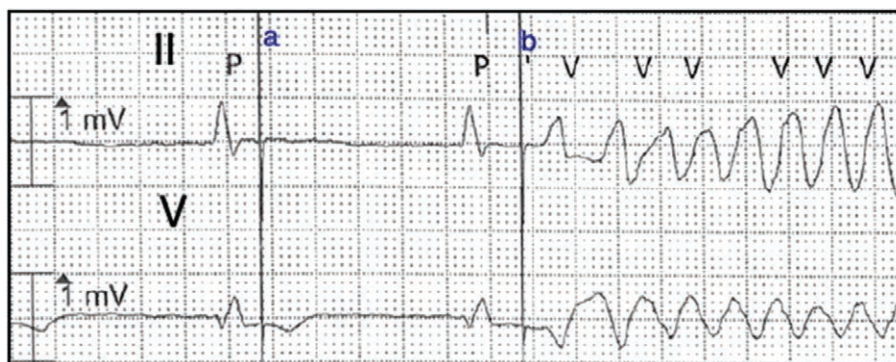


Sustained Ventricular Tachycardia Secondary to R-on-T Phenomenon Caused by Temporary Ventricular Epicardial Pacemaker Undersensing after Cardiac Surgery

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R-on-T phenomenon is a ventricular extrasystole caused by a ventricular depolarization superimposing on the previous beat's repolarization.¹ Although rare, this can result in ventricular arrhythmias, which can lead to cardiac arrest. In patients with pacemakers, R-on-T phenomenon can have multiple causes, including pacemaker undersensing.^{2,3} The image presented here is taken from telemetry in the intensive care unit, a few days after cardiac surgery. The image shows two inappropriate ventricular pacing spikes falling on the T wave; the first is labeled "a" and the second is labeled "b." Pacing spike *a* falls on a T wave followed by an intrinsic QRS complex. After pacing spike *b* falls on a T wave, polymorphic ventricular tachycardia is seen in leads II and V. After cardiopulmonary resuscitation and defibrillation, a perfusing rhythm was resumed. In patients with temporary epicardial pacemakers placed during surgery, inappropriate pacing spikes seen in the perioperative period are often attributable to pacemaker undersensing.³ Inappropriate ventricular pacing spikes appear on telemetry or electrocardiogram monitors after the end of the QRS complex and before the end of the T wave and may be accompanied by a loss of perfusing rhythm. Regardless of the patient's clinical location, the pacemaker rate can be increased above the intrinsic heart rate; this suppresses the intrinsic rhythm, eliminating the possibility of inappropriate pacing resulting in R-on-T phenomenon. Alternatively, if the patient is not dependent on ventricular pacing for

a perfusing rhythm, the lead(s) can be disconnected while troubleshooting the pacemaker. Once the anesthesiologist has stopped the inappropriate pacing, they can decrease the set output to the lowest value at which a pacemaker beat causes cardiac electrical capture and then increase the set sensitivity until pacing spikes are inhibited by intrinsic QRS complexes.¹⁻³

Competing Interests

The authors declare no competing interests.

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