

HOSTED BY



ELSEVIER

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/IPEJ

Atrial sensor, remote monitoring and new anticoagulant drugs: Identