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Case Report

Successful Non-fluoroscopic Radiofrequency Ablation of Incessant Atrial Tachycardia in a High Risk Twin Pregnancy

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Abstract

We describe a patient presenting with incessant ectopic atrial tachycardia during a high risk twin pregnancy. Tachycardia was resistant to escalating doses of beta-blockade with digoxin. Because of increasing left ventricular dysfunction early in the third trimester, catheter ablation was performed successfully at 30 weeks gestation. Electro-anatomic mapping permitted the entire procedure to be conducted without the use of ionizing radiation. The pregnancy proceeded to successful delivery near term and after three years the patient remains recurrence free with normal left ventricular function, off all medication.

Key Words: Ectopic atrial tachycardia, Tachycardia-cardiomyopathy, Twin pregnancy

Introduction

Arrhythmias may be facilitated in pregnancy by altered autonomic tone, neuro-hormonal effects and cardiac chamber stretch secondary to increased intravascular volume. They are usually self-limiting, and seldom pose a risk to maternal or fetal health. Treatment is generally conservative though pharmacological therapy is sometimes indicated on symptomatic and occasionally prognostic grounds. Incessant (usually modest) tachycardia may be misdiagnosed particularly during pregnancy when sinus tachycardia is common. Failure to recognise and treat incessant tachycardia may result in cardiomyopathy which in pregnancy is associated with poor fetal and maternal outcome. Ablation of drug-resistant arrhythmia has previously been described in singleton pregnancy. Non-fluoroscopic navigation systems have facilitated both the mapping of complex arrhythmias and ablations, and the reduction of exposure to ionising radiation. There are however no previous reports of catheter ablation performed in twin pregnancy.

Case

A 48 year old with multiple previous miscarriages secondary to thrombophilia and no previous successful pregnancy became pregnant with twins after repeated in-vitro fertilisation (IVF) cycles. The patient was noted to have an asymptomatic tachycardia and initially started on labetolol 100mg b.i.d. She was referred for assessment to the arrhythmia service. At 28

weeks' gestation mean heart rate was 151 beats per minute (bpm) (**Figure 1A**) but the patient remained asymptomatic.

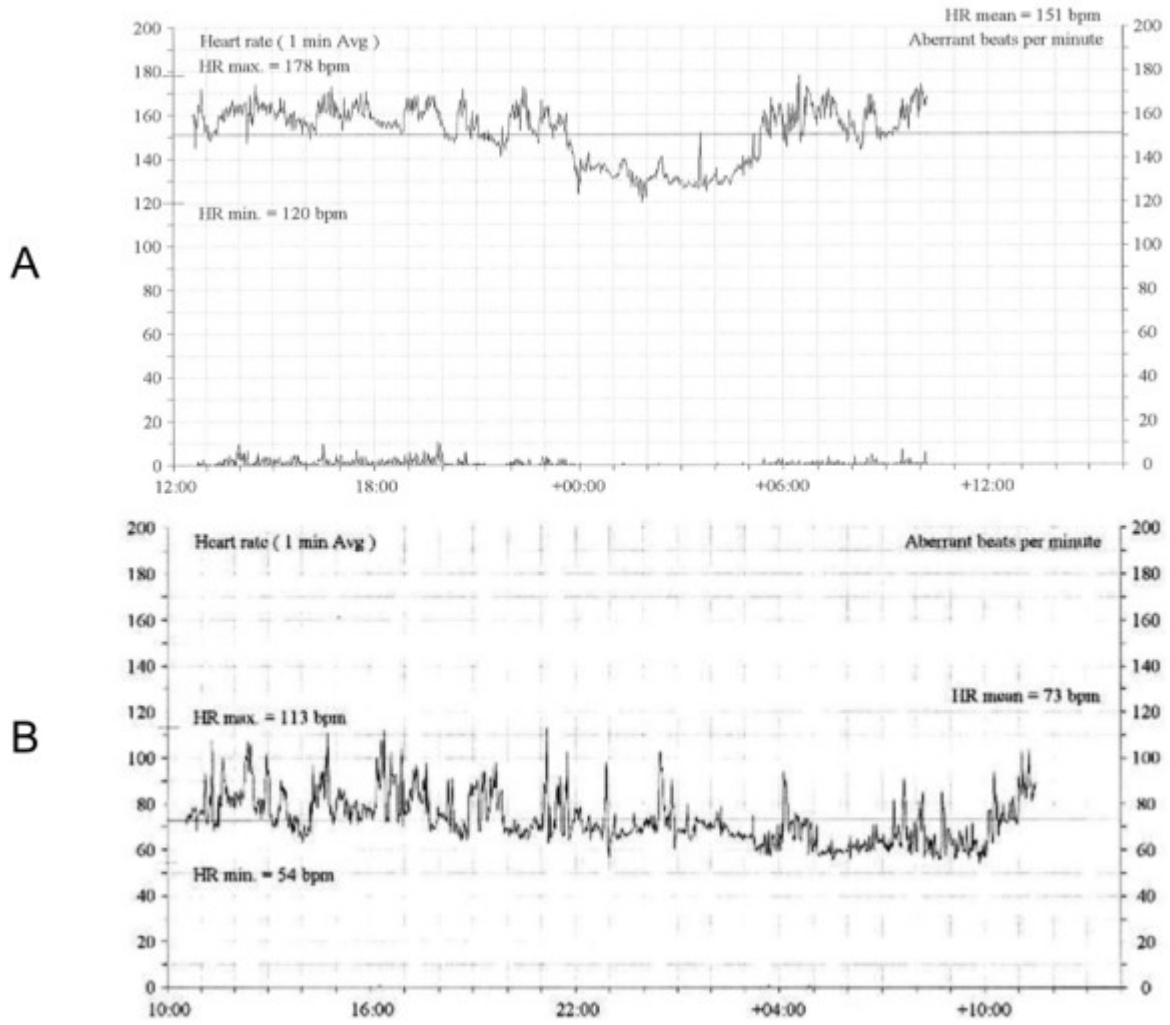

Figure 1. Mean heart rate tachograms recorded over a 24hr period pre (A) and post ablation (B).

A 6mg adenosine challenge with 12-lead ECG recording was performed (**Figure 2**). Adenosine transiently induced atrioventricular block followed by two sinus beats. This permitted characterisation of P-wave morphology (positive in aVL, negative in both V1 and inferior leads. P-waves were isoelectric or positive in the precordial leads) which was suggestive of a tricuspid annular or low right atrial focus.

Immediate resumption of the tachycardia indicated that cardioversion would not be clinically useful. Beta-blockade was escalated and digoxin added, but ventricular rate control remained poor and left ventricular function was clearly deteriorating. At 30 weeks' gestation, the mean ventricular rate was 126 bpm despite labetalol 300mg t.i.d. and digoxin 250mcg daily, and the left ventricular ejection fraction was 30%, indicating tachycardia-cardiomyopathy early in the third trimester, when hemodynamic demands increase greatly. Treatment options were discussed (early delivery by Caesarean section, further medical therapy or catheter ablation). Owing to anticipated further deterioration in LV function with progression of pregnancy the patient elected for catheter mapping and ablation at 30 weeks' gestation.

Venous access was gained via the right femoral vein under local anaesthesia. Owing to hemodynamic instability when supine due to IVC compression by the gravid uterus, the rest of the case was conducted with the patient in the left semi-decubitus position. Multipolar diagnostic and mapping catheters were advanced without fluoroscopy to the right atrium