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An Unusual Electrocardiogram in a Heart Transplant Recipient

To the Editor:

A 51-year-old man experienced a brief syncopal episode followed by persistent palpitation and lightheadedness. He had a significant medical history of heterotopic cardiac transplantation 19 years previously for advanced heart failure secondary to viral myocarditis. Plasma electrolytes were normal. A 12-lead electrocardiogram (ECG) (**Figure 1**) demonstrated a regular narrow-complex tachycardia (105 beats per minute) with incomplete right bundle branch block morphology clearly visible in the right precordial leads, marching through a haphazard coarse baseline, which predominated in the left precordial leads.

Bedside echocardiography revealed complete akinesia of both ventricles of the patient's native heart, with the aortic and pulmonary valves persistently closed. This confirmed that the ECG appearances represented the coexistence of ventricular fibrillation in the native heart and sinus rhythm in the transplanted heart. The patient became progressively hypotensive and developed symptoms and signs of pulmonary edema and was therefore urgently cardioverted with a 150 joule direct-current shock that was synchronized to the transplanted heart QRS complex. Restoration of sinus rhythm in the native heart was associated with a prompt resolution of symptoms and restoration of baseline ECG appearances (**Figure 2**). He was administered amiodarone as a secondary preventative measure and continues to do well.

Heart transplantation remains the gold standard treatment for selected patients with advanced heart failure. Orthotopic heart transplantation, whereby the native heart is excised and replaced with the donor heart, is the most commonly performed procedure. Heterotopic heart transplantation, whereby the donor heart is implanted alongside the native heart (usually in the right hemithorax) and shares the same arterial and venous connections in a "piggy-back" fashion, is a much-less-used technique. It was performed more frequently in the late 20th century when immunosuppression regimes and mechanical circulatory support programs were less well developed. There is a paucity of reports of native heart ventricular fibrillation in heterotopic heart transplant recipients, with widely varying degrees of hemodynamic compromise and management strategies.[1-4] Our case adds to the literature on the roles of synchronized DC

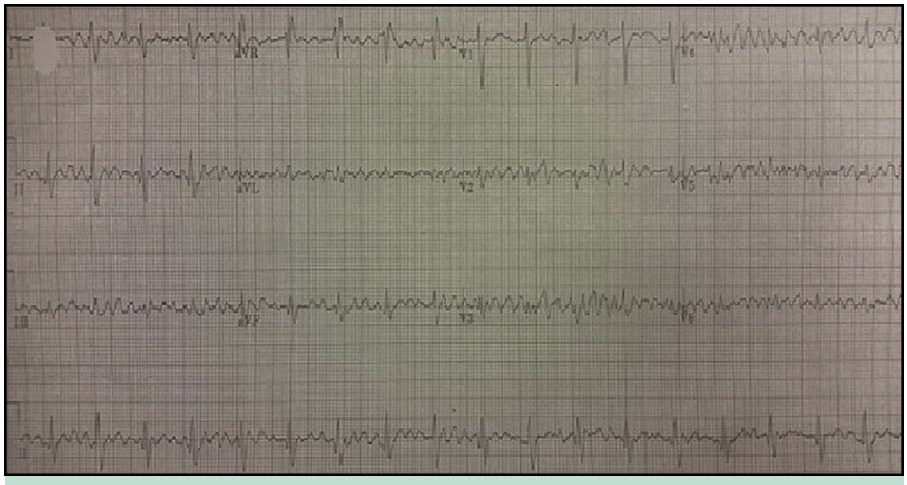

Figure 1 Twelve-lead electrocardiogram on admission. The heterotopic heart is situated in the right hemithorax, hence the sinus beats from the heterotopic heart are clearly visible in the right precordial leads (V1-2), whereas in the left precordial leads (V5-6) ventricular fibrillation is more clearly seen because these overlie the native heart.

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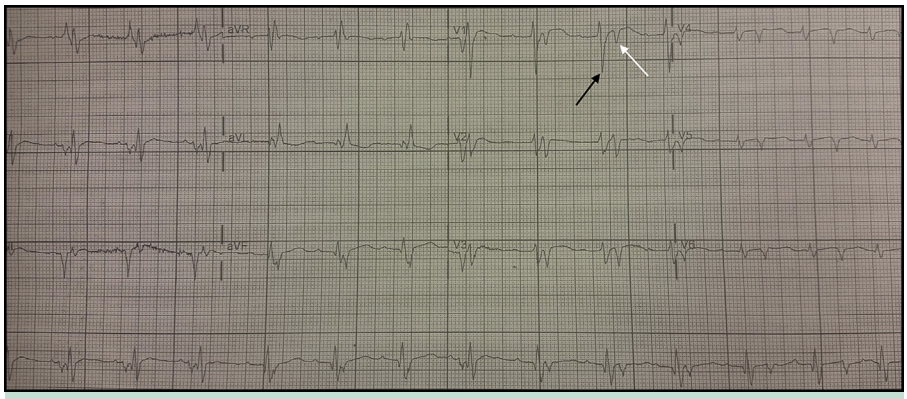

Figure 2 Twelve-lead electrocardiogram after direct-current cardioversion. Two regular narrow-complex QRS complexes of contrasting morphologies are now seen, representing the patient's native (white arrow) and heterotopic heart (black arrow).

cardioversion as an effective immediate therapy and amiodarone as a secondary preventative measure for a rare but serious problem.

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