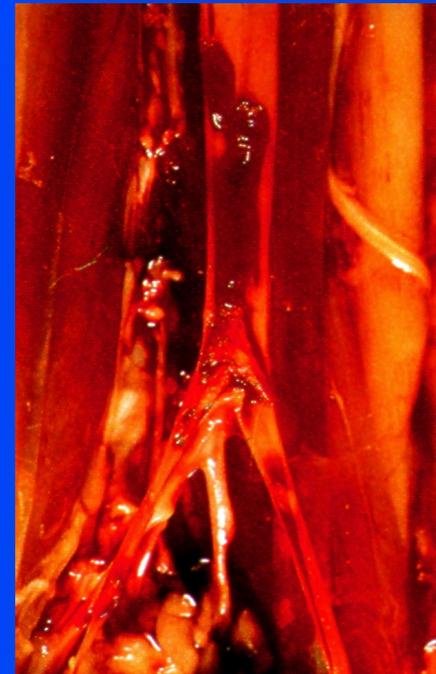
**CORAZÓN IZQUIERDO O CIRCULACIÓN SISTÉMICA**

(HCM – RCM – DCM - NCM)

- Lesión endotelial
- Estasis circulatorio.
- Incremento de la coagulabilidad

**90 % aorta terminal gatos con enfermedad cardiaca**

Rudolf Virchow



# ARTERIAL THROMBOEMBOLISM

## Risks, realities and a rational first-line approach

Virginia Luis Fuentes



It is generally accepted that platelet activation, blood stasis and endothelial dysfunction all contribute to ATE in cats.



*J Vet Intern Med* 2006;20:120–130

## **Assessment of Left Atrial Appendage Flow Velocity and its Relation to Spontaneous Echocardiographic Contrast in 89 Cats with Myocardial Disease**

Karsten E. Schober and Imke Maerz

*J Vet Intern Med* 2008;22:546–552

## **Hypercoagulability in Cats with Cardiomyopathy**

T. Stokol, M. Brooks, J.E. Rush, M. Rishniw, H. Erb, E. Rozanski, M.S. Kraus, and A.L. Gelzer

*J Vet Intern Med* 2014;28:411–418

## **Platelet Activation in Cats with Hypertrophic Cardiomyopathy**

F. Tablin, T. Schumacher, M. Pombo, C.T. Marion, K. Huang, J.W. Norris, K.E. Jandrey, and M.D. Kittleson



REVIEW

# Cardiogenic embolism in the cat



Daniel F. Hogan, DVM <sup>a,\*</sup>, Benjamin M. Brainard, VMD <sup>b</sup>

- ATE cardiogénico ocurre en el 5 %– 17 % de gatos con enfermedad cardiaca, con sobreexpresión en machos.
- Algunas razas presentan un riesgo incrementado : Ragdoll , Abisinio
- Payle et al. 9% de gatos con MCH mueren de ATE en 2 años

**Prevalencia 11, 3 %**

# TROMBOEMBOLISMO AORTICO

A close-up photograph of a surgical dissection of the aorta. The vessel is cut open, revealing a large, pale, gelatinous thrombus (blood clot) that has formed within the lumen. The surrounding tissue is pinkish-red, and surgical instruments are visible, indicating an ongoing procedure.

## TIPOS DE EMBOLISMO:

### TROMBOS

SÉPTICOS ( ENDOCARDITIS )

TUMORES

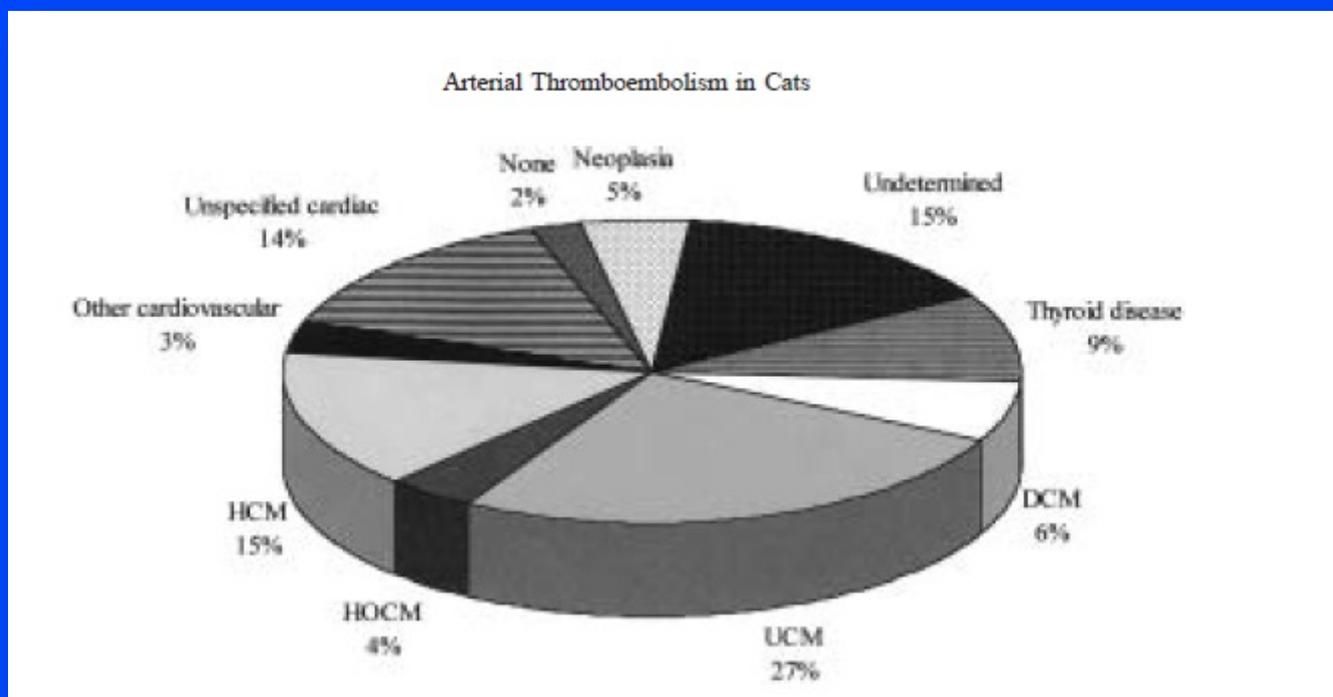
GRASA

AIRE ( IATROGENICOS )

CUERPO EXTRAÑOS ( CATETERES )

## Arterial Thromboembolism in Cats: Acute Crisis in 127 Cases (1992–2001) and Long-Term Management with Low-Dose Aspirin in 24 Cases

Stephanie A. Smith, Anthony H. Tobias, Kristin A. Jacob, Deborah M. Fine, and Pamela L. Grumbles





CAUSAS

# ACVIM consensus statement guidelines for the classification, diagnosis, and management of cardiomyopathies in cats

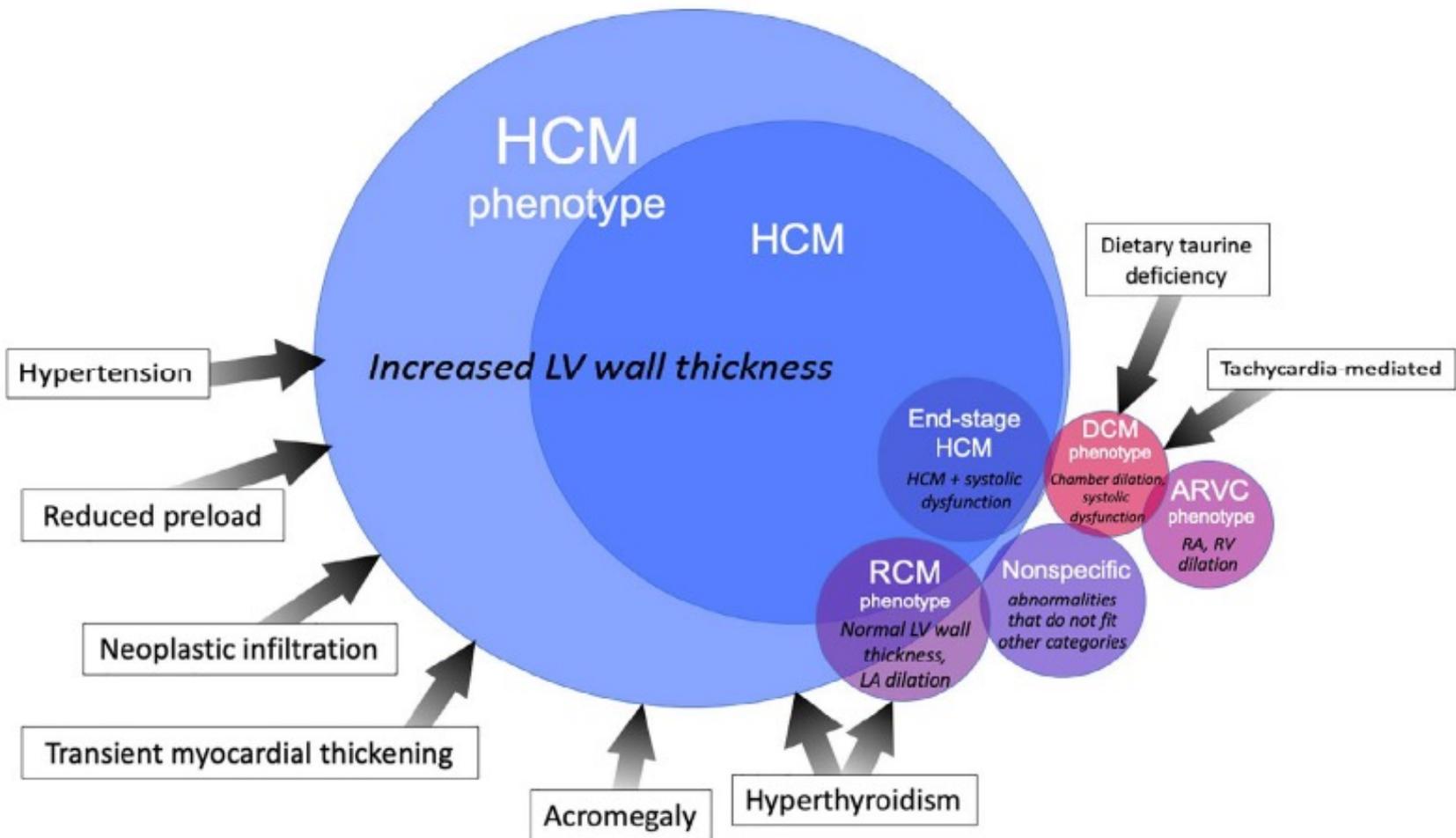
J Vet Intern Med. 2020;1–16.

## European Society of Cardiology (ESC)

| Phenotype                                                                                                                    | Definition                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hypertrophic cardiomyopathy (HCM)                                                                                            | Diffuse or regional increased LV wall thickness with a nondilated LV chamber.                                                                                                                                                                                     |
| Restrictive cardiomyopathy (RCM)                                                                                             |                                                                                                                                                                                                                                                                   |
| Endomyocardial form                                                                                                          | Characterized macroscopically by prominent endocardial scar that usually bridges the interventricular septum and LV free wall, and may cause fixed, mid-LV obstruction and often apical LV thinning or aneurysm; LA or biatrial enlargement is generally present. |
| Myocardial form                                                                                                              | Normal LV dimensions (including wall thickness) with LA or biatrial enlargement                                                                                                                                                                                   |
| Dilated cardiomyopathy (DCM)                                                                                                 | LV systolic dysfunction characterized by progressive increase in ventricular dimensions, normal or reduced LV wall thickness, and atrial dilatation.                                                                                                              |
| Arrhythmogenic cardiomyopathy (AC), also known as arrhythmogenic right ventricular cardiomyopathy (ARVC) or dysplasia (ARVD) | Severe RA and RV dilatation and often, RV systolic dysfunction and RV wall thinning. The left heart may also be affected. Arrhythmias and right-sided congestive heart failure are common.                                                                        |
| Nonspecific phenotype                                                                                                        | A cardiomyopathic phenotype that is not adequately described by the other categories; the cardiac morphology and function should be described in detail                                                                                                           |

