

Ventricular Systolic Asynchrony in a Dog

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ABSTRACT

Asynchrony is characterized by the disruption of ventricular contraction and relaxation and left ventricle systolic performance loss. In this report, three years old female setter who was handed to animal hospital with exercise intolerance was discussed. At echocardiographic examination carried out because exercise intolerance, interventricular septum among with left ventricular post wall asynchronous movement compatible with ventricular asynchrony was monitored. During left parasternal apical four chamber examination, asynchronous movement was detected at both walls. Although cardiac asynchrony is probably a common case in dogs, it is ruled out because of the lack of clinical evidence in veterinary area like in the case of human medicine. It can be concluded that this disease has clinical significance because of the probability of heart failure, and therefore, needs to be considered in the echocardiographic examinations.

Key Words: ECG, Echocardiography, Heart, Systolic Function.

Bir Köpekte Sistolik Asenkroni Olgusu

ÖZ

Asenkroni; ventriküler kasılma ve gevşeme prosesindeki bozulma ve sol ventriküler sistolik performans kaybı ile karakterizedir. Sunulan vakada, hastanemize egzersiz intoleransı şikayeti ile getirilen üç yaşlı, dişi Setter ırkı köpek tartışıldı. Gerçekleştirilen muayenede hastanın kalp ve solunum sayıları ve vücut ısısı normal olarak kaydedildi. Oskültasyonda akciğerin kraniyal loblarında bronşitis ile uyumlu sert veziküler sesler tespit edildi. Egzersiz intoleransı nedeniyle gerçekleştirilen ekokardiyografik muayenede, interventriküler septum ve sol ventrikülün dış duvarı arasında ventriküler asenkroni ile uyumlu hareket gözlemlendi. Sol parasternal apikal dört boşluk bakıda, her iki duvar arasında asenkronik hareket izlendi. Kardiyak asenkroni köpeklerde muhtemelen sık karşılaşılan bir durum olmasına rağmen, Veteriner sahada konu ile ilgili klinik bilgi eksikliği nedeniyle, beşeri hekimlikte olduğu gibi göz ardı edilmektedir. Sonuç olarak; bu hastalık kalp yetmezliğine neden olma ihtimali nedeniyle klinik olarak önem arz eder ve ekokardiyografik muayene sırasında dikkate alınmalıdır.

Anahtar Kelimeler: EKG, Ekokardiyografi, Kalp, Sistolik fonksiyon, Resenkronizasyon.

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INTRODUCTION

The left ventricular asynchrony can be investigated under three titles atrioventricular, interventricular, and intraventricular asynchronies. In asynchrony cases; as the contribution of early contracting segments to the systolic function is less, the late contracting segments increase the wall tension of early contracting segments. Consequently, as the systolic performance decreases, the wall tension and systolic end pressure increases and the relaxation decreases (Park et al. 1985, Heyndrickx et al. 1988, Otsuji et al. 1997, Bax et al. 2003). Echocardiography for the diagnosis of asynchrony plays an most important role in the medicine prescribed. M-mode, Doppler, tissue Doppler, and 3D echocardiography can be applied for diagnosing this disease (Bax et al. 2003, Mullens et al. 2007), and cardiac resynchronization therapy (CRT) can be used for the treatment (Heyndrickx et al. 1988, Breithardt et al. 2002, Mullens et al. 2007). Besides, benefits of ACE inhibitors and beta-blockers are also reported for treatment (Packer et al. 1996, Packer et al. 2001a, Packer et al. 2001b). No clinical case (non-experimental) relative to this has been reported so far in the world veterinary field to our knowledge according to Web of Science search.

Case Presentation

Three years old female setter, who were brought to the Afyon Kocatepe University Animal Hospital with coughing, anorexia, early fatigue complaints, were used in this study. During clinical examination, their pulse, number of inhalation, and body temperature were found to be normal. During auscultation, rigid vesicular sounds that are characteristic of bronchitis were detected on each cranial lobes of the lung.

Echocardiographic examination was done because of exercise intolerance. In the M-mode and left parasternal apical four-chamber examinations, movements contributing to “intraventricular asynchrony” were observed between the left ventricle outer wall and interventricular septum .

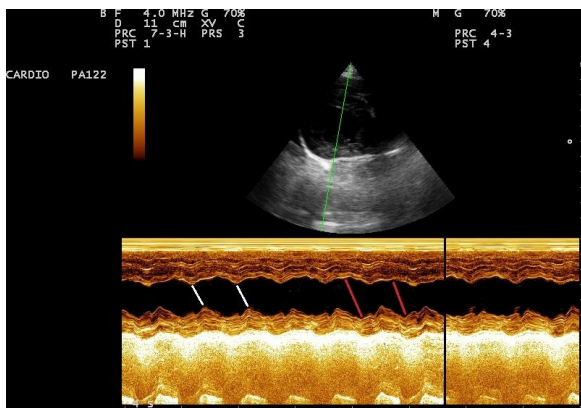


Figure 1: Right parasternal short axis view.

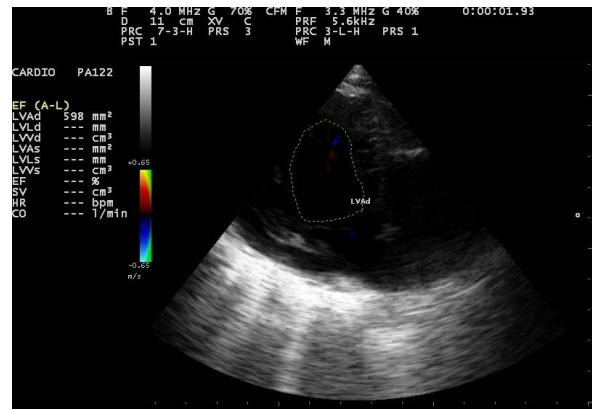


Figure 2: Left parasternal apical four chamber view.

Recreation and prescription diet was recommended to the patient. In the aim of lower respiratory tract disease (LRTD) treatment, 25 mg/kg sefuroksim, 1.1 mg/kg flunixin, and 10 mg/kg vit C were prescribed for a week. Not given any treatment for asynchrony and dog not brought back for control after treatment for LRTD.

DISSCUSSION and RESULTS

In the M-mode echocardiographic assessment, asynchrony was diagnosed with delays of septal posterior wall movement (Pitzalis et al. 2002, Bax et al. 2003, Mullen et al. 2007). In this study, similar delays were detected. The left ventricle segments work simultaneously at the normal working condition of the heart. In the case of intraventricular asynchrony, which is coherent with the case discussed in this study, left ventricle segments contract earlier or later. The outer wall of the left ventricle contracts later than the interventricular septum, similar to the presented case. The findings of 34 cardiac resynchronization treated patients and reported that the septum-lateral wall delay is important for diagnosing the intraventricular asynchrony by “semiautomatic endocardia border detection” in the echocardiographic apical four-chamber view (Breithardt et al. 2002). In this study, a systolic delay on the outer wall of the left ventricle was detected in the apical four-chamber view.

In conclusion, this study is characterized as a pilot study in a dog, but it provides valuable guidance about this little-known and not well defined cases' diagnosis in dogs.

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