Case presentation

A 76-year-old male patient was admitted to the emergency room for dyspnoea, cyanosis and chest discomfort. Dilated cardiomyopathy was diagnosed many years ago, with permanent atrial fibrillation and a very slow ventricular response necessitating pacemaker implantation in 1993. In 2005, an upgrade to biventricular pacing was performed with improvement in functional status and ejection fraction. Medical treatment included acenocoumarol, spironolactone 12.5 mg per day, enalapril 5 mg twice daily, and furosemide 40 mg per day.

On admission, blood pressure was 90/60 mm Hg, pulse was irregular at a rate of 60 bpm, temperature was 38.1 degrees. Marked orthopnea with cyanosis was present, bilateral rales were present during pulmonary auscultation and peripheral oedema were obvious. A 12-lead resting ECG was performed on admission (fig. 1).

Questions

1. Is the pacemaker functioning?
2. How can you describe the rhythm?
3. What will you do in the emergency room?

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Commentary

ECG modifications related to hyperkaliaemia are known for decades and include tall, peak and symmetrical T waves, conduction disturbances (atrioventricular block, bundle branch block, nonspecific intraventricular conduction delays with very broad and funny QRS complexes) and lethal arrhythmias (ventricular tachycardia, ventricular fibrillation, extreme bradycardia, asystole...) [1]. ECG abnormalities may occur when the potassium level is above 5.0 mmol/l, but are essentially observed when the level is above 6.0 mmol/l. Failure to sense and failure to capture may be observed in patients with permanent pacemakers like in the present report [2–4].

In conclusion, hyperkaliaemia should be immediately suspected in the presence of a very broad and funny QRS complex, and when pacemaker dysfunction occurs in a previously stable patient.

References