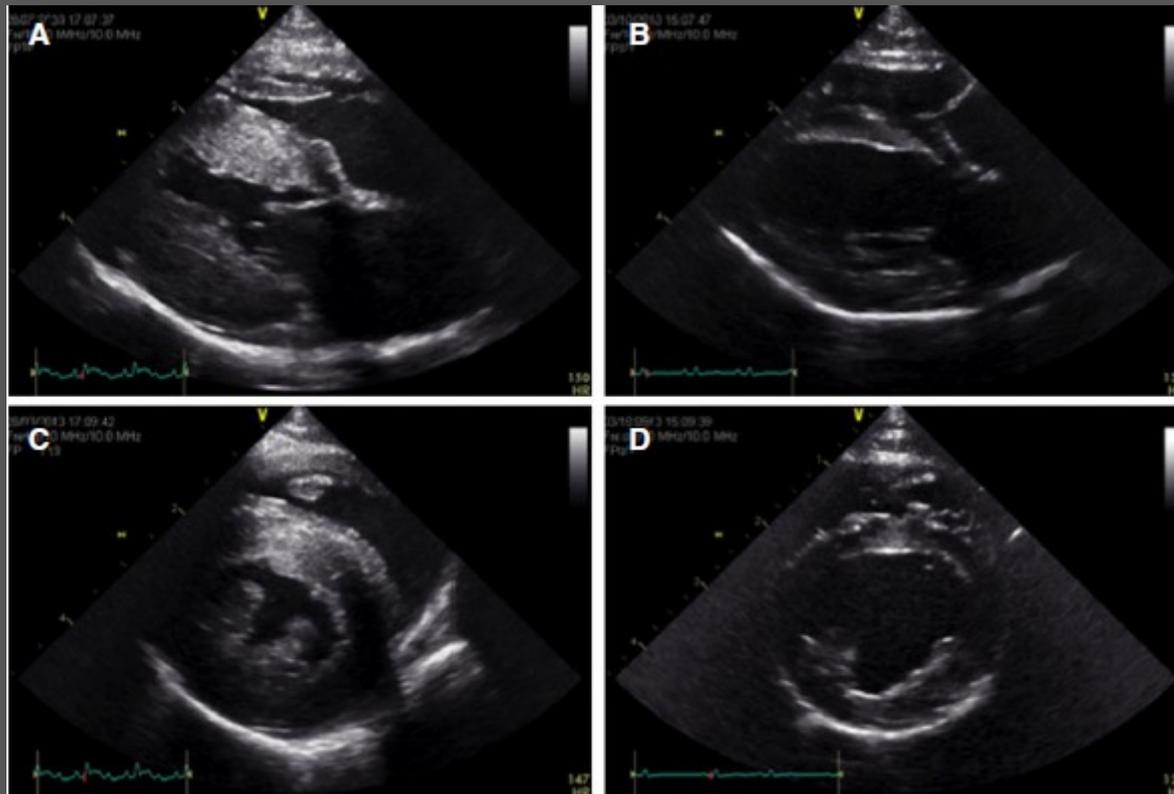
# ACVIM consensus statement guidelines for the classification, diagnosis, and management of cardiomyopathies in cats

J Vet Intern Med. 2020;1-16.



# Transient Myocardial Thickening in Cats Associated with Heart Failure

J. Novo Matos , N. Pereira, T. Glaus, L. Wilkie, K. Borgeat, J. Loureiro, J. Silva, V. Law, A. Kranjc, D.J. Connolly, and V. Luis Fuentes



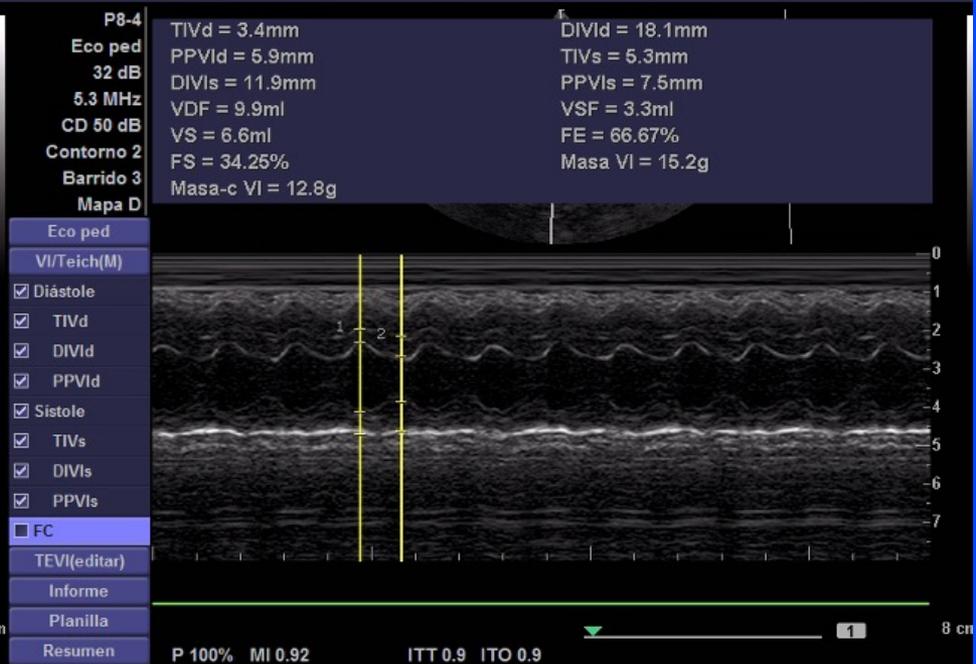
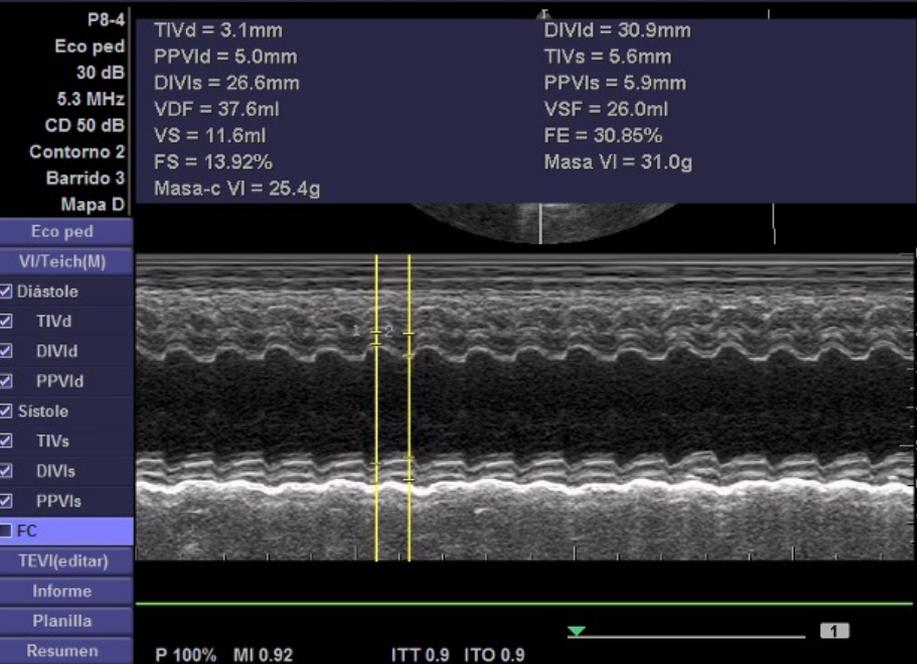
# DÉFICIT DE TAURINA

- Aminoácido esencial para los gatos
- Rara en felinos que consumen alimento balanceado  
dietas secas: 1000-2000 mg/kg (de peso seco)  
enlatados: 2000-2500 mg/kg (de peso seco)

Niveles plasmáticos normales: sangre >250 nmol/ml

**Deficiencia de Taurina** : plasma < 50 nmol/ml

sangre entera < 250 nmol/ml



|                   | 1 día | 16 dias | 2 meses | 6 meses |
|-------------------|-------|---------|---------|---------|
| <b>DDVI</b>       | 26mm  | 21mm    | 18mm    | 16mm    |
| <b>DSVI</b>       | 22mm  | 15mm    | 10mm    | 8mm     |
| <b>FA</b>         | 15%   | 28%     | 44%     | 50%     |
| <b>Ao</b>         | 8mm   | 8mm     | 9mm     | 9mm     |
| <b>AI</b>         | 22mm  | 15mm    | 14mm    | 13mm    |
| <b>Ef Pleural</b> | +     | -       | -       | -       |



# SIGNOS CLÍNICOS

# SINTOMATOLOGÍA

- Lugar.
- Grado de obstrucción (parcial o total).
- Circulación colateral.



90% embolización aortica distal

# Las "5 P"

## Recognition of ATE

### History

- ✦ Sudden-onset vocalising
- ✦ Dragging of one or more limbs

### Physical examination

- ✦ Lower motor neuron signs in one or more limbs
- ✦ Absent femoral pulses
- ✦ Cold distal limbs
- ✦ Pale or blue pads
- ✦ Cranial tibial/gastrocnemius may be firm

### The '5 Ps'

Pain

Paralysis

Pulselessness

Poikilothermy

Pallor

# SINTOMAS

- ❖ **Vocalizaciones**
- ❖ **Paresia/ parálisis de miembros posteriores**
- ❖ **Músculos tibiales anteriores y gastrocnemios duros y dolorosos**
- ❖ **Miembros fríos y sin pulso. Cianosis**
- ❖ **C/S Signos de I.C.C.**



## Concurrent Diseases and Conditions in Cats with Renal Infarcts

M.C. Hickey, K. Jandrey, K.S. Farrell, and D. Carlson-Bremer

**Background:** Renal infarcts identified without definitive association with any specific disease process.

**Objective:** Determine diseases associated with diagnosis of renal infarcts in cats diagnosed by sonography or necropsy.

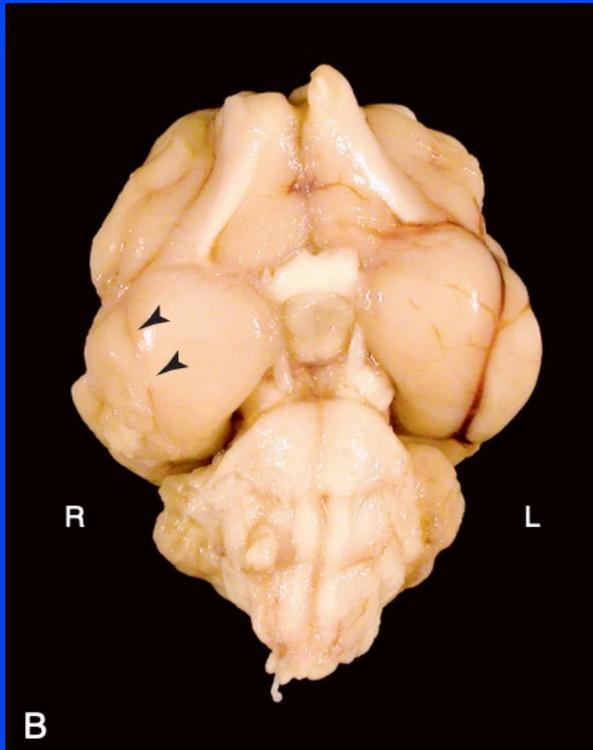
**Animals:** 600 cats underwent abdominal ultrasonography, necropsy, or both at a veterinary medical teaching hospital.

**Methods:** Information obtained from electronic medical records. Cats classified as having renal infarct present based on results of sonographic evaluation or necropsy. Time-matched case-controls selected from cats that underwent the next scheduled diagnostic procedure.

**Results:** 309 of 600 cats having diagnosis of renal infarct and 291 time-matched controls. Cats 7–14 years old were 1.6 times (odds ratio, 95% CI: 1.03–2.05,  $P = .03$ ) more likely to have renal infarct than younger cats but no more likely to have renal infarct than older cats (1.4, 0.89–2.25,  $P = .14$ ). All  $P = .14$  are statistically significant. Cats with renal infarcts were 4.5 times (odds ratio, 95% CI: 2.63–7.68,  $P < .001$ ) more likely to have HCM compared to cats without renal infarcts. Cats with renal infarcts were 0.7 times (odds ratio, 95% CI: 0.51–0.99,  $P = .046$ ) less likely to have diagnosis of neoplasia compared to cats without renal infarcts. Cats with diagnosis of hyperthyroidism did not have significant association with having renal infarct. Cats with renal infarcts were 8 times (odds ratio, 95% CI: 2.55–25.40,  $P < .001$ ) more likely to have diagnosis of distal aortic thromboembolism than cats without renal infarcts.

**Conclusions and Clinical Importance:** Cats with renal infarcts identified on antemortem examination should be screened for occult cardiomyopathy.

**Key words:** Abdominal ultrasonography; Cardiomyopathy; Cardiovascular; Kidney; Radiology and diagnostic imaging; Thromboembolism.



Treatment and Prevention of Feline Arterial  
Thromboembolism Daniel F. Hogan

## Arterial Thromboembolism in 250 Cats in General Practice: 2004–2012

K. Borgeat, J. Wright, O. Garrod, J.R. Payne, and V.L. Fuentes

Cats with  
a rectal  
temperature  
<37°C are less  
likely to be  
survivors.



- ✓ 77,6 % afecta ambos MPs.
- ✓ 44,8 % presentaban disnea al ingreso.
- ✓ 68,2 % presentaban anomalías a la auscultación cardíaca.
- ✓ A menor temperatura rectal al ingreso mayor mortalidad.
- ✓ Sobrevida al año fue del 20 %.
- ✓ No haber recibido aspirina, clopidogrel o ambos fue un predictor de mortalidad antes de los 7 días.



