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Cytological diagnosis of cardiac masses with ultrasound guided fine needle aspirates[☆]

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KEYWORDS

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Abstract *Background:* Cardiac masses are uncommon in the canine population. When present, an attempt should be made to obtain a definitive diagnosis. Our goal with this case series was to report that as long as anatomic location permits, obtaining fine needle aspirates (FNAs) for cytological evaluation is practical, safe, and may provide a definitive diagnosis.

Methods: Our database has been retrospectively searched for cases where FNA of cardiac masses have been performed.

Results: A total of six cases were retrieved. Four dogs were under general anaesthesia and two were sedated. Ultrasound guided transthoracic FNAs were obtained in all cases with only minor complications: mild self-limiting pericardial effusion (n = 1) and one ventricular ectopic complex (n = 1). All dogs were closely

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monitored during the procedure (pulse oximetry, electrocardiography and blood pressure). A diagnosis was obtained in all cases: inflammation (n = 1), haemangiosarcoma (n = 2), sarcoma (n = 2) and chemodectoma (n = 1).

Conclusion: A cytological diagnosis allows clinicians to make appropriate clinical decisions, has dramatic impact on treatment recommendations and gives information about prognosis.

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Abbreviations

AVB	atrio-ventricular block
cTnI	cardiac troponin I
ECG	electrocardiogram
FNA	fine needle aspirate
LV	left ventricle
RV	right ventricle
VHS	vertebral heart score
VPC	ventricular premature complex

Introduction

Cardiac masses are uncommon in the canine population, with an incidence between 0.12 and 5.73%.¹ When present, as in any other location, an attempt should be made to obtain a definitive diagnosis. The database of our referral centre has been retrospectively searched for dogs where a fine needle aspirate (FNA) of a cardiac mass has been attempted between January 2010 and December 2014. Six cases (all referrals) were retrieved and the procedure was successful in all of them. In order for a FNA to be considered, the mass had to have met the following criteria based on the clinician's judgement: 1. reasonable dimension (the smallest mass aspirated was 1.75 × 1.55 cm), 2. immobile (to allow ease of needle insertion) and 3. close to the thoracic wall. All the FNAs were performed after routine aseptic preparation and under ultrasonographic guidance. This allowed the best visualisation of the mass and assessment of a location to aspirate while avoiding blood vessels. The patient was positioned in either left or right lateral recumbency depending on tumour location. The FNA was performed in the standard fashion by a diplomate or resident in diagnostic imaging, using a 22G × 1 1/2" needle without negative pressure and a 5 mL airfilled syringe was used to eject the sample on to the slide, where it was smeared. Two dogs were sedated and four were under

general anaesthesia, all the dogs were closely monitored during the procedure with a simultaneous electrocardiogram (ECG), oscillometric blood pressure assessment and pulse oximetry (if under general anaesthesia). A defibrillator and anti-arrhythmic drugs were located in the same room, ready to be used if required. Minor complications were reported: mild self-limiting pericardial effusion in one dog and a ventricular ectopic beat in another dog. The FNA samples were analysed by two different experienced diplomates in clinical pathology. A diagnosis was obtained in all the cases. Histopathology confirmation was available in only one case, which was in agreement with the cytological diagnosis.

Our goal with this case series was to report that as long as anatomic location permits, FNA technique is practical, safe, and may provide a diagnosis based on which a targeted treatment can be recommended.

Case 1

A nine year-old female Bearded Collie (17 kg) was presented for investigation of bradyarrhythmia detected by the referring veterinarian. The owner reported a two-month history of lethargy, exertional presyncopal and one syncopal episode.

On admission the patient was bright and alert. A grade II/VI left basilar systolic murmur was detected; the heart rate was 60 bpm with a regular rhythm. Blood tests showed clinically insignificant abnormalities and elevated cardiac troponin I (cTnI; [Table 1](#)). Indirect systolic blood pressure was measured at 165 mm Hg. Analysis of a six-lead ECG revealed third degree atrio-ventricular block (AVB) with a variable escape focus and rate. Echocardiography revealed a large mass, not only visible most clearly in the interatrial septum and the right atrio-ventricular junction on right parasternal views but also visible surrounding the aortic root and within the region of the atrio-ventricular groove of the right ventricle (RV) in

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