Case Report

Inappropriate Asystole Detection in Early Postoperative Phase after Loop Recorder Implantation

Miriam Bortnik, Eraldo Occhetta, Andrea Magnani, Anna Degiovanni, and Paolo Marino

Cardiology Division, Azienda Ospedaliera Maggiore della Carità, 28100 Novara, Italy

Correspondence should be addressed to Miriam Bortnik, miriam.bortnik@libero.it

Received 18 February 2011; Accepted 8 April 2011

Academic Editor: J. S. Steinberg

The implantable loop recorder is considered nowadays a powerful tool for the investigation of unexplained syncope and for transient events that suggest cardiac arrhythmias [1, 2]. The first generation of these devices (Medtronic Reveal 9525, Minneapolis, Minn, USA) was only capable of making patient-initiated recording by means of an external, hand-held device (Patient Activator); the following generations (Reveal Plus 9526, Reveal DX 9528 and Reveal XT 9529) have also the capability to automatically detect and record arrhythmic events. The role of new automatic detection algorithms in improving the diagnostic utility of ILRs is still not well established [3]. We herein report the case of a patient in which several inappropriate activations of long-lasting asystole occurred in the two days following the implant, probably because of an intermittently loose contact between the device and subcutaneous tissue for a small pocket haematoma.

1. Introduction

The implantable loop recorder (ILR) is considered nowadays a powerful tool for the investigation of unexplained syncope and for transient events that suggest cardiac arrhythmias [1, 2]. The first generation of these devices (Medtronic Reveal 9525, Minneapolis, Minn, USA) was only capable of making patient-initiated recording by means of an external, hand-held device (Patient Activator); the following generations (Reveal Plus 9526, Reveal DX 9528 and Reveal XT 9529) have also the capability to automatically detect and record arrhythmic events. The role of new automatic detection algorithms in improving the diagnostic utility of ILRs is still not well established [3]. We herein report the case of a patient in which 19 episodes of inappropriate detection of long-lasting asystole were recorded in the two days following ILR implantation; we hypothesize that this phenomenon was related to transitory signal loss because of imperfect device contact with the subcutaneous tissue probably due to small pocket haematoma.

2. Case Report

A 74-year-old female patient was admitted to our Cardiology Department because of several episodes of dizziness and syncope. She had a history of hypertension and was receiving ACE-inhibitor. ECG on admission showed sinus bradycardia with a phase of junctional rhythm. An extensive cardiological investigation which included echocardiography, 24 hours Holter monitoring, Tilt test, and invasive electrophysiological study could not establish an aetiology. An ILR (Reveal DX model 9528) was implanted. The device was inserted into subcutaneous tissue of the left pectoral region; intra-operative real-time electrocardiographic telemetry showed reliable R wave sensing. The patient was discharged from hospital the following day; the device pocket appeared to be in good conditions. At the scheduled followup, three months after ILR implant, the patient was asymptomatic with no clinical events reported; at telemetry interrogation, 30 episodes of auto-activation, all inappropriate, have been stored. In 19 episodes, long phases of false asystole detection (up to 140 seconds of maximal duration) were related to signal loss artefact (Figure 1(a)). It is noteworthy that all these episodes of inappropriate prolonged asystolic pauses detection had been recorded during the first two days after the device implant and no more recorded subsequently. In 2 cases, inappropriate activation, which was recorded one month after ILR implant, was related to false asystole detection for brief undersensing of ECG signal amplitude (Figure 1(b)). In the remaining 9 events, recorded beginning...
from three days after the implant, inappropriate activation was due to false fast ventricular tachycardia detection related to noises (Figure 2). We have hypothesized that, in our patient, prolonged inappropriate autodetections of asystole in the early postoperative period were related to transitory signal loss because of suboptimal device contact with the subcutaneous tissue, probably due to a small swelling for a minimal pocket haematoma which rapidly subsided preventing further inappropriate detections with these characteristics. On the contrary, the following inappropriate autoactivations for undersensing of R wave or oversensing of noise signal artefact recorded in our patient represent a quite common phenomenon which, in our case, occurred despite the implemented new sensing and detection scheme.

3. Discussion

The ILR is considered a valuable tool in patients with recurrent unexplained syncope following a negative baseline workup. The more recently developed versions of this device include an autoactivation function to supplement patient
activation. It has been designed to capture asymptomatic arrhythmic events or symptomatic events missed by manual activation. Unfortunately, the ILRs may be subject to interarrhythmic events or symptomatic events missed by manual activation. It has been designed to capture asymptomatic ISRN Cardiology 3 episodes; significant telemetry interferences have been observed also with cellular telephone [6] and more recently with a media player [7]. ILR correct functioning have been observed also with cellular telephone [6] and manual activation. It has been designed to capture asymptomatic oversensing related to T wave and myopotentials [8]. A previous study of Ng et al. [3], reported a very high incidence of inappropriate auto-activations (83%) in 50 consecutive patients implanted with Reveal Plus 9526. In the last ILR generation, automatic detection algorithms have been demonstrated a decrease of inappropriate detections with only 8% in 30 autodetection events were inappropriate with a subsequent risk or relevant appropriate autoactivation episodes being erased. In our case, the majority of inappropriate autodetections has been recorded within two days since ILR implant and were related to signal loss probably because of a intermittently loose contact between the device and the subcutaneous tissue. This is a rather common phenomenon and is the reason why intrathoracic fluids accumulation monitoring (Optivol Fluid Status Monitoring) integrated in some implantable biventricular defibrillators manufactured by Medtronic is automatically initialized about a month after the implant [10]. The high prevalence of inappropriate auto-detection seems to limit the precocious reliability of this function in our patient; an eventual symptom-rhythm correlation using standard patient activation could be probably more useful, at least in this subject. Besides, probably in patients implanted with ILRs, an additional early device interrogation one week after the implant could be useful to recognize this type of troubleshooting and to avoid device consequent memory saturation.

References