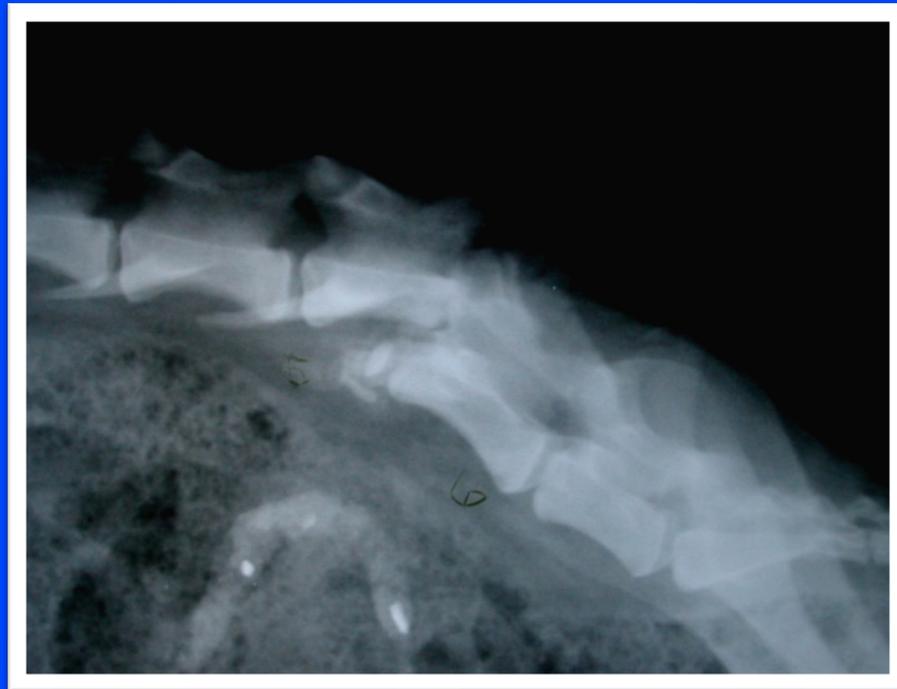
As many as 70–80% of cats with a single limb affected will survive to discharge, with up to 90% survival rates in cats presenting with some motor function.



DIAGNÓSTICO

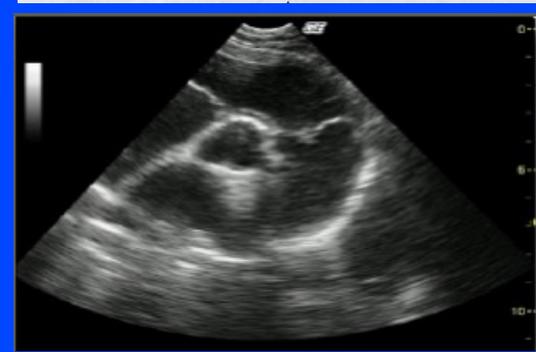
# DIAGNOSTICO DIFERENCIAL

- **TRAUMA ESPINAL**
- **Linfosarcoma espinal u otras neoplasias**
- **Infarto fibrocartilaginoso**
- **Hernia discal**



# DIAGNÓSTICO

- ❖ **SIGNOS CLÍNICOS**
- ❖ **ECOCARDIOGRAMA**
- ❖ **Electrocardiograma**
- ❖ **Ecodoppler aórtico**
- ❖ **Doppler de flujo**
- ❖ **Angiografía**



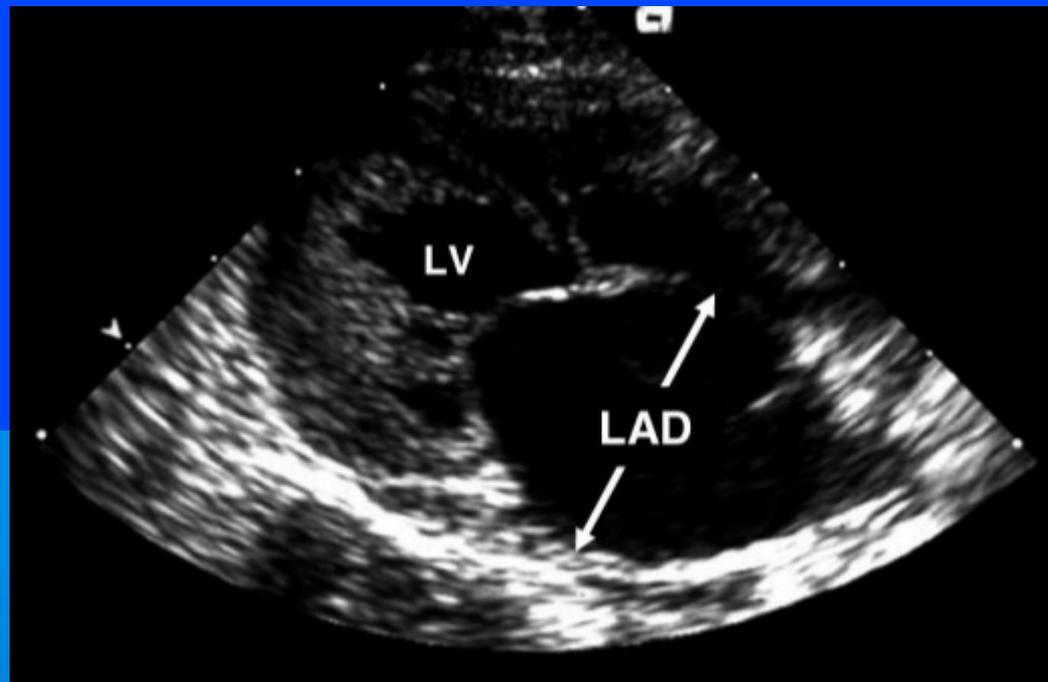
# ECOCARDIOGRAMA

- ❖ Diagnóstico de enfermedad cardíaca
- ❖ Pueden verse trombos intracardíacos



# Diagnostic Accuracy of Electrocardiography and Thoracic Radiography in the Assessment of Left Atrial Size in Cats: Comparison with Transthoracic 2-Dimensional Echocardiography

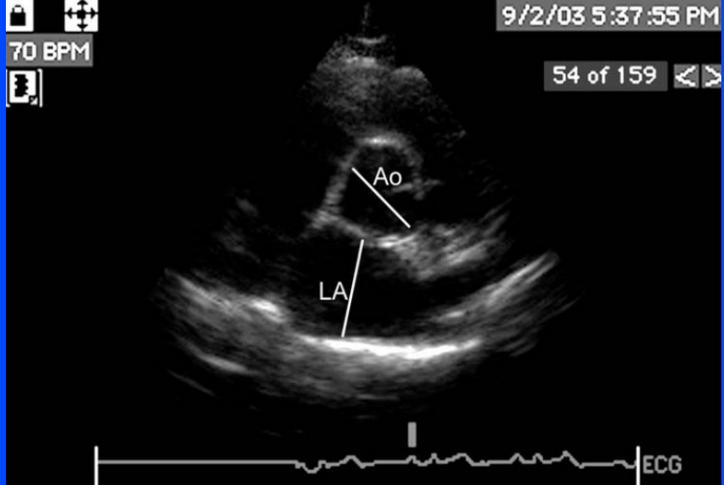
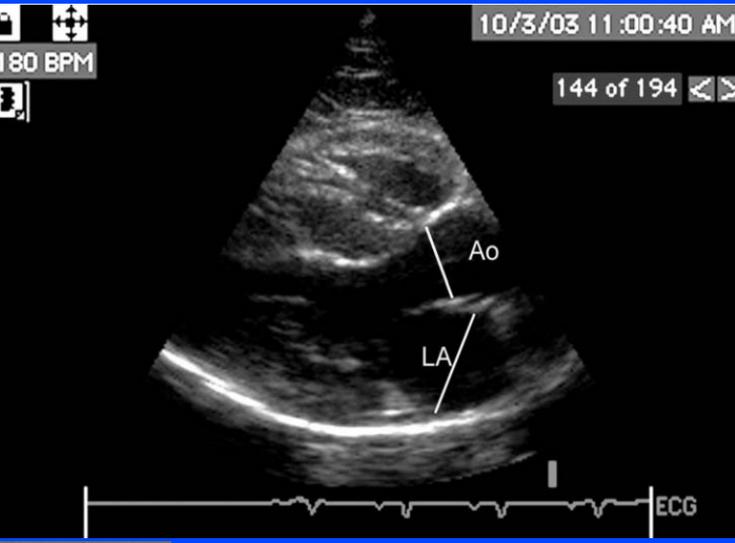
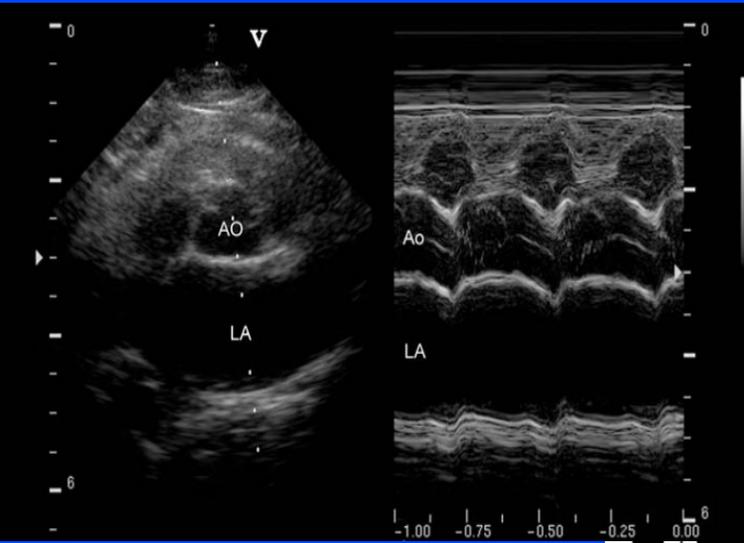
Karsten E. Schober, Imke Maerz, Eberhard Ludewig, and Joshua A. Stern



**Conclusion and Clinical Importance:** ECG and thoracic radiography are reasonably specific but less sensitive predictors of LAE in cats.

