

A Sudden Transformation

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The ECG shown in Figure 1 was recorded in a 37-year-old woman at the time of outpatient assessment in a cardiology clinic. Two months later, a repeat ECG (Figure 2) is obtained.

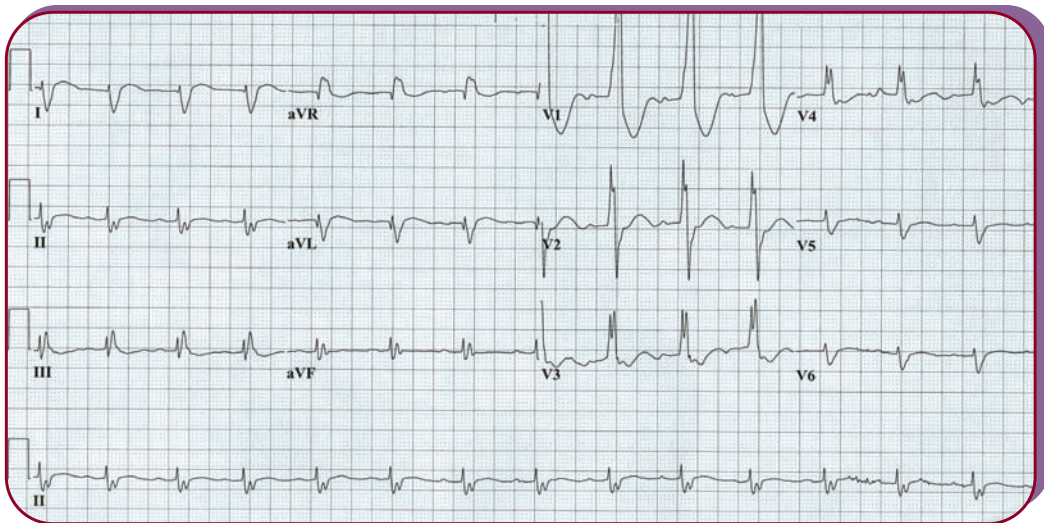


Figure 1. ECG upon presentation.

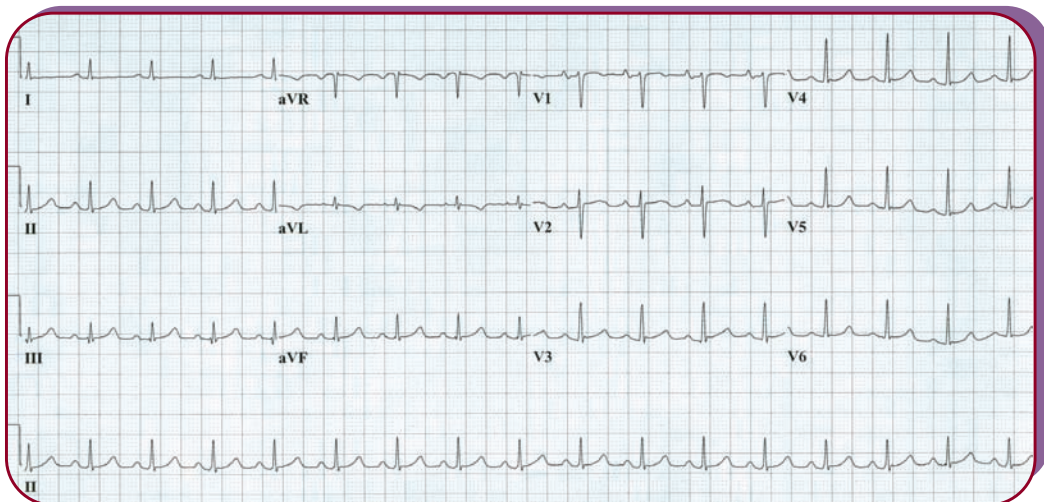


Figure 2. ECG two months later.


- 1. What abnormalities are shown and what is the most likely cardiac diagnosis?*
- 2. What is the explanation for the dramatic change in her ECG?*

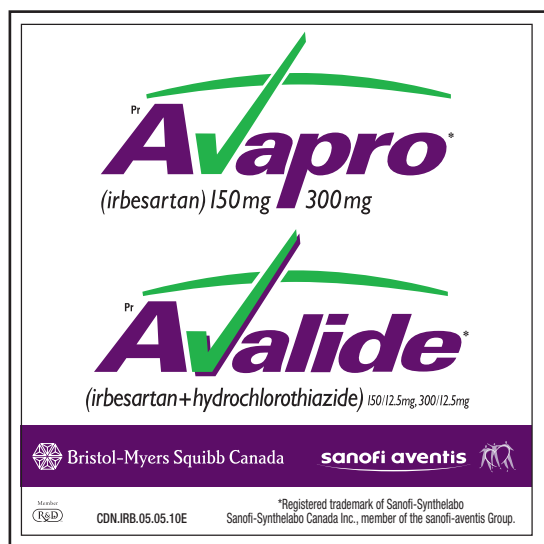
This Month's ECG Diagnosis

1. The initial ECG shows sinus rhythm at a rate of 85 beats per minutes. There is marked rightward deviation of the QRS axis (+156 degrees) in the frontal plane. The precordial leads show an atypical right bundle branch block (RBBB) pattern, with unusually large R waves of approximately 30 mm in lead V1. Although the diagnosis of right ventricular hypertrophy (RVH) can be tricky in the presence of RBBB, an R' wave taller than 10 mm to 12 mm, in combination with other features suggestive of RVH (*i.e.*, abnormal right axis deviation, right atrial enlargement), is usually considered diagnostic. A single very tall R wave in V1 with an RBBB-like QRS configuration is often seen in patients with severe RVH due to longstanding RV pressure overload.

In this patient, the magnitude and duration of the R wave in V1, along with marked right axis deviation, indicate severe RVH due to chronically elevated right ventricular systolic pressures. The patient has transposition of the great arteries and she underwent a Mustard procedure in early childhood. In this condition, the right ventricle becomes the systemic ventricle and appropriateness of pulmonary and systemic venous return is restored by the Mustard atrial "baffle," which directs pulmonary venous blood through the tricuspid valve and into the right (systemic) ventricle. A similar ECG may be seen in patients with Eisenmenger syndrome.

2. The appearance of a now normal ECG (Figure 2) in this patient is unexpected. The most likely explanation was that it was another patient's ECG which was inadvertently mislabelled, but this was not the case. The changes of severe, longstanding RVH are unlikely to regress spontaneously, particularly in such a short time frame. This patient had undergone a heart transplant

procedure between the two ECGs and the second ECG reflects the electrical activity of the new donor heart. The presence of two separate and unrelated atrial rhythms (the atrial remnant in the recipient heart may continue to beat independently) can be a clue to the presence of a cardiac transplant, but is not invariable and was not seen here. 



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