

Is a pacemaker implantation warranted in this patient?

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Internal loop recorders (ILRs) are frequently implanted in patients with syncope or paroxysmal tachycardias. Built-in auto-activation algorithms are not perfect, but have much improved in the newer, smaller devices. We report a case of a 64-year-old patient with recurrent syncope and ILR which detected an atrioventricular block III° while the patient was asymptomatic. Would you proceed with pacemaker implantation?

A 64-year-old patient was scheduled for implantation of an internal loop recorder (ILR) due to recurrent syncopes. The patient did not take any medication.

Two months after implantation of a Medtronic Linq[®], an asystole >5 s occurring at 10:45 a.m. (Figure 1) was transmitted by remote telemonitoring (CareLink[®]) and at the first glance was interpreted as atrioventricular (AV) block. The patient was contacted by phone and did not recall any symptoms at the time of the stored arrhythmia. Would you put a pacemaker in this patient with recurrent syncope and this ECG?

Since the Medtronic Reveal Plus[®] ILR, these devices have the capability of auto-activation if an arrhythmia is detected. Previous studies of Ng *et al.* reported a high incidence of inappropriate auto-activations (83%) in 50 consecutive patients implanted with these devices,¹ and undersensing is a major issue.² In spite of many technical improvements since, a persistent problem, documented by several case reports,^{1,3} remains false asystole detection. Undersensing of QRS complexes might result from an abrupt decrease in the recorded QRS amplitude or a transient loss of signal and baseline drift probably caused by electrostatic discharge saturating the device's amplifier.² Furthermore, false asystole detection occurs frequently in the early postoperative phase because of a high contact impedance (loose interface-contact) between the electrode(s) and the tissue.^{1,3} Maturation of the device–tissue interface should provide optimal contact and proper sensing, and creating a tight device pocket may help to minimize this problem.³ Another reason for false asystole detection is electromagnetic interference such as magnetic resonance imaging, antitheft surveillance systems, media players, or shock wave therapy.³

In the Medtronic Reveal LINQ ILR, inappropriate asystole detection is expected to be minimized since surface structure of the electrode improved and the subcutaneous injection technique leads to a tighter tissue contact of the device. In line with this hypothesis, no case report of false asystole detection in a Reveal LINQ has been published until today.

In our patient, close examination of the transmitted rhythm strip and clinical background information revealed inappropriate AV block detection rather than true asystole. Several facts support our hypothesis (Figure 1). First, the RR interval is exactly the same between

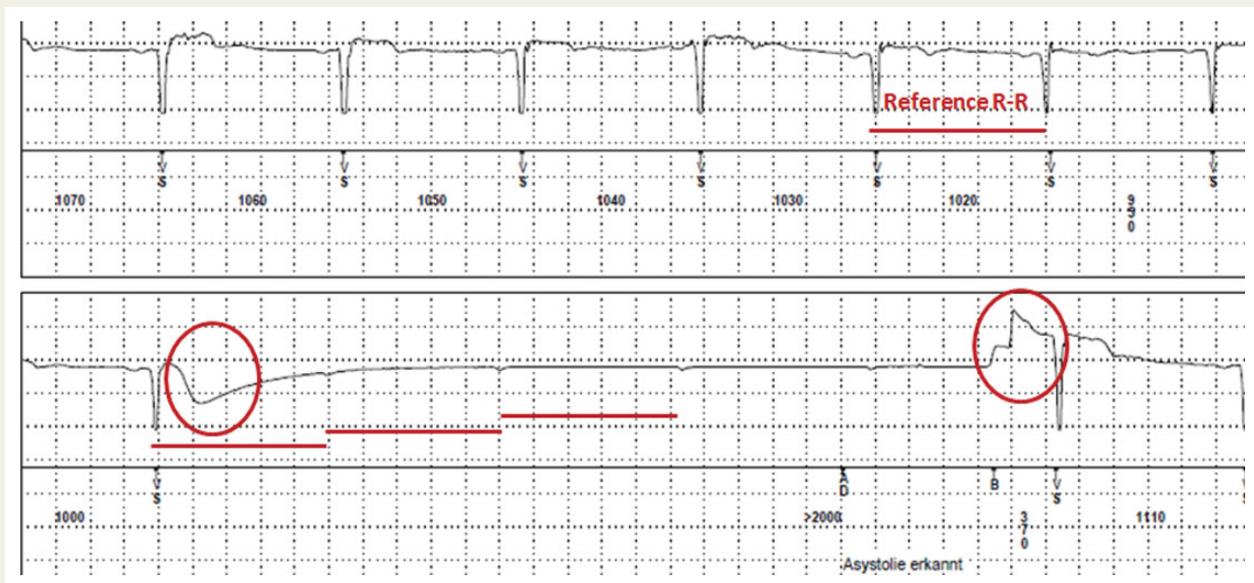


Figure 1 Normal AV sequential rhythm with abrupt reduction in signal amplitude, most likely due to very high electrode–tissue impedance. The RR intervals (bars) remain constant throughout the rhythm strip suggesting the low voltage deflections during detected asystole being R waves rather than P waves. The baseline jump at the episode start and end (circled) suggests an abrupt change in electrode–tissue impedance.

normal appearing QRS complexes and the complexes with abruptly reduced signal amplitude, suggesting an abrupt rise in electrode–tissue impedance, almost creating a loss of contact situation. In new ILR, excellent signal quality often allows detection of a P wave, and the abrupt decrease in R wave amplitude may simulate an ongoing P wave suggestive of AV block. However, in an adult without rate slowing medication, acceleration of the PP intervals would be suspected if a real AV block was present. Furthermore, like in Reveal DX/XT, the baseline jump at the beginning and the end of the episode is offset due to voltage variation.³ Finally, the patient was completely asymptomatic during this episode.

Despite a history of unexplained syncope and the suggestion of an AV block at the first glance, an implantation of a pacemaker in our patient would have been inappropriate. Nevertheless, a remote monitoring might be advantageous and reassuring in this situation.

Conflict of interest: none declared.

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