# Two-Dimensional Echocardiographic Assessment of the Feline Left Atrium

Jonathan A. Abbott and Heidi N. MacLean



# ECODOPPLER AÓRTICO

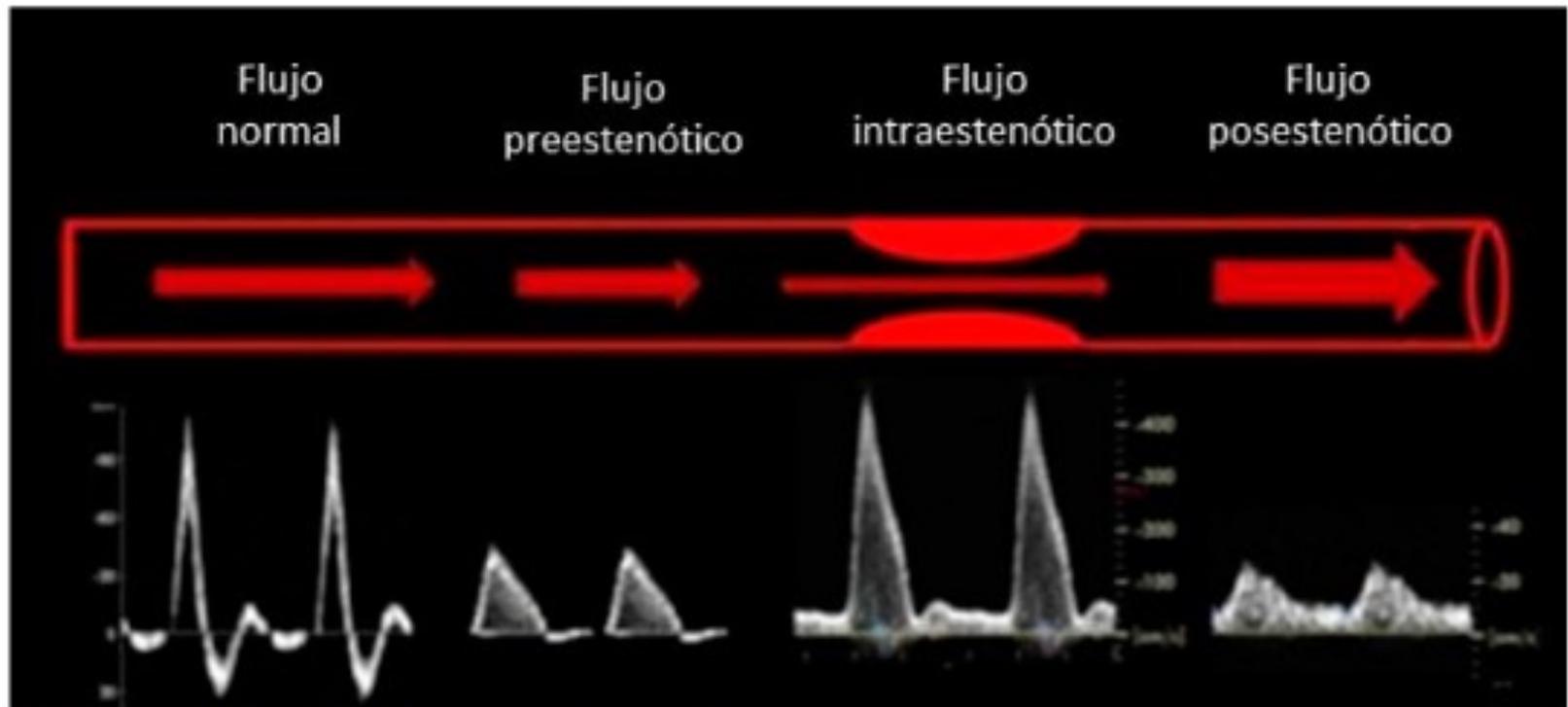
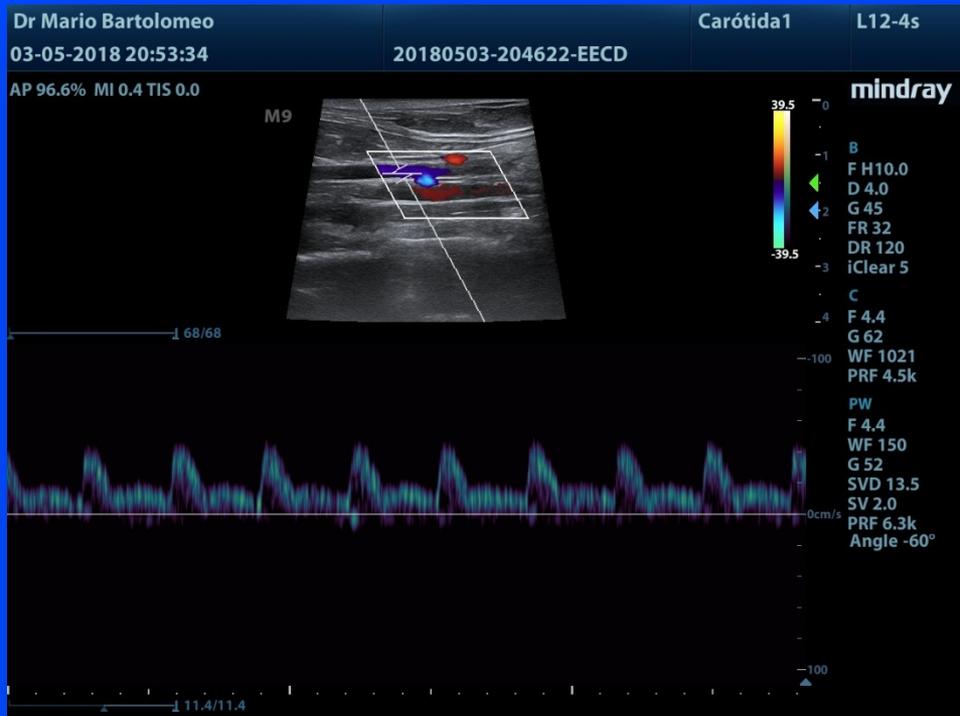
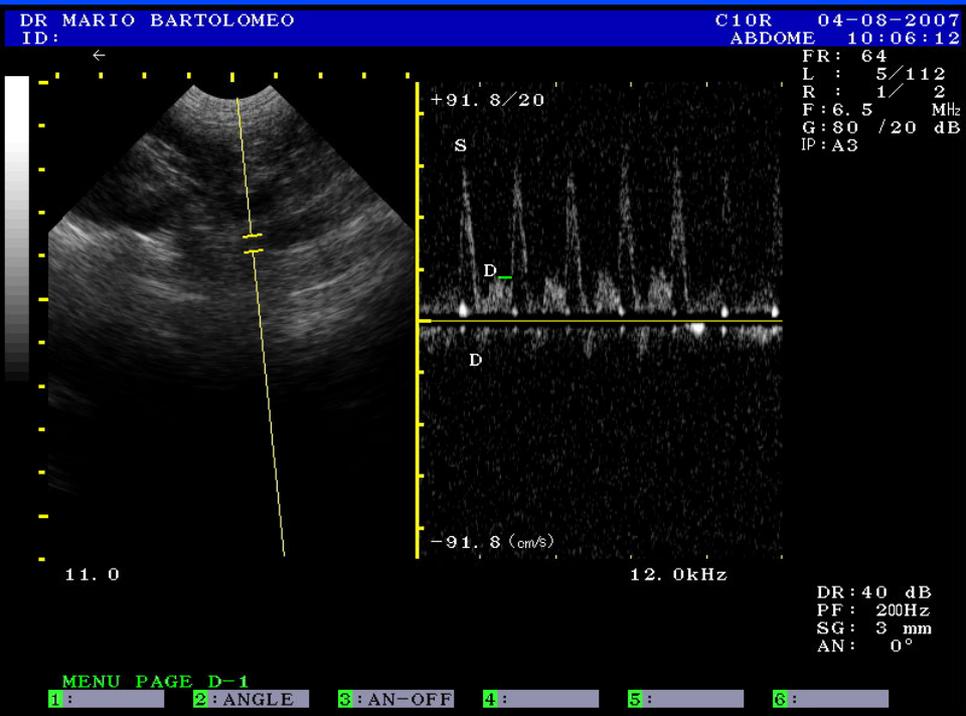


Fig. 3. Características de las estenosis arteriales.

Fig. 3. Características de las estenosis arteriales.

# ECODOPPLER AÓRTICO



# DOPPLER DE FLUJO



# Peripheral and Central Venous Blood Glucose Concentrations in Dogs and Cats with Acute Arterial Thromboembolism

S. Klainbart, E. Kelmer, B. Vidmayer, T. Bdolah-Abram, G. Segev, and I. Aroch

**Background:** Acute limb paralysis because of arterial thromboembolism (ATE) occurs in cats and less commonly in dogs. ATE is diagnosed based on physical examination findings and, occasionally, advanced imaging.

**Hypothesis/Objectives:** Peripheral, affected limb venous glucose concentration is decreased in ATE, whereas its systemic concentration is within or above reference interval.

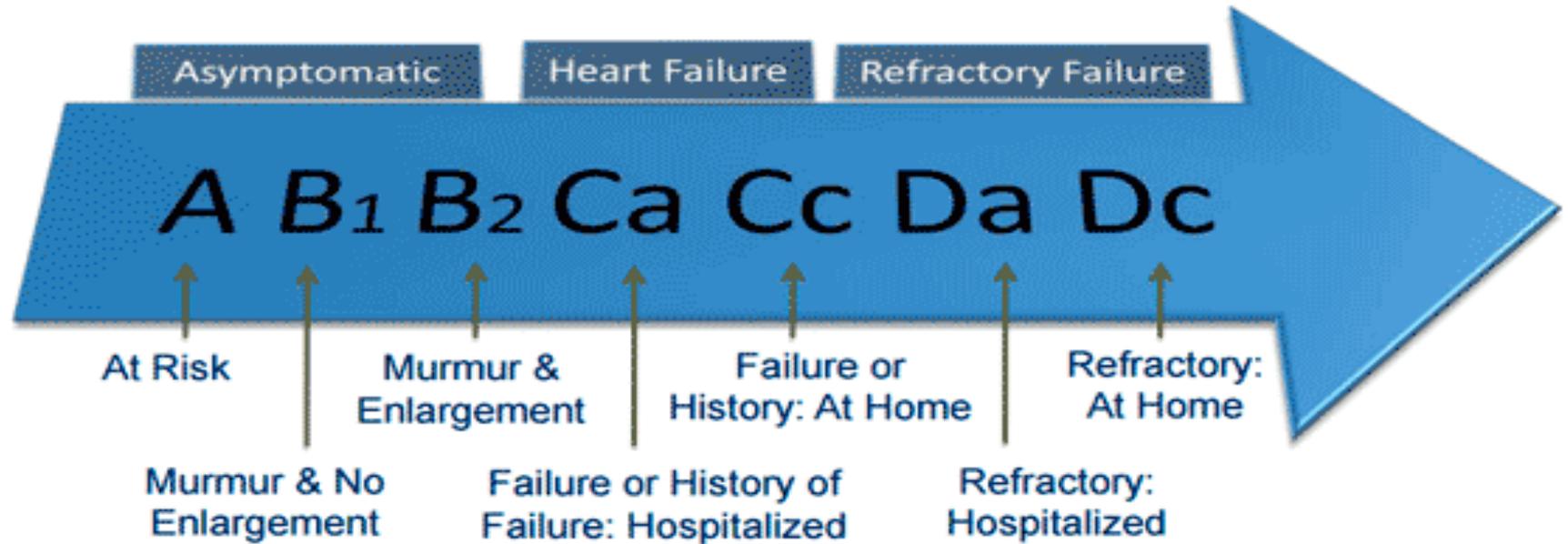
**Animals:** Client-owned cats and dogs were divided into 3 respective groups: acute limb paralysis because of ATE (22 cats and 9 dogs); acute limb paralysis secondary to orthopedic or neurologic conditions (nonambulatory controls; 10 cats and 11 dogs); ambulatory animals presented because of various diseases (ambulatory controls; 10 cats and 9 dogs).

**Methods:** Prospective observational, clinical study. Systemic and local (affected limb) blood glucose concentrations were measured. Their absolute and relative differences ( $\Delta\text{Glu}$  and  $\%\Delta\text{Glu}$ , respectively) were compared among groups.

**Results:**  $\Delta\text{Glu}$  and  $\%\Delta\text{Glu}$  were significantly higher in the ATE cats and dogs groups, compared to both of their respective controls ( $P < .0001$  and  $P < .001$ , respectively). No significant differences were observed between the control groups. Receiver operator characteristics analysis of  $\Delta\text{Glu}$  and  $\%\Delta\text{Glu}$  as predictors of ATE had area under the curve of 0.96 and 0.99 in cats, respectively, and 1.00 and 1.00, in dogs, respectively.  $\Delta\text{Glu}$  cutoffs of 30 mg/dL and 16 mg/dL, in cats and dogs, respectively, corresponded to sensitivity and specificity of 100% and 90% in cats, respectively, and 100% in dogs.

**Conclusions and Clinical Importance:**  $\Delta\text{Glu}$  and  $\%\Delta\text{Glu}$  are accurate, readily available, diagnostic markers of acute ATE in paralyzed cats and dogs.

