BOXER CARDIOMYOPATHY

BASICS

OVERVIEW
• A familial cardiomyopathy of boxers characterized by ventricular and atrial arrhythmias, variable degrees of myocardial dysfunction, congestive heart failure, and sudden cardiac death
• The first manifestations of the disease are transient ventricular arrhythmias. As the disease progresses, myocardial dysfunction occurs in approximately 30-40% of cases.

SIGNALMENT
• occurs in all ages, most common in 4-8 year old boxers
• a genetic basis is very likely
• incidence is slightly higher in males

SIGNS AND SYMPTOMS

General
• Variable depending on stage and presence of myocardial dysfunction

Historical Findings
• In some boxers, the first sign of disease is sudden death
• There may be a history of syncope or collapse
• Relatives may be similarly affected

Physical Exam Findings
• An irregular cardiac rhythm may be present in advanced cases
• A systolic murmur is found in cases with mitral regurgitation and myocardial dysfunction

CAUSES & RISK FACTORS
• Unknown, genetic basis likely

DIAGNOSIS

DIFFERENTIAL DIAGNOSIS
• Other causes of episodic weakness or collapse (Addison’s disease, hypoglycemia)
• Dilated cardiomyopathy, viral myocarditis

LABORATORY TESTS
• CBC and profile are usually within normal limits

OTHER TESTS

Thoracic Radiographs
• The cardiac silhouette is within normal limits unless there is accompanying myocardial dysfunction

Echocardiography
• There are no structural abnormalities until late in the course of disease. When myocardial dysfunction occurs, there is left ventricular and left atrial dilatation and a decrease in fractional shortening.

Electrocardiogram
• May be within normal limits considering the transient arrhythmias typical of the disease. The hallmark is the occurrence of ventricular premature complexes with a left bundle branch block pattern.

Holter monitoring
Continuous ambulatory electrocardiography for 24 hours (Holter monitoring) is currently the most sensitive diagnostic tool. The presence of ventricular premature complexes and ventricular tachycardia are typical findings.

**TREATMENT PRINCIPLES**
- Patients with CHF should be hospitalized until stabilized
- Activity should be restricted if there is severe ventricular arrhythmia
- A low sodium diet is warranted if there are signs of congestive heart failure

**MEDITATIONS**

**DRUGS AND FLUIDS OF CHOICE**

- Antiarrhythmic therapy is indicated when significant ventricular ectopy is definitively documented – atenolol (Tenormin®) at a dose of 12.5 to 25 mg BID along with a class I antiarrhythmic (procainamide or mexilitine) are most commonly used.
- Diuretics are indicated when CHF is present. The aggressiveness of diuretic therapy is proportional to the degree of pulmonary edema (Lasix 1-2 mg/kg PO BID-QID).
- Vasodilators may be beneficial in reducing clinical signs (enalapril - 0.5mg PO SID-BID or benazepril 0.125 to 0.25 mg/kg SID).
- Supplementation with l-carnitine may be of benefit (1-3 gm daily) if there is myocardial dysfunction.

**CONTRAINDICATIONS/POSSIBLE INTERACTIONS**
- N/A

**FOLLOW-UP**
- Frequent rechecks of the electrocardiogram are warranted when significant ventricular ectopy is detected and antiarrhythmic therapy used.

**EXPECTED COURSE AND PROGNOSIS**
- Control of syncope is often achieved with the use of antiarrhythmic medications
- Sudden cardiac death secondary to ventricular arrhythmia is common
- Boxers not succumbing to sudden death may develop signs of dilated cardiomyopathy

**MISCELLANEOUS**

**ASSOCIATED CONDITIONS**
- There may be an increase in ventricular arrhythmia associated with whelping and estrus

**OWNER EDUCATION**
- Considering the familial nature, affected boxers should not be bred

**REFERENCE**

**AUTHOR**
- John-Karl Goodwin

**CONSULTING EDITOR**
- F. Smith and L. Tilley