



ECG of the Month

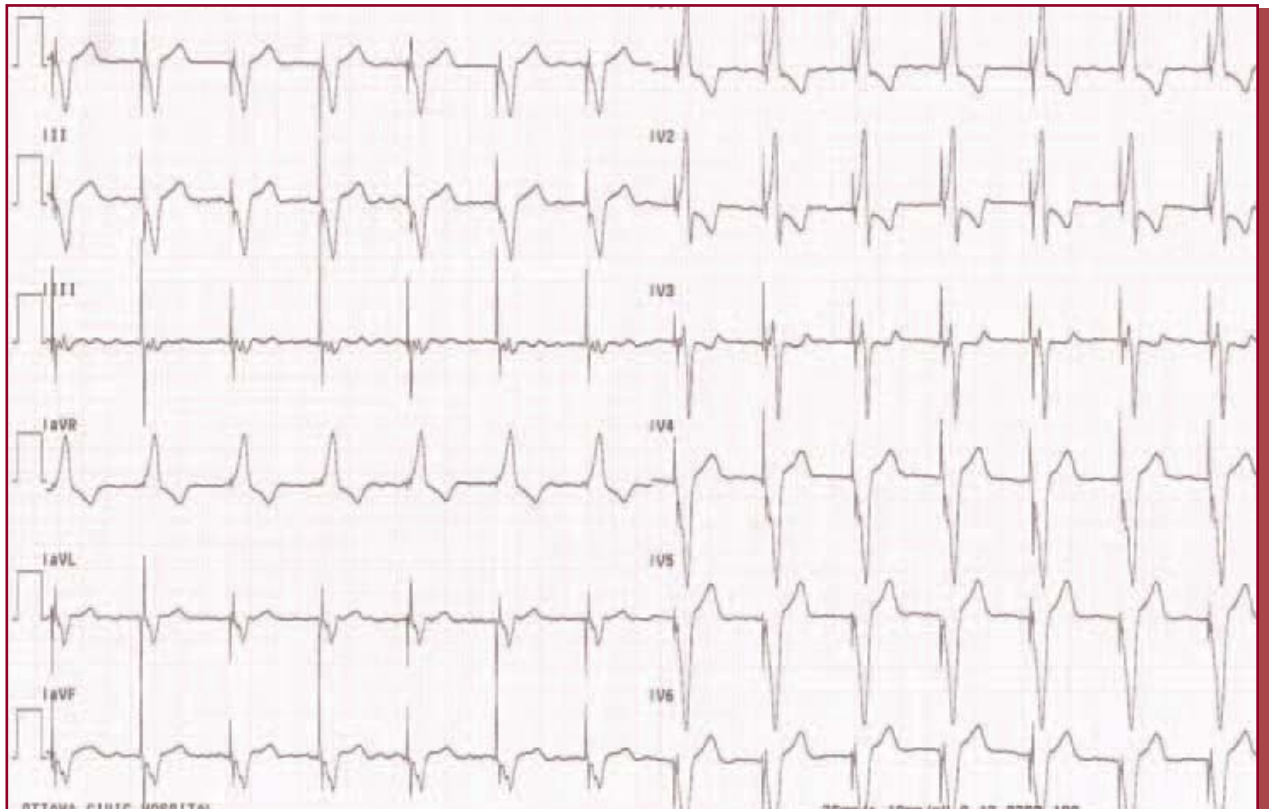
University of
Ottawa Heart Institute

By Martin S. Green, MD, FRCPC

Left to Right

This ECG was recorded from a 72-year-old man with congestive heart failure following a pacemaker implantation.

What is the diagnosis? _____



This Month's ECG Diagnosis

This ECG shows a paced ventricular rhythm at a rate of 70 beats per minute (bpm). The paced complex has a right bundle branch block (RBBB) morphology. The atrial rhythm appears to be irregular with no discrete P-waves, suggesting atrial fibrillation (AF).

The paced beats appear to have a RBBB-like morphology. Typically, pacemakers pace the right ventricular apex and, as such, the right ventricle is activated first and the left ventricle is activated last. Typically, paced morphology is left bundle branch block (LBBB) morphology. In this case, the fact that the paced morphology is RBBB-like morphology suggests that there is relatively earlier activation of the left ventricle and delayed activation of portions of the right ventricle.

This patient had AF and complete heart block with a wide LBBB morphology and congestive heart failure prior to pacemaker implantation. The patient, therefore, received biventricular pacing, with a typical pacemaker lead in the right ventricular apex and a second pacemaker lead via the coronary venous system to pace the epicardial surface of the left ventricle. Biventricular pacing has been shown to be very effective in the management

of symptoms of congestive heart failure in patients with very wide QRS morphology and severe heart failure.

Typically, when one sees a paced rhythm with a RBBB-like morphology, one should consider left ventricular pacing through an atrial septal defect or via the coronary sinus. In rare times, it can be done through the arterial system as well. When,

as in this case, the goal is to pace the epicardial surface of the left ventricle via the coronary venous system, the paced QRS complex may show either a narrower QRS or a QRS that suggests more of a RBBB morphology. Another cause of a paced QRS with RBBB morphology is pseudofusion, with the pac-

ing stimulus occurring simultaneously with a QRS conducted with RBBB. This usually occurs with dual chamber pacing and atrial tracking of sinus rhythm, such that the triggered ventricular pacing is occurring at the same time as AV conduction. This is not the case here, as the atrial rhythm is AF and conduction would not be expected to be regular.

The patient was clinically improved following biventricular pacing and was discharged uneventfully and feeling better. 