# Clasificación del ACVIM



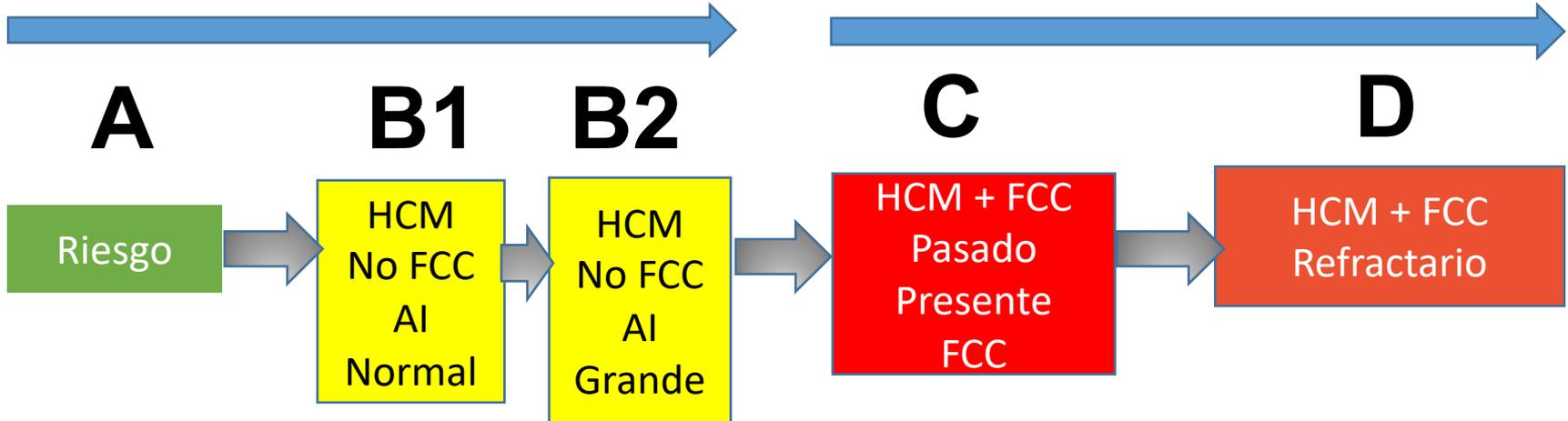
## TRATAMIENTO



Riesgo de Muerte cardiaca

Asintomáticos

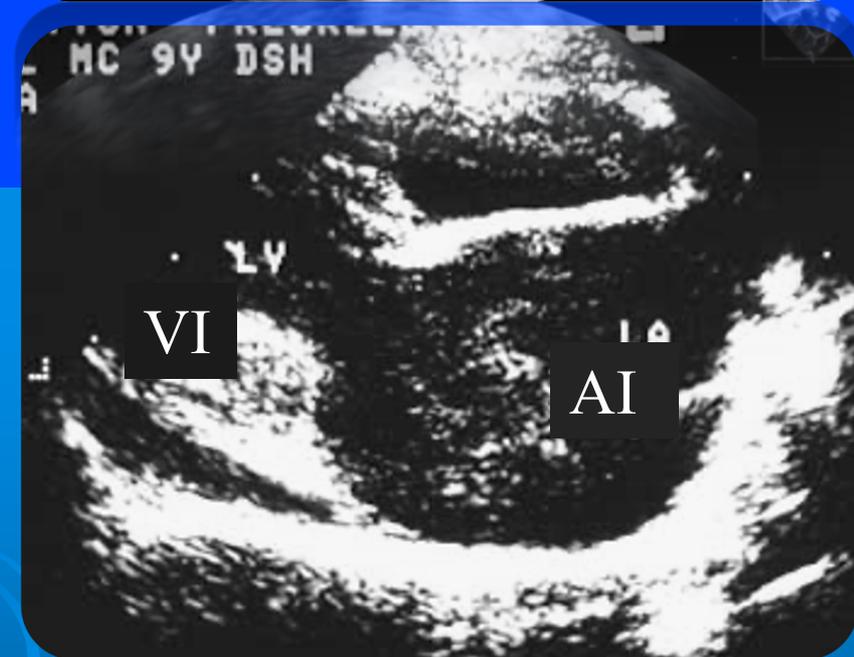
Sintomáticos



# TEA: PREVENCIÓN

## ¿Cuándo comenzar?...

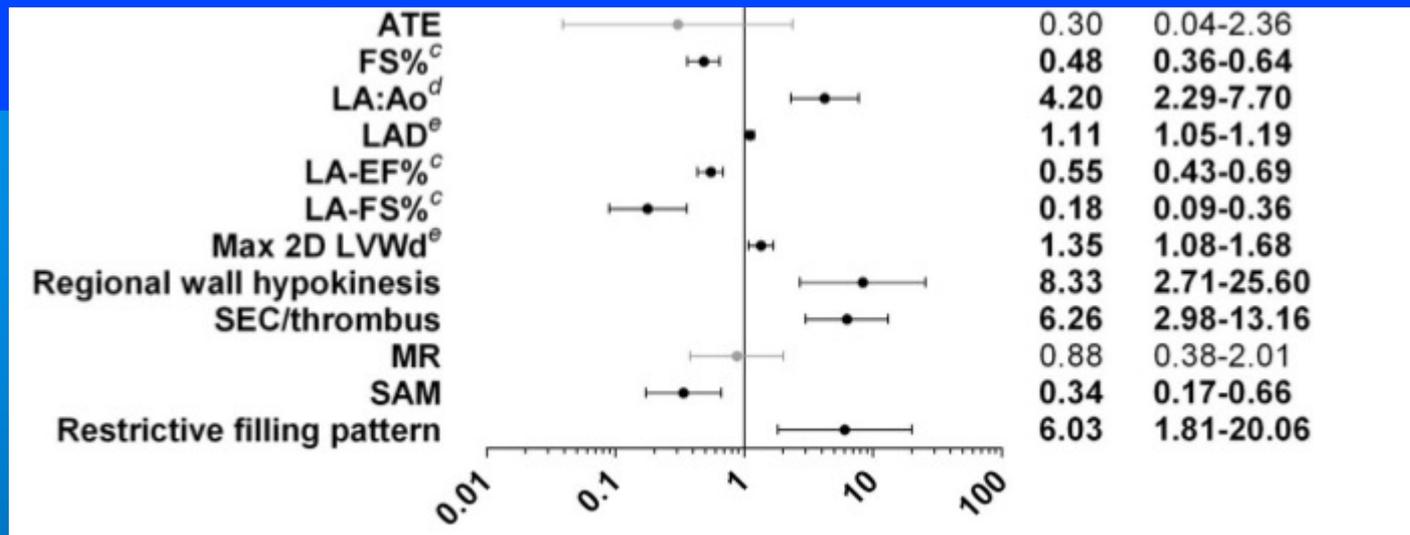
- Severo agrandamiento atrial izquierdo
- Contraste ecocardiográfico espontáneo
- Episodios previos de TEA
- Disfunción sistólica del atrio izquierdo
- Disfunción sistólica del ventrículo izquierdo



# Risk factors associated with sudden death vs. congestive heart failure or arterial thromboembolism in cats with hypertrophic cardiomyopathy

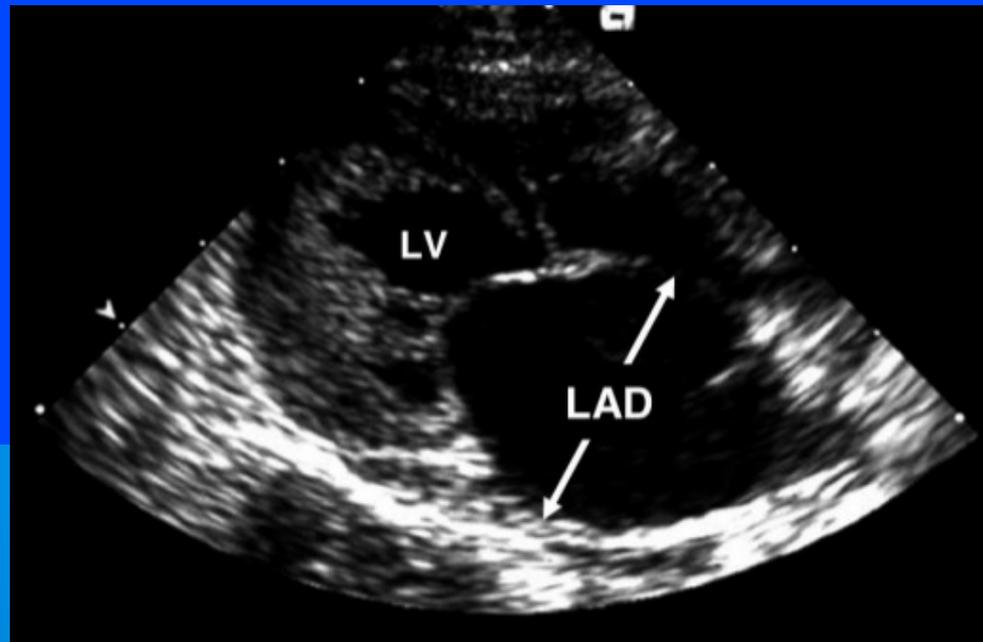


J.R. Payne, BVetMed, PhD <sup>a</sup>,  
 K. Borgeat, BSc (Hons), BVSc, MVetMed <sup>b</sup>,  
 D.C. Brodbelt, MA, VetMB, PhD <sup>a</sup>,  
 D.J. Connolly, BSc, BVetMed, PhD <sup>a</sup>,  
 V. Luis Fuentes, MA, VetMB, PhD <sup>a,\*</sup>



# RADIOGRAPHIC AND ECHOCARDIOGRAPHIC ASSESSMENT OF LEFT ATRIAL SIZE IN 100 CATS WITH ACUTE LEFT-SIDED CONGESTIVE HEART FAILURE

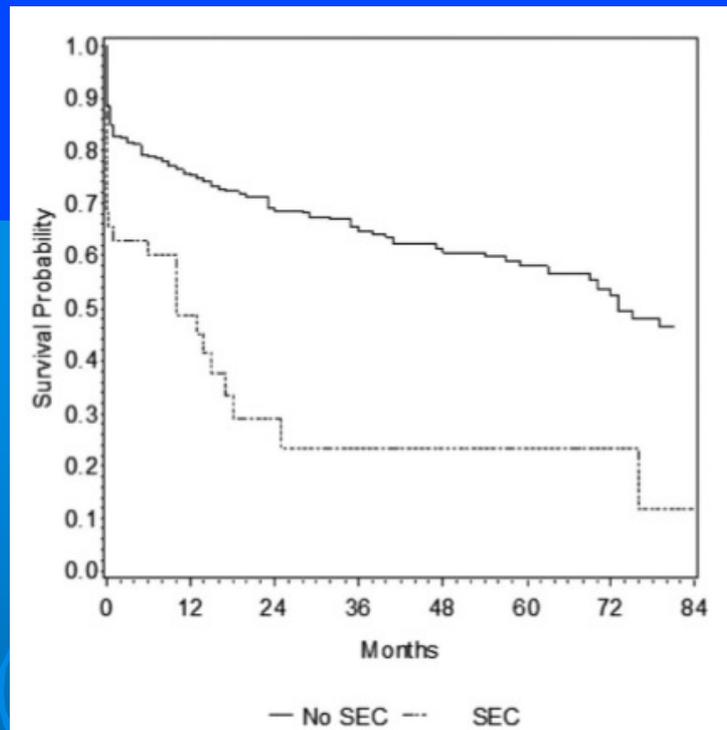
KARSTEN E. SCHOBER, ELLEN WETLI, WM TOD DROST



Diámetro de AI menor a 16 mm normal  
Moderada dilatación 20 mm  
Severa dilatación 25 mm

# Retrospective evaluation of the incidence and prognostic significance of spontaneous echocardiographic contrast in relation to cardiac disease and congestive heart failure in cats: 725 cases (2006–2011)

Courtney M. Peck, DVM; Lindsey K. Nielsen, DVM, DACVECC; Rebecca L. Quinn, DVM, DACVIM; Nancy J. Laste, DVM, DACVIM and Lori Lyn Price, MAS



# PREVENCIÓN DEL TEA

## ANTIPLAQUETARIOS

- **ASPIRINA** inhibe irreversiblemente a la ciclooxigenasa plaquetaria)

5 mg/gato/72 hs – 80 mg/gato/72 hs

- **CLOPIDOGREL** (bloqueo irreversible del receptor del ADP plaquetario)

18,7 mg /gato/24 hs - ¼ de tableta de 75 mg/ 24 hs

## ANTICOAGULANTES

- Heparinas de bajo peso molecular enoxaparina
- Inhibidor directo del factor Xa ( anticoagulante oral)

