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PARACLINICAL ASSESSMENT OF CARDIOVASCULAR AND THYROIDAL
FUNCTION IN SPHYNX CATS

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Abstract:

Sphynx cats are known to have a predisposition to cardiovascular disorders, which may be influenced by thyroid hormone imbalances, particularly thyroxine (T4). This study aimed to assess the cardiac morphology and function of Sphynx cats through electrocardiographic (ECG) and echocardiographic (ECHO) evaluations, correlating findings with thyroid hormone levels. The analysis of ECG recordings highlighted signs of hypertrophic cardiomyopathy, ischemic changes, and rhythm disturbances, while echocardiographic measurements revealed structural alterations, particularly in ventricular morphology. Additionally, biochemical markers such as NT-proBNP and cardiac enzymes were assessed for their diagnostic value. Findings suggest a potential association between thyroid function and cardiac hypertrophy in Sphynx cats, reinforcing the need for routine cardiovascular and endocrine screening in this breed.

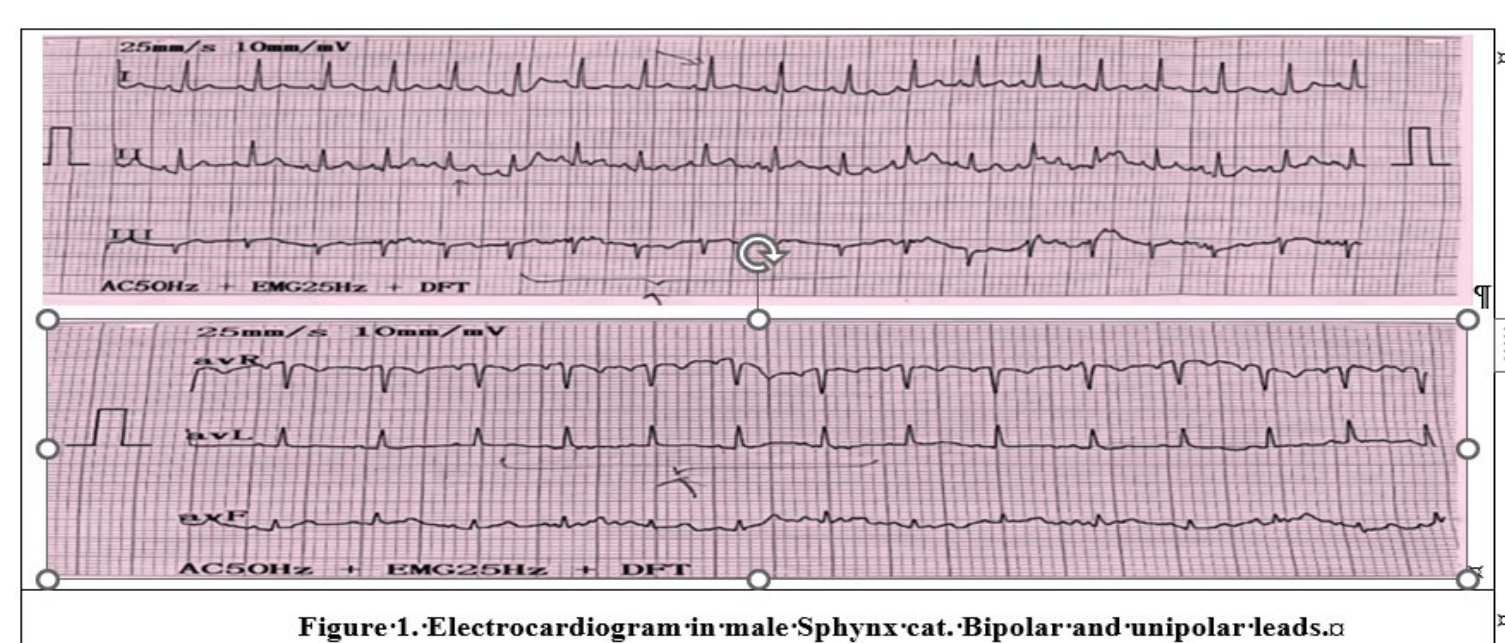
• Introduction

Hypertrophic cardiomyopathy (HCM) is a prevalent and often subclinical cardiac disorder in cats, particularly in genetically predisposed breeds such as the Sphynx, where mutations like ALMS1 are implicated. Thyroid hormones significantly influence cardiac metabolism, and hyperthyroidism may mimic or exacerbate HCM-like changes. This study aimed to assess the cardiovascular status of Sphynx cats by evaluating structural and functional cardiac alterations and exploring correlations with thyroid hormone levels. The results highlight the importance of integrated cardiovascular and endocrine screening to enable early diagnosis and improve clinical management in at-risk feline populations.

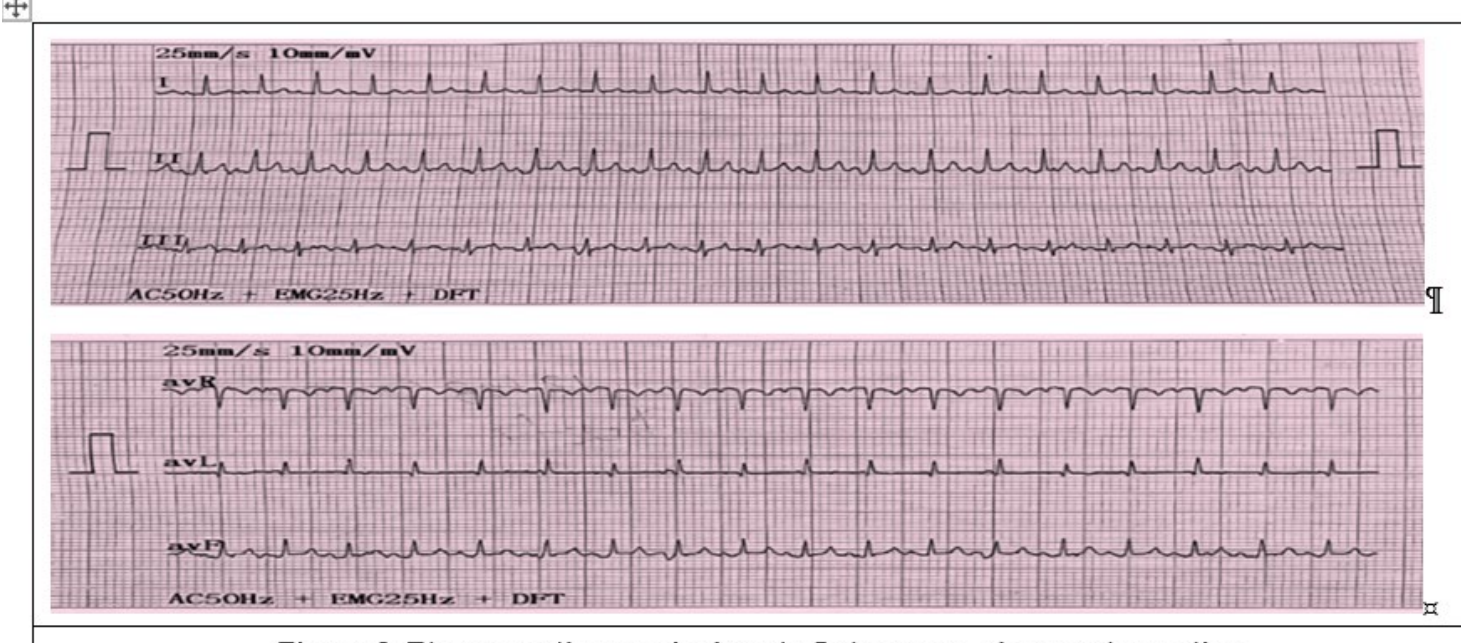
• Material and method

Eight Sphynx cats underwent clinical screening to exclude systemic disease prior to cardiac evaluation. Cardiac assessments included electrocardiography (ECG) using a 12-lead Contec-type device to analyze heart rate, wave morphology, QRS amplitude, and ST segment deviations, as well as echocardiography performed with a Chison 2 Vet system in B- and M-mode via the right parasternal approach. Key parameters included septal and ventricular wall thickness, chamber dimensions, fractional shortening (FS), and LA/Ao ratio. Complementary biochemical tests evaluated serum thyroxine (T4), cardiac enzymes (TGO, CK, LDH), electrolytes (Na, K), and NT-proBNP levels to assess myocardial integrity and detect subclinical dysfunction. Data were statistically analyzed using SPSS v23, and results were interpreted in the context of existing literature on feline cardiovascular health.

