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Case Report

# Atrial fibrillation management in a breeding stallion



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## KEYWORDS

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**Abstract** A 20-year-old warmblood breeding stallion presented to a University practice for semen collection and evaluation was incidentally diagnosed with atrial fibrillation (AF). Electrocardiogram recordings during breeding revealed inappropriately rapid tachycardia and occasional ventricular premature depolarizations/aberrant ventricular conduction. Transvenous electrical cardioversion was performed. After successful cardioversion the horse displayed supraventricular ectopy and atrial contractile dysfunction and was administered sotalol hydrochloride in an attempt to decrease the risk of AF recurrence. Supraventricular ectopy and echocardiographic evidence of atrial dysfunction gradually improved and normalized over 6 months. No direct adverse effects of the chronic anti-arrhythmic treatment were observed and libido and semen quality were unaffected. AF recurred 6 months after cardioversion and sotalol therapy was continued to control the ventricular ectopy/aberrant ventricular conduction during semen collection. Considerations regarding pathologic arrhythmias and inappropriately high heart rates in breeding stallions with AF may be similar to those in riding horses. Sotalol

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hydrochloride was a safe anti-arrhythmic drug in the management of this case.  
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### Abbreviations

AF	atrial fibrillation
Am	late-diastolic wall motion velocity
cTnI	cardiac troponin I
ECG	electrocardiogram
HR	heart rate
LA	left atrium
LA FAC	left atrial fractional area change
NSR	normal sinus rhythm
SVPD	supraventricular premature depolarization
TVEC	transvenous electrical cardioversion
VPD	ventricular premature depolarization

A 20-year-old warmblood breeding stallion, weighing 580 kg, was presented to the Reproduction Center of the Swiss Institute of Equine Medicine Avenches for semen collection and freezing. The horse was bright and alert and in good body condition. Heart rate (HR) was 36–40/minute and the rhythm was irregularly irregular. His peripheral pulses and heart sounds were variable in intensity. There were no audible heart murmurs and the remainder of the general physical examination was normal.

A resting electrocardiogram (ECG) using a digital telemetry unit<sup>d</sup> showed atrial fibrillation (AF). The cardiac rhythm was recorded during three separate semen collections on a dummy. The HR during mounting and ejaculation increased to a maximum of 269, 278 and 273/min (reference range 178 [152–228], median [minimum–maximum]) [1] in each of the collections (Fig. 1) and 2–7 QRS complexes with markedly abnormal configuration, diagnosed as ventricular premature depolarizations (VPDs) or aberrantly conducted beats, were detected (Fig. 2) in each of the recordings. The maximal HR was defined as the highest average value of 10 consecutive beats. Cardiac troponin I plasma concentration (cTnI)<sup>e</sup> was normal before, 6 h after and 24 h after breeding (0.01 ng/mL;

reference range 0–0.06) [2]. Semen analysis (median [minimum–maximum]) was performed on 33 different ejaculates and had a volume of 20 (10–47) mL, a concentration of 227 (85–335) × 10<sup>6</sup> spermatozooids (sp)/mL, a total sperm count of 4,420 (1,890–6,816) × 10<sup>9</sup> sp, a progressive motility of 80% (75–90) before freezing and 35% (20–36) after thawing, respectively. Due to the inappropriately high HR and the presence of occasional VPDs/aberrant conduction during breeding, treatment of AF by transvenous electrical cardioversion was elected.

Non-invasive oscillometric blood pressure measured<sup>f</sup> with a cuff centered over the coccygeal artery and uncorrected for height above heart base was normal (111/68 [86] mmHg; systolic/diastolic [mean] pressure, reference range 80–144/49–105 [60–116]) [3]. An echocardiogram<sup>g</sup> showed a subjectively enlarged and rounded left atrium. Two-dimensional linear and area measurements of the left atrium were above the upper reference ranges, when corrected for body weight [4]. All other cardiac dimensions and calculated indices were normal with the exception of indices of left atrial (LA) contraction (LA active fractional area change [active LA FAC] and late-diastolic wall motion velocity of the left ventricular free wall [A<sub>m</sub>]) that cannot be measured during AF (Table 1). Color flow Doppler interrogation demonstrated trivial tricuspid and aortic regurgitation that were considered likely unrelated to the AF. Transvenous electrical cardioversion (TVEC) was performed at the Clinic for Equine Internal Medicine, Vetsuisse Faculty, University of Zurich, following previously described protocols [5]. The horse converted to normal sinus rhythm after four electrical shocks at a final energy level of 175 J (total energy delivered 550 J). The stallion recovered uneventfully from general anesthesia. A 72-h continuous ECG performed after recovery from general anesthesia revealed occasional runs of atrial tachycardia/atrial flutter and frequent single supraventricular premature depolarizations (SVPDs). Echocardiography<sup>h</sup> 24 h and 72 h after

<sup>d</sup> Televet 100, KRUISE A/S 5290 Marslev, DK.

<sup>e</sup> iStat 1, Abbott Point of Care, Princeton NJ, USA.

<sup>f</sup> Lifepak 15 monitor/defibrillator, Physio-Control Switzerland Sales GmbH, Zug, CH.

<sup>g</sup> Vivid 7, GE Medical Systems (Schweiz) AG, Glattbrugg, CH.

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