Apixaban - Rivaroxaban

# Feline Cardiogenic Arterial Thromboembolism

## Prevention and Therapy

Daniel F. Hogan, DVM

**Table 1**

**Suggested thromboprophylactic protocols for cardiogenic arterial thromboembolism prevention**

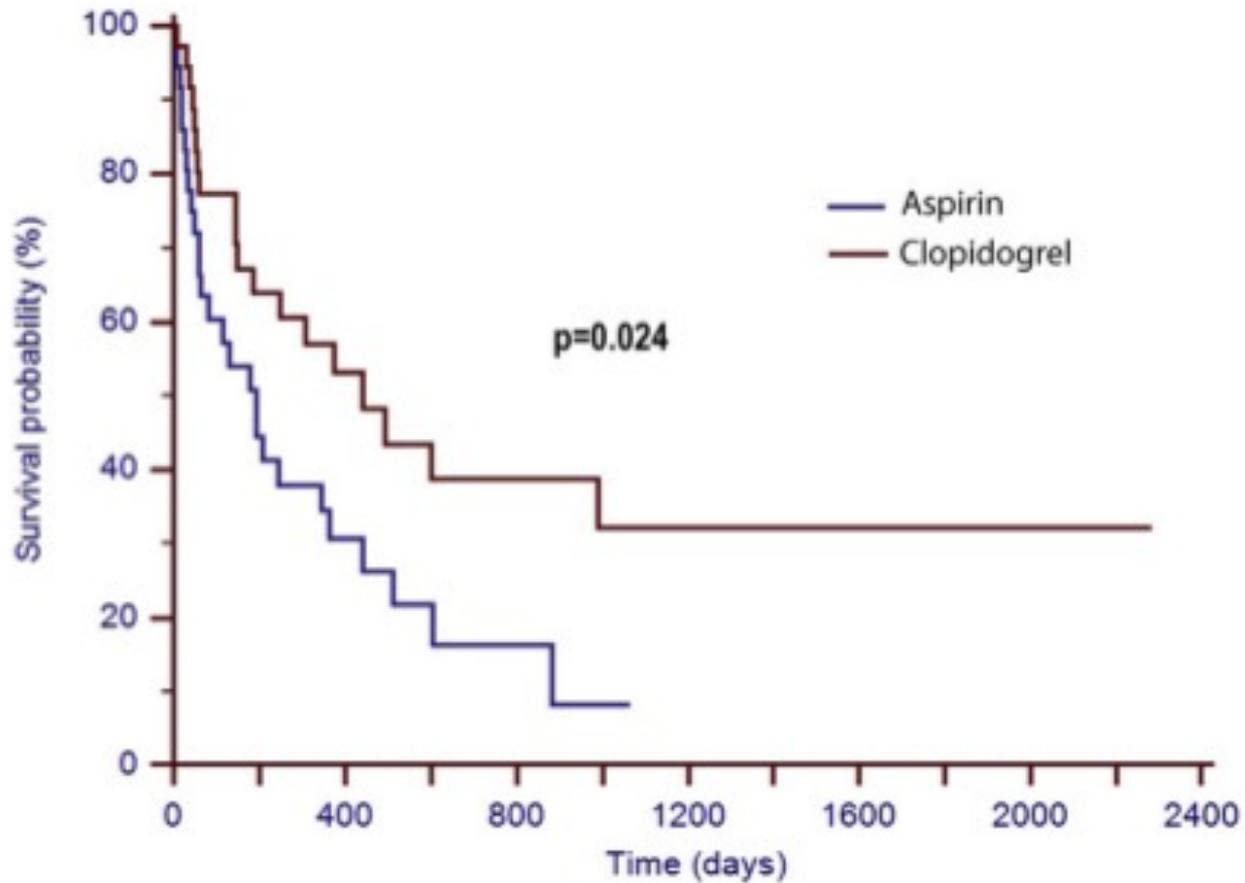
**Primary prevention**

|                              |                                                                |                                                                        |
|------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------|
| Left atrial dilation         | Basal<br>Consider-cost                                         | Clopidogrel<br>Aspirin                                                 |
| Spontaneous contrast present | Basal<br>Consider                                              | Clopidogrel<br>Clopidogrel + LMWH (more aggressive)                    |
| Left atrial thrombus present | Basal<br>Consider-preferred<br>Could consider                  | Clopidogrel<br>Clopidogrel + LMWH<br>Warfarin                          |
| Secondary prevention         | Basal<br>Consider-preferred<br>Could consider<br>Consider-cost | Clopidogrel<br>Clopidogrel + LMWH<br>Warfarin<br>Clopidogrel + aspirin |

# Secondary prevention of cardiogenic arterial thromboembolism in the cat: The double-blind, randomized, positive-controlled feline arterial thromboembolism; clopidogrel vs. aspirin trial (FAT CAT)

Daniel F. Hogan, DVM <sup>a,\*</sup>, Philip R. Fox, DVM, MS <sup>b</sup>,  
Kristin Jacob, DVM <sup>c</sup>, Bruce Keene, DVM, MS <sup>d</sup>,  
Nancy J. Laste, DVM <sup>e</sup>, Steven Rosenthal, DVM <sup>c</sup>,  
Kimberly Sederquist, RVT, VTS-Cardiology <sup>f</sup>,  
Hsin-Yi Weng, BVM, MPH, PhD <sup>g</sup>

clopidogrel (18.75 mg/cat PO q 24 h) or aspirin (81 mg/cat PO q 72 h)



443 days vs. 192 days

# Dual therapy with clopidogrel and rivaroxaban in cats with thromboembolic disease

*Journal of Feline Medicine and Surgery*  
1–7 © The Author(s) 2021

Sara T Lo<sup>1</sup> , Ashley L Walker<sup>1</sup>, Catherine J Georges<sup>1</sup>,  
Ronald HL Li<sup>2</sup> and Joshua A Stern<sup>3</sup> 

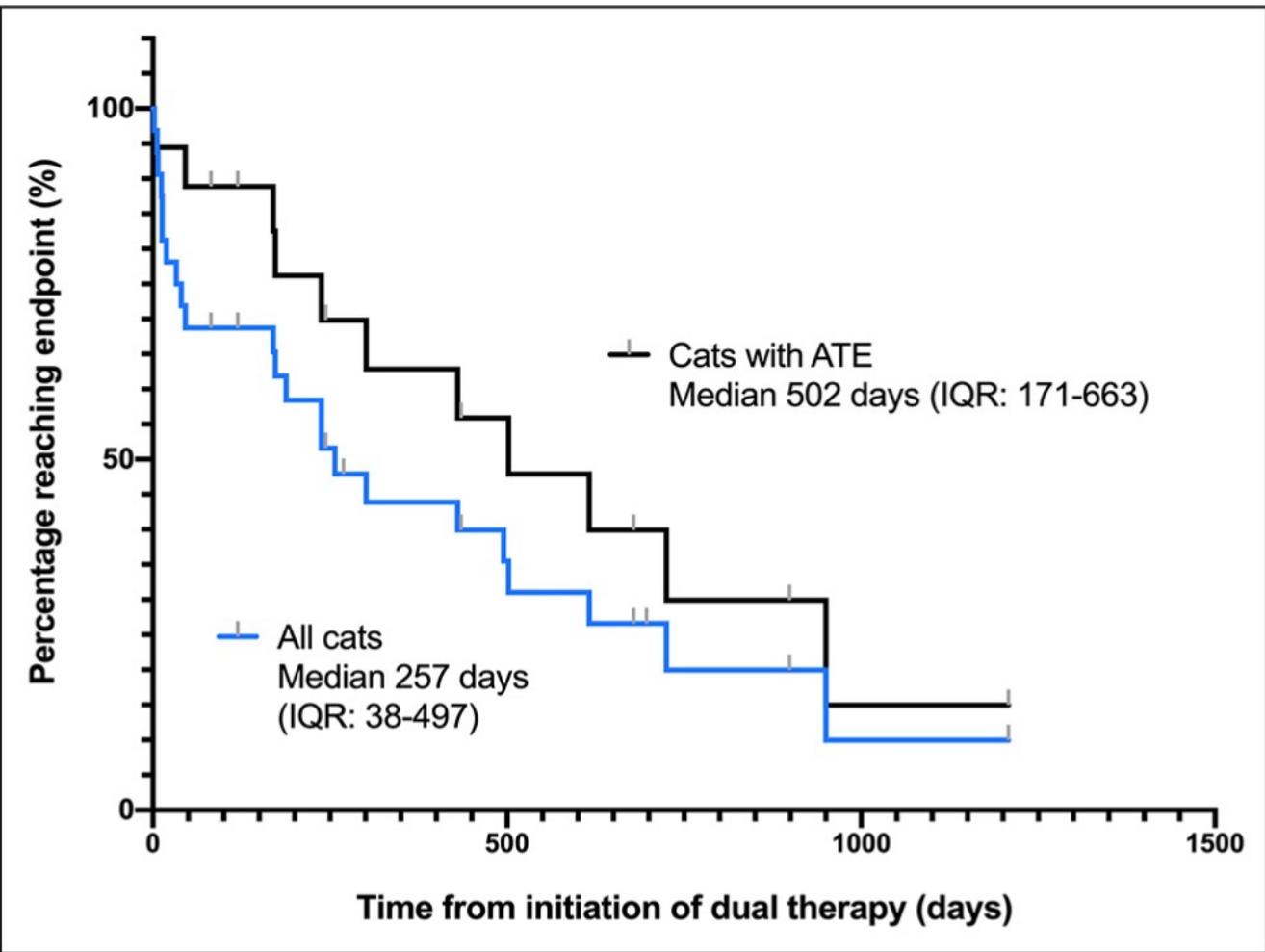
clopidogrel

**Table 2** Indication for initiation of dual clopidogrel and rivaroxaban therapy

| Indication                        | Number of cats (n = 32) |
|-----------------------------------|-------------------------|
| ATE                               | 7                       |
| Intracardiac thrombus             | 7                       |
| SEC                               | 1                       |
| ATE + intracardiac thrombus       | 2                       |
| ATE + SEC                         | 7                       |
| Intracardiac thrombus + SEC       | 6                       |
| ATE + SEC + intracardiac thrombus | 2                       |

ATE = arterial thromboembolism; SEC = spontaneous echo contrast

0 q24h)



period to have revealed some newly developed ATEs. The median survival time on dual therapy for post-ATE cats in this study was 502 days, which was longer than the median survival time on dual therapy (257 days) for all cats in the study. Previously published studies revealed a median survival in post-ATE cats of 184 days on aspirin, warfarin, low-molecular weight heparin or a combination of these medications (n = 43 cats),<sup>11</sup> 149 days on high-dose aspirin (n = 18 cats),<sup>2</sup> 105 days on low-dose aspirin (n = 24 cats),<sup>2</sup> and 94 days on aspirin, clopidogrel, heparin, a combination of these or no anticoagulant therapy (n = 30 cats).<sup>22</sup> The only prospective clinical trial evaluating clopidogrel in feline ATE found a median time of 346 days to a composite endpoint of recurrent ATE or cardiac death.<sup>15</sup> The 1-year survival rate of cats in this study after initial presentation of ATE was 50%. Other studies have reported 1-year survival rates post-ATE to be 20% and 0%.<sup>24,26</sup>

**Conclusions and relevance** Dual antithrombotic therapy with clopidogrel and rivaroxaban resulted in a low reported incidence of adverse events. Cats placed on dual therapy for an ATE event experienced a low rate of recurrence and effective thromboprophylaxis was achieved in cats with intracardiac thrombi or SEC.



# Consensus on the Rational Use of Antithrombotics in Veterinary Critical Care (CURATIVE): Domain 3—Defining antithrombotic protocols

Marie-Claude Blais DMV, DACVIM<sup>1</sup>  | Domenico Bianco DVM, PhD, DACVIM<sup>2\*</sup> | Robert Goggs BVSc, DACVECC, DECVECC, PhD, MRCVS<sup>3\*</sup>  | Alex M. Lynch BVSc(Hons), DACVECC, MRCVS<sup>4\*</sup> | Lee Palmer DVM, MS, DACVECC, NRP, EMT-T, WEMT, CCRP, TP-C<sup>5\*</sup>  | Alan Ralph DVM, DACVECC<sup>6\*</sup> | Claire R. Sharp BSc, BVMS, MS, DACVECC<sup>7\*</sup> 

## PICO QUESTION: Rivaroxaban therapy

### Guidelines

#### 3.14 Rivaroxaban (Dogs)

- a. Based on preliminary data, rivaroxaban appears safe and well tolerated in dogs.
- b. We suggest a dosage of 1–2 mg/kg/day in dogs.

#### 3.15 Rivaroxaban (Cats)

- a. Based on preliminary data, rivaroxaban appears safe and well tolerated in cats.
- b. We suggest a dosage of 0.5–1 mg/kg/day in cats.

