



**PATIENT**

Angel Hemphill

**SPECIES**

Canine

**BREED**

Cairn Terrier

**SEX**

FS

**AGE**

13 years

**WEIGHT**

14

**INTERPRETED BY**

Maggie Machen Lamy,  
DVM, DACVIM  
(Cardiology)

**IMAGING PERFORMED BY**

Dr. Masloski

**HOSPITAL NAME**

Mass Veterinary  
Services

**REFERRING VET**

Dr. Masloski

**INVOICE**

25949

**DATE**

8/22/22

**PRESENTING CLINICAL SIGNS**

History: Angel continued to have syncopal episodes in April so had her sildenafil increased. This did not help and given her previous history of intermittent bradycardia, she had her diltiazem stopped which did seem to help for a bit. The syncopal episodes started again in June at which time the sildenafil was increased further. In May, Angel UPC was noted to higher so her enalapril was increased to address this. The sildenafil was further increased to it's present dose in July in an attempt to better control her syncopal episodes. Angel continues to have episodes where she shakes and falls over with some occasional panting noted. These appear to be occurring on an every other day basis at this point--sometimes associated with wanting foods, other times with no obvious cause. Angel is not as active but continues to eat well. She does not have any C/S/D/PU/PD but does vomit yellow bile occasionally.

Current medications: 1) Pimobendan/vetmedin 3.75mg 1/2 tab twice a day 2) Lasix/furosemide 12.5mg prn (?) 3) Sildenafil 20mg 3/4 tab three times a day 6) Omega 3 FA 1 twice a day 7) Diltiazem 30mg **discontinued** 8) Plavix/clopidogrel 75mg 1/4 tab daily 9) Enalapril 2.5mg 1.5 tabs twice a day most recent echo done 8/17/22

**HOLTER MONITOR FINDINGS AND RHYTHM ASSESSMENT**

Time analyzed	23:15h
Mean heart rate	121bpm
Maximum heart rate	240bpm
Minimum heart rate	64bpm
VPCs	0 (1 escape)
APCs	108404; 1943 pairs, 11889 runs

Interpretation: Underlying normal sinus rhythm; inappropriate HR variation. Rare 2<sup>nd</sup> degree AV block. Multiple >5s pauses (longest 8.9s). Frequent supraventricular arrhythmias, with sustained SVT

Rhythm diagnosis: Sick sinus syndrome with inappropriate rapid SVT contrasting extended periods of sinus arrest without escape foci.

**RECOMMENDATIONS**

The holter findings are most consistent with Sick Sinus Syndrome (SSS), a form of sinus node dysfunction. There are inappropriate periods of sinus arrest without an appropriate escape focus, coupled with brief SVT, occasional 2<sup>nd</sup> degree AV block and APCs.

SSS is idiopathic in origin, with progressive deterioration of the electrical system resulting in inappropriate tachycardia, bradycardia, intermittent lethargy and collapse. Typically SSS heart rates range from asystole to tachycardia as is seen here, making medical therapy nearly impossible to utilize safely. Unfortunately the patient did not experience syncope with the holter monitor in place, making it hard to know if the cause is asystole or SVT (or neither with a history of severe PAH); however, asystole is more commonly the issue. Treatment of bradycardia (heart rate stimulants) can exacerbate inappropriate tachycardia, and is often an ineffective treatment. Full systemic evaluation through lab work and potentially an AUS is advised to ensure no neoplastic or metabolic derangements are contributing.

What is particularly difficult in this case is we have already attempted medical management through us of diltiazem with variable results. The sildenafil dose has been increased, essentially treating what is treatable in this complicated case. Given the complexity of this case, **highly**



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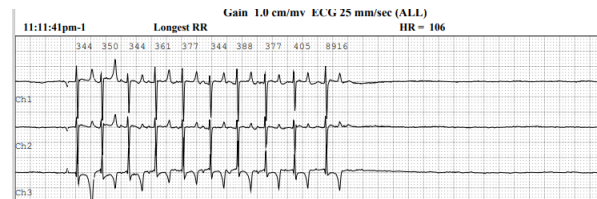
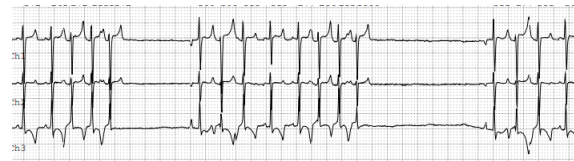
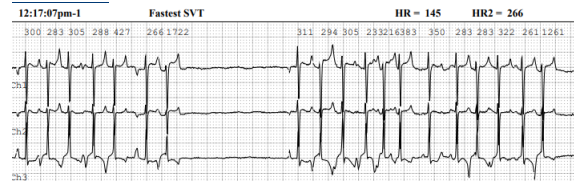
8/22/22

**recommend referral to a local Cardiologist for consultation regarding pacemaker implantation if desired.** The first step is determining the cause of syncope as discussed, and an event monitor may be necessary. From there, possible advanced medical and/or surgical options (pacemaker implantation) can be discussed. The severity of the patient's structural disease must also be considered in any possible options going forward, as even with correction of the arrhythmia this may limit outcome in this senior dog. Any patient with electrical disturbances can experience progressive debilitating syncope and potentially sudden death and the owner should be made aware of this possibility.

If referral is declined, further rate/rhythm control is not advised at this time and if QOL suffers euthanasia should be considered.

Plan: Continue all current medications as prescribed. Referral to a local Cardiologist is recommended (event monitor, advanced medical therapy, pacemaker, etc).

**IMAGES**



The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance please contact me.

**Maggie Machen Lamy, DVM**  
Diplomate of the American College of Veterinary Internal Medicine (Cardiology)  
info@sonopath.com