Bigeminal rhythm IX

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Figure. Electrocardiogram recorded 4 days after biventricular pacemaker implantation. See text for explication.

A 49-year-old hypertensive woman with cardiac failure, due to a nonischemic cardiomyopathy with a left ventricular ejection fraction of 35%, had normal sinus rhythm and left bundle branch block with a QRS duration of 148 milliseconds on her electrocardiogram. She received a biventricular pacemaker that initially functioned normally in the A-V synchronous mode with a P-R interval of 100 milliseconds. Four days later at a sinus rate of 100 beats/minute, alternate P waves were followed by an electronic biventricular pacemaker-initiated QRS and by a QRS with a left bundle branch block configuration in the absence of a pacemaker spike (*Figure*); i.e., the pacemaker failed to pace after alternate P waves.

The pacemaker had functioned normally at a rate of 118 P waves per minute, so an atrial rate exceeding the pacemaker's programmed upper rate limit was not the problem. Instead, the problem was oversensing. The postventricular refractory period of the paced complexes was too short, allowing the pacemaker

to sense the T wave of the pacer-induced complex as an R wave (interpreted by the pacemaker as a PVC). This caused the pacemaker to be reset and allowed the next sinus P wave to be conducted with the T wave of the native beat not sensed, an unusual cause of a bigeminal rhythm (1). The problem was solved by lengthening the postventricular refractory period of the paced complexes.

1. Gering LE. Artificial electronic pacemakers. In Surawicz B, Knilans TK. *Chou's Electrocardiography in Clinical Practice, Adult and Pediatric* (5th ed). Philadelphia: W. B. Saunders, 2001:583–613.

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