# TEA: TRATAMIENTO

## 5 PUNTOS

1 TRATAMIENTO DEL DOLOR ( 24 – 48 hs )

2 REDUCIR LA CONTINUA FORMACION DE TROMBO

3 MEJORAR EL FLUJO SANGUINEO ARTERIAL  
AORTICO / CIRCULACION COLATERAL

4 TRATAR LA FALLA CARDIACA ( SI ESTA PRESENTE)

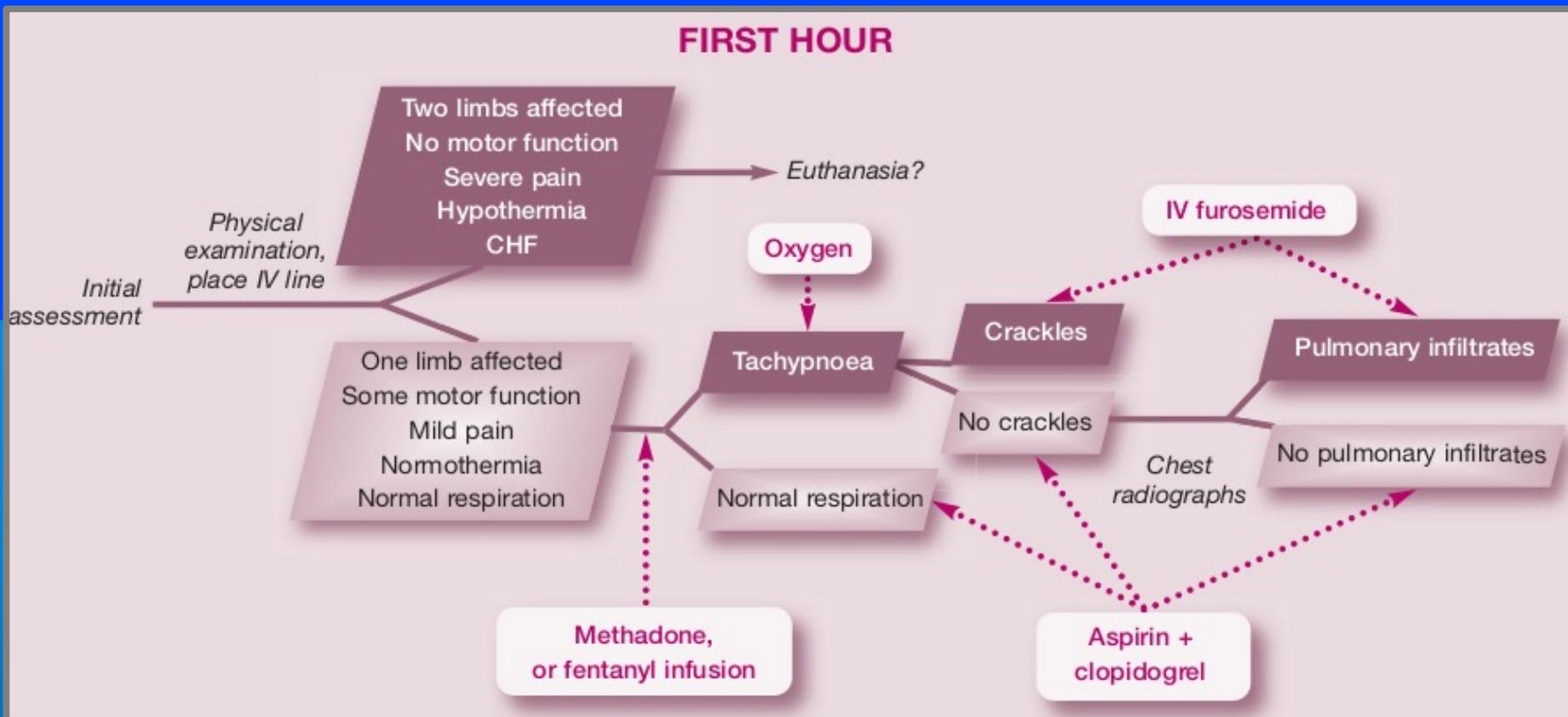
5 TERAPIA DE SOPORTE

# TROMBOEMBOLISMO

## Primera Hora



1 Dolor -2 Antitrombóticos 3 Antiplaquetarios 4 Fallo cardíaco

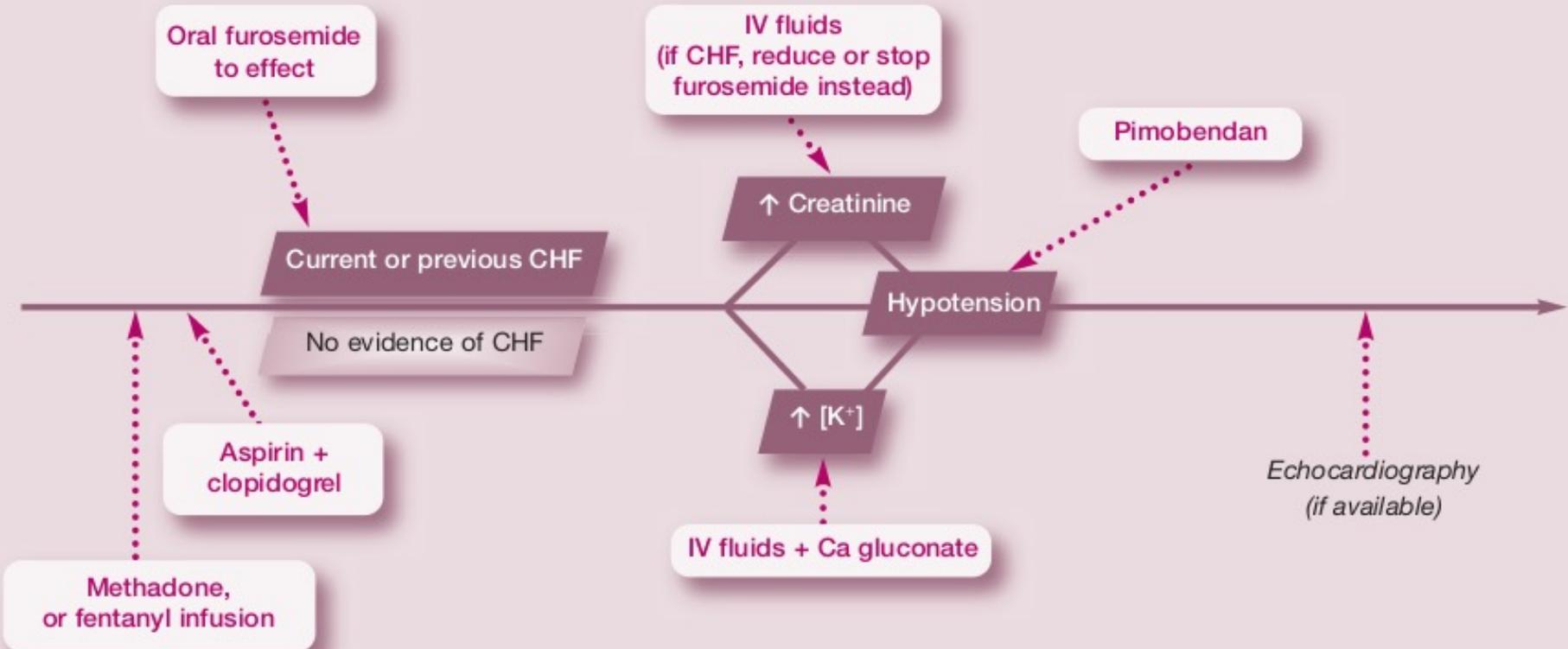


# Primeras 24 hs



---- Función renal - Electrolitos - Ecocardiografía

## FIRST 24 HOURS (after initial management)



# TRATAMIENTO

## 1 DOLOR:

**Fentanilo** 1 – 3 ug/kg IV bolo luego

2 – 3 ug /kg/hora

2/3 **Lisar o tratar de limitar la formación y/o el crecimiento del trombo / Mejorar el flujo sanguíneo arterial**

Terapia anticoagulante

**Enoxaparina** 1 mg /kg SC 8 – 12 hs

Terapia Trombolítica -antiplaquetarios

**Clopidogrel** 75 mg / gato primer dosis

18,75 mg /gato por dia

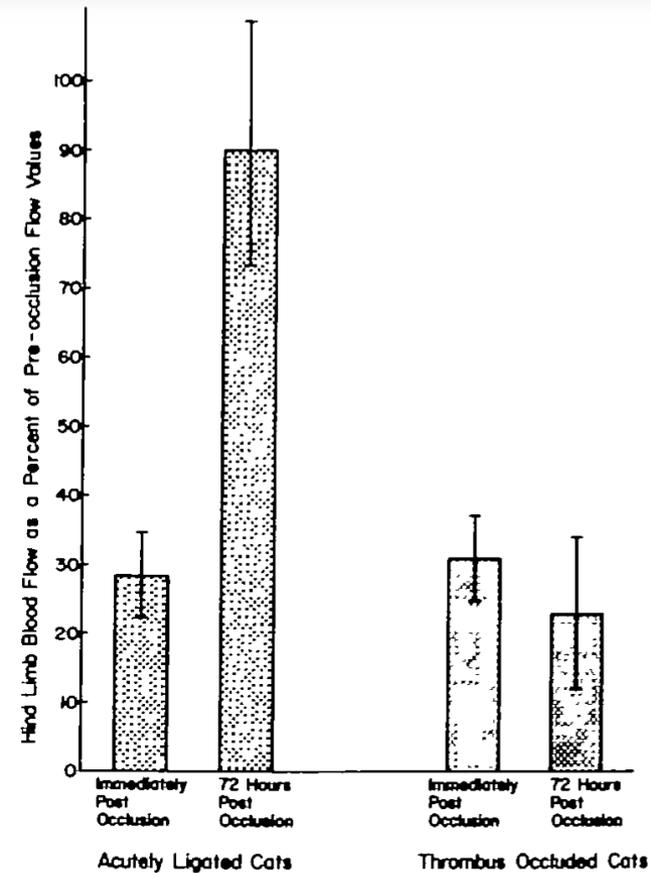
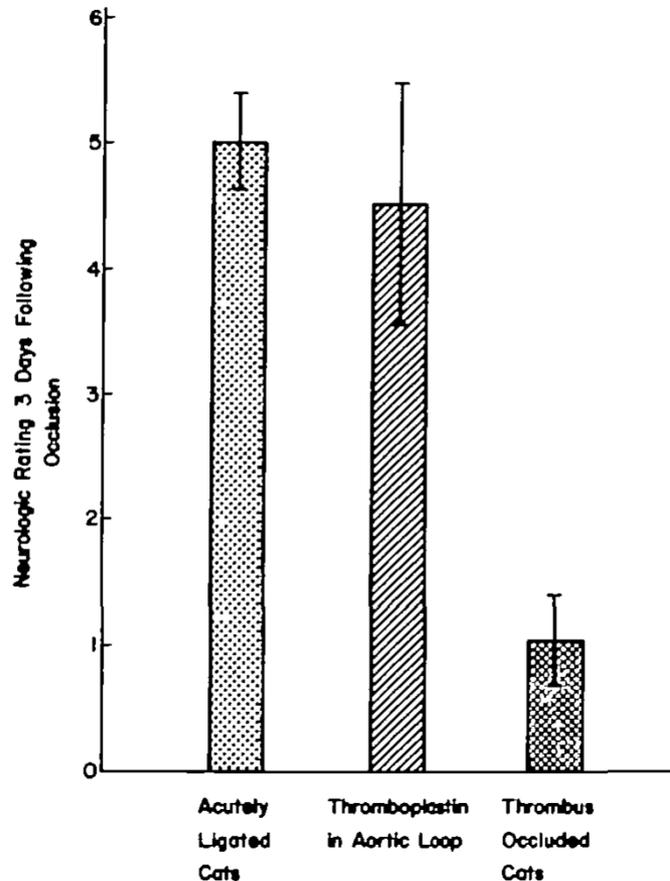
**Activador del plasminogeno tisular** ( antes de las 6 hs )

4 **Tratar la I.C.C.**

# Inhibition of Feline Collateral Vessel Development following Experimental Thrombotic Occlusion

R.G. SCHAUB, PH.D., K.M. MEYERS, PH.D., R.D. SANDE, D.V.M., AND G. HAMILTON, M.D.

Circulation Research. 1976;39:736-743



# Five-hydroxytryptamine antagonists and feline aortic embolism

MARVIN L. OLMSTEAD\* AND HUGH C. BUTLER†

Department of Surgery and Medicine, Kansas Agricultural Experiment Station,  
Manhattan, Kansas 66506

*J. small Anim. Pract.* (1977) **18**, 247–259.

TABLE 2. Summary of hind leg function observed in control group

| Function observed  | Number of cats |
|--------------------|----------------|
| Complete paralysis | 2              |
| Marked paresis     | 2              |
| Moderate paresis   | 5              |
| Mild paresis       | 1              |
| Normal             | 0              |

TABLE 4. Summary of hind leg function observed in cats given cyproheptadine

| Dosage (mg/kg) | Function observed | Number of cats |
|----------------|-------------------|----------------|
| 1.0            | Moderate paresis  | 1              |
|                | Mild paresis      | 5              |
|                | Normal            | 4              |
| 3.0            | Mild paresis      | 4              |
|                | Normal            | 2              |

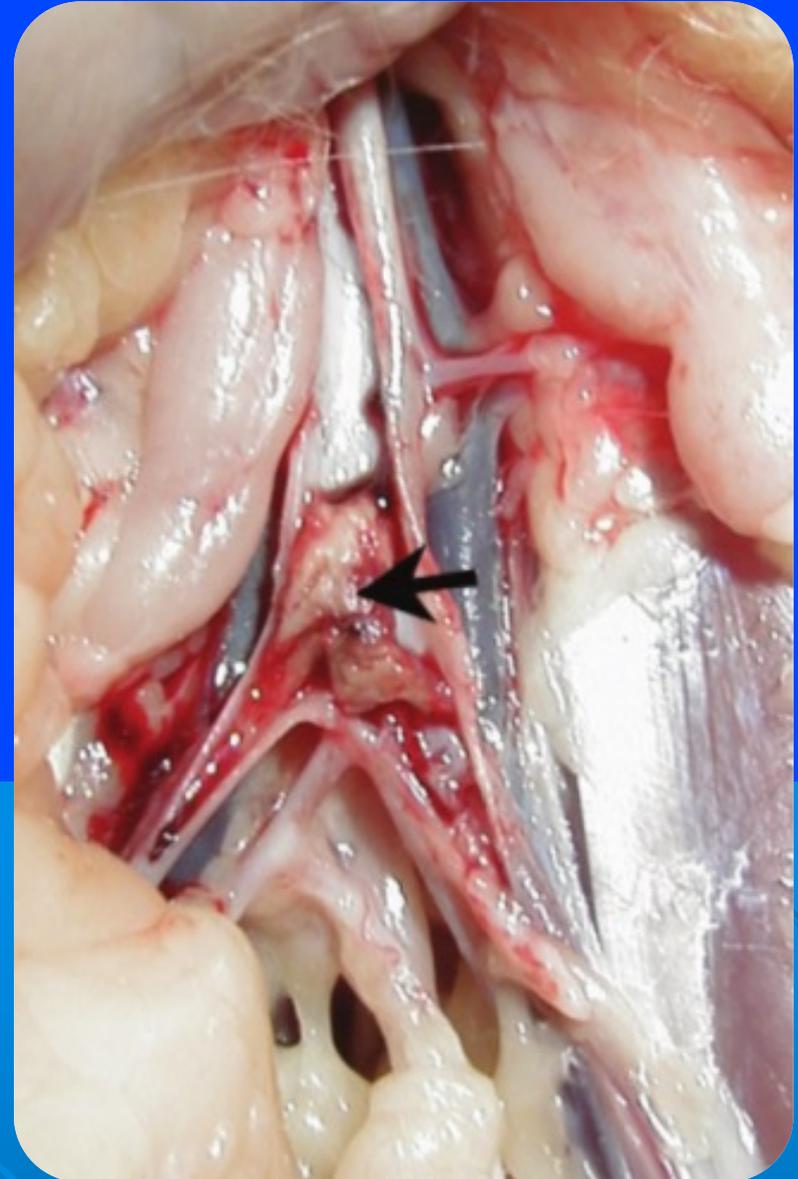
Circulación colateral



Plaquetas



**Tromboxano A / serotonina**



# Prospective evaluation of tissue plasminogen activator in 11 cats with arterial thromboembolism<sup>☆</sup>

Kristin M Welch DVM<sup>\*</sup>, Elizabeth A Rozanski DVM, DACVIM (SA-IM), DACVECC,  
Lisa M Freeman DVM, PhD, DACVN, John E Rush DVM, MS, DACVIM (Cardiology), DACVECC

(27%) were discharged alive from the hospital

Table 2. Summary of clinical findings, adverse effects and outcome.

| Cat | Limbs affected | Rectal temperature (°F) | Limb score <sup>*</sup> |     |      |      | Adverse effects were seen in 11/11 cats |                          |                  |            |                                |                    |               | Outcome    |
|-----|----------------|-------------------------|-------------------------|-----|------|------|-----------------------------------------|--------------------------|------------------|------------|--------------------------------|--------------------|---------------|------------|
|     |                |                         | 0 h                     | 4 h | 12 h | 24 h | Additional tPA dose at 4 h†             | Hyperkalemia >4.9 mmol/l | Neurologic signs | Arrhythmia | Azotemia creatinine >1.6 mg/dl | Acidosis pH <7.337 | 24-h survival |            |
| 1   | HL             | 92.4                    | 8                       | 6   | —    | —    | Yes                                     | Yes                      | Yes              | No         | Yes                            | Yes                | No            | Died       |
| 2   | HL             | 99.9                    | 6                       | 4   | 4    | 4    | No                                      | No                       | No               | Yes        | No                             | No                 | No            | Died       |
| 3   | RFL            | 99.5                    | 4                       | 1   | 1    | 1    | No                                      | No                       | Yes              | Yes        | No                             | No                 | Yes           | Discharged |
| 4   | HL             | 96.5                    | 8                       | 8   | 8    | 6    | Yes                                     | Yes                      | No               | Yes        | Yes                            | Yes                | No            | Died       |
| 5   | HL             | 98.2                    | 7                       | 3   | 2    | 2    | No                                      | No                       | No               | Yes        | No                             | No                 | Yes           | Died       |
| 6   | HL             | 102.7                   | 8                       | 6   | 6    | 6    | No                                      | Yes                      | Yes              | No         | Yes                            | No                 | Yes           | Died       |
| 7   | HL             | 102.6                   | 6                       | 5   | 5    | 5    | No                                      | No                       | Yes              | No         | No                             | No                 | Yes           | Discharged |
| 8   | HL             | 100.0                   | 4                       | 7   | 7    | 7    | Yes                                     | Yes                      | No               | No         | No                             | No                 | Yes           | Died       |
| 9   | HL             | 92.0                    | 8                       | —   | —    | —    | No                                      | No                       | No               | No         | No                             | No                 | No            | Died       |
| 10  | HL             | 98.7                    | 8                       | 8   | 8    | —    | No                                      | No                       | Yes              | No         | Yes                            | No                 | Yes           | Died       |
| 11  | HL             | 96.0                    | 8                       | 8   | 8    | 8    | Yes                                     | No                       | No               | Yes        | Yes                            | No                 | Yes           | Discharged |

HL = bilateral hind limbs affected; RFL = right forelimb affected.

<sup>\*</sup>Limb score detailed in Table 1.

<sup>†</sup>For cats with continued lack pulse to one or more limbs 4 h after initiation of treatment, an additional 5 mg tPA was administered as a continuous rate infusion.

voluntary motor function returned in 63% within 12 h of treatment.

4 h of treatment in 67%

# Thrombolysis with tissue plasminogen activator (TPA) in feline acute aortic thromboembolism: a retrospective study of 16 cases

*Journal of Feline Medicine and Surgery*  
1–7

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DOI: 10.1177/1098612X18778157

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This paper was handled and processed by the American Editorial Office (AAFP) for publication in *JFMS*



Julien Guillaumin<sup>1</sup> , Ryan MB Gibson<sup>2</sup>, Isabelle Goy-Thollot<sup>3</sup> and John D Bonagura<sup>1</sup>

*Conclusions and relevance* Survival and complication rates of TPA-treated cats and SOC-treated cats for acute FATE were similar.



# ACVIM consensus statement guidelines for the classification, diagnosis, and management of cardiomyopathies in cats

J Vet Intern Med. 2020;1–16.

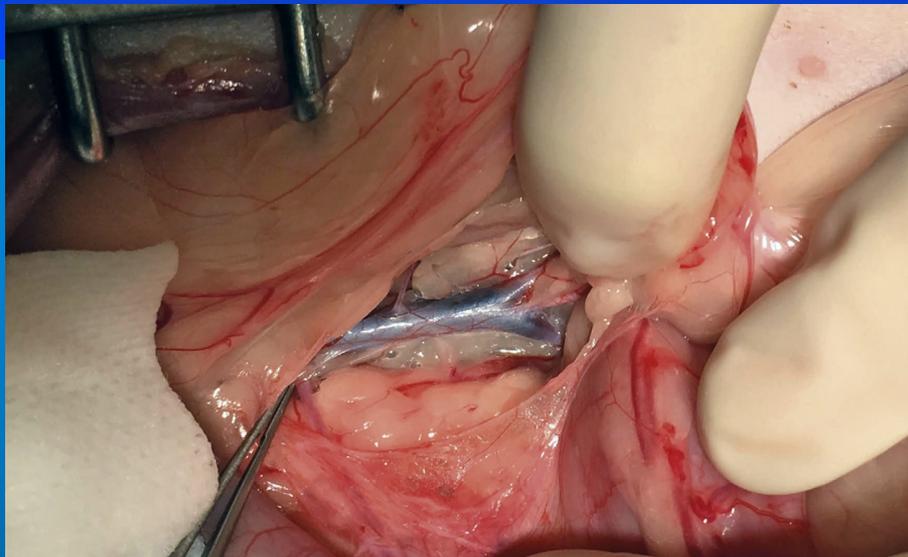
Thrombolytic treatment is not recommended for cats with ATE (LOE high).

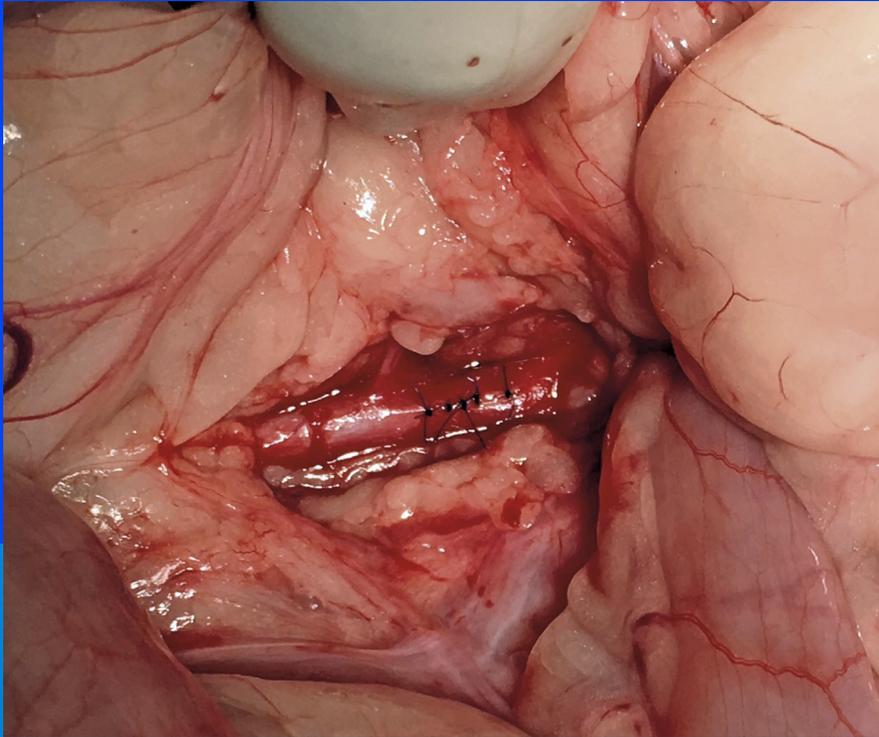
## Case Report

# Surgical embolectomy in a cat with cardiogenic aortic thromboembolism

T. Vezzosi, DVM, PhD<sup>a,b,\*</sup>, C. Buralli, DVM<sup>a</sup>, A. Briganti, DVM, PhD<sup>a</sup>, I. Vannozzi, DVM<sup>a</sup>, E. Giacomelli, MD, PhD<sup>c</sup>, G.F. Talamanca, DVM<sup>a</sup>, A. Sansoni, DVM<sup>d</sup>, O. Domenech, DVM, MS<sup>b</sup>, R. Tognetti, DVM, PhD<sup>a</sup>

Journal of Veterinary Cardiology (2020) 28, 48e54





# Use of Rheolytic Thrombectomy in the Treatment of Feline Distal Aortic Thromboembolism

S. Brent Reimer, Mark D. Kittleson, and Andrew E. Kyles

6 gatos

Antes

Después



# PRONÓSTICO

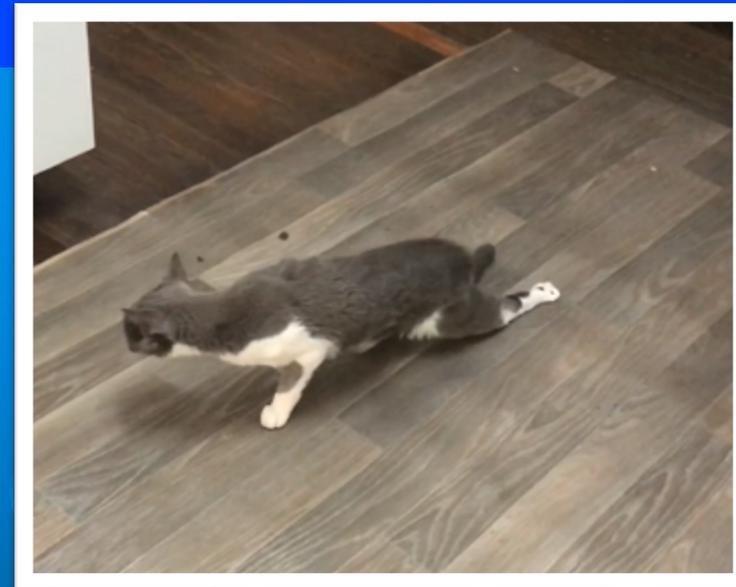
- Bajo porcentaje de recuperación
- Lenta recuperación
- Altas probabilidades de recurrencia

*¡Perfusión 48 – 72 hs!*

|                                |               |
|--------------------------------|---------------|
| Capacidad motora               | 10 – 14 días  |
| Capacidad motora significativa | 21 días       |
| Capacidad motora normal        | 4 – 6 semanas |

**Síndrome postrombótico**

**Recanalización -- colateralización**



# Conclusiones

## Arterial thromboembolism: risks, realities and a rational first-line approach



Virginia Luis Fuentes

### KEY POINTS

- ✦ ATE occurs most commonly in cats with advanced myocardial disease; such cats may be clinically silent.
- ✦ Diagnosis of ATE can usually be based on physical examination findings.
- ✦ Survival to discharge following ATE is more likely in normothermic cats with only one limb affected or some motor function present.
- ✦ Prognosis is worse in cats with CHF, but some cats can be tachypnoeic due to pain in the absence of CHF.
- ✦ Effective analgesia is essential for the first 24–48 h and is best provided by methadone or a fentanyl infusion.
- ✦ Antithrombotic treatment need not be complicated – clopidogrel and aspirin can be used in the treatment of cats with ATE, as well as for prevention.



**Muchas gracias**