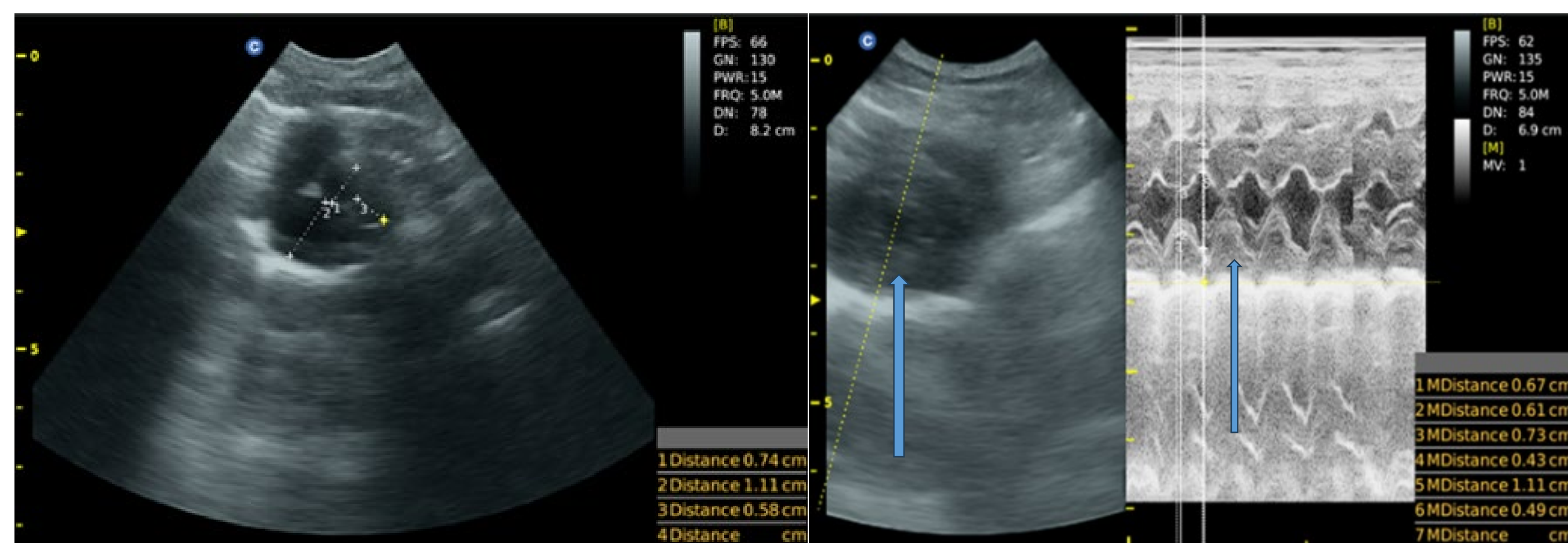
• Results and discussions



Parameters	Obtained values
CF	160 bpm
Rhythm	sinus
Ax	intermediate
Heart	verticalized
P wave	0,04s/0,15mV
PQ	0,12s
QRS	0,04s/0,65mV
QT	0,2s
ST	+0,1mV



Parameters	Obtained value
CF	220 bpm
Rhythm	Sinus
Ax	intermediate
Heart	horizontalized
P wave	0,05s/0,1mV
PQ	0,1s
QRS	0,04s/0,6mV
QT	0,25s
ST	isoelectric

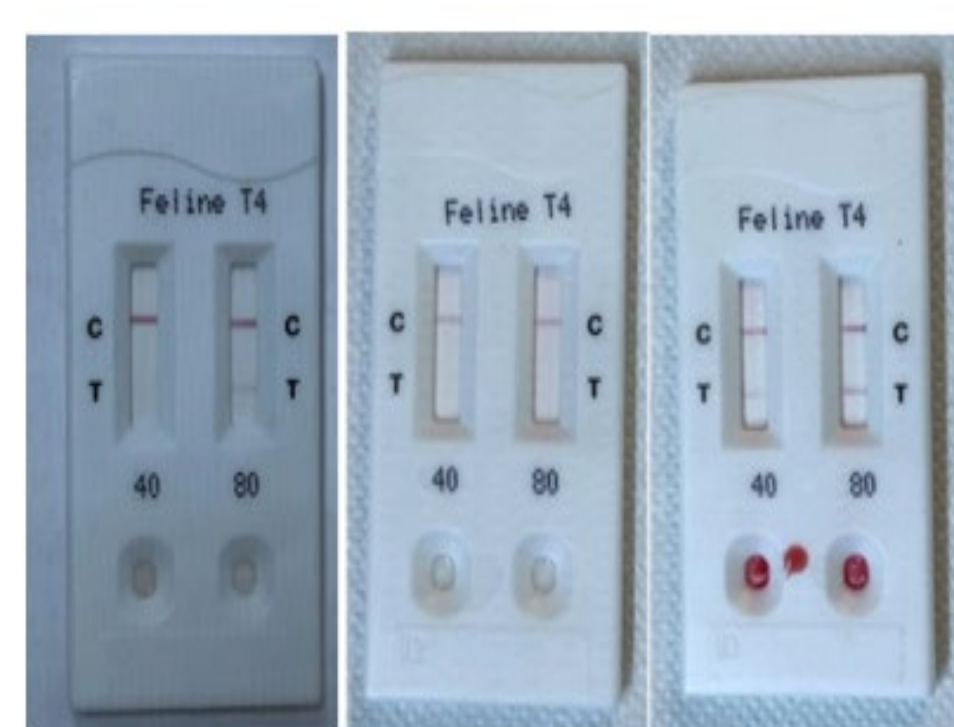
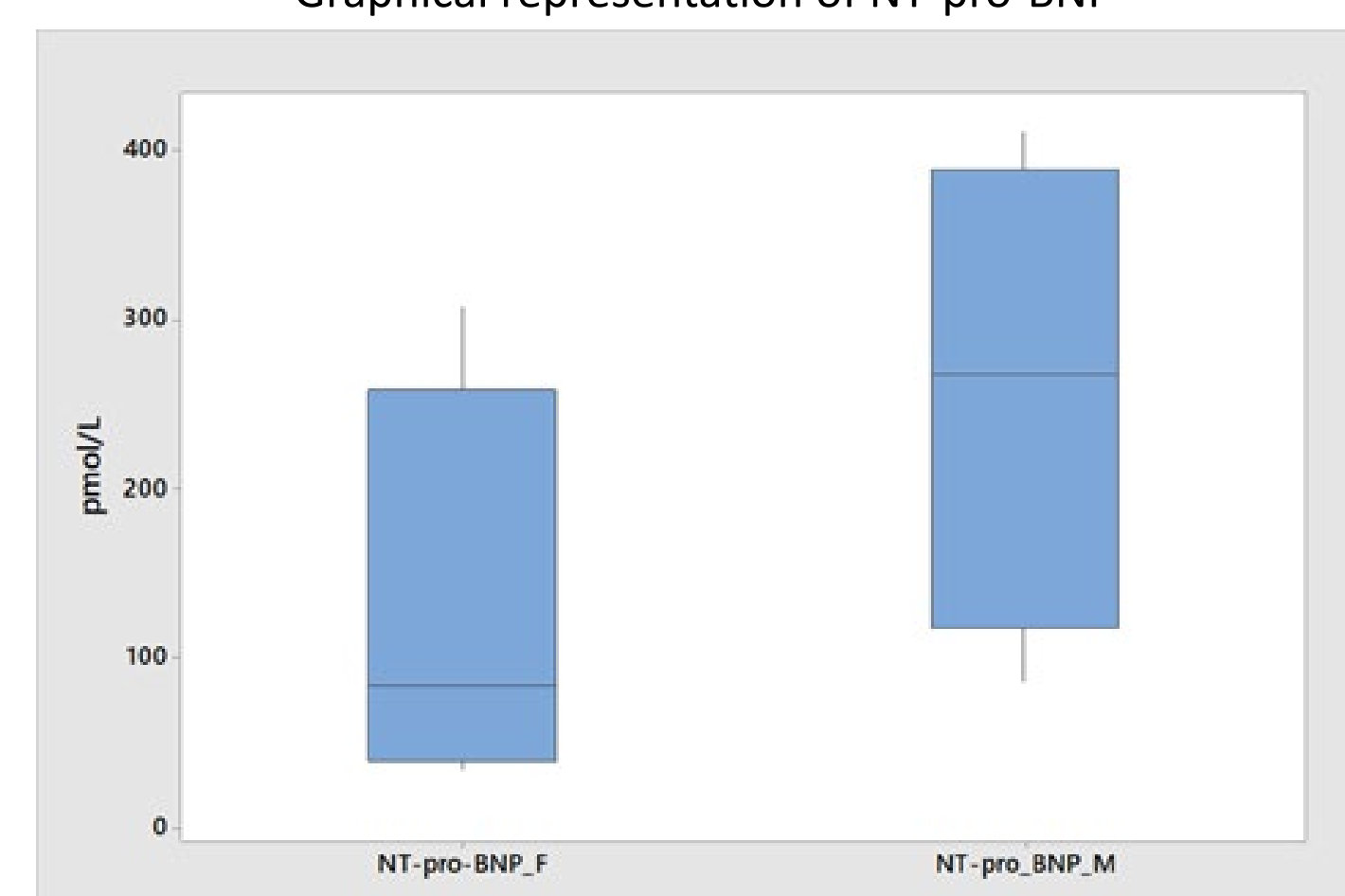


Examination in echocardiographic B and M mode

Mean and statistical indices of biochemical parameters in Sphynx cats

Specify		Mean	Std.	Std. Error	Std. Deviation	Value	
						Minimum	Maximum
TGO (UI/L)	F	65.50 ^a	18.612	37.225	19.00	108.00	
	M	85.25 ^a	34.548	69.096	22.00	172.00	
CK (UI/L)	F	132.25 ^a	15.992	31.983	94.00	162.00	
	M	117.25 ^a	10.734	21.469	96.00	142.00	
LDL (UI/L)	F	228.50 ^a	54.371	108.743	71.00	301.00	
	M	127.00 ^a	43.106	86.213	55.00	242.00	
Na serie (mmol/L)	F	167.50 ^a	9.836	19.672	153.00	196.00	
	M	130.75 ^b	12.750	25.500	108.00	162.00	
K serie (mmol/L)	F	4.05 ^a	0.405	0.810	3.20	5.10	
	M	4.38 ^a	0.811	1.621	2.80	6.10	
NT-pro-BNP (pmol/L)	F	128.00 ^a	62.299	124.598	35.00	308.00	
	M	259.00 ^a	70.450	140.899	87.00	412.00	

Graphical representation of NT-pro-BNP



Rapid tests for the determination of thyroid hormone T4 in cats

Conclusions

Given the genetic predisposition of Sphynx cats to cardiac disorders, the implementation of a systematic cardiovascular monitoring protocol is recommended. Periodic electrocardiographic and echocardiographic evaluations enable early detection of electrical and structural abnormalities associated with hypertrophic cardiomyopathy. Routine measurement of serum thyroxine (T4) levels supports the identification of myocardial stress linked to hyperthyroidism, while assessment of cardiac enzymes (CK, LDH, GOT) aids in the early diagnosis of myocardial injury. Monitoring serum NT-proBNP levels provides a reliable marker for subclinical myocardial hypertrophy and ischemic changes. Together, these diagnostic measures contribute to the effective detection and management of cardiac diseases in Sphynx cats, improving long-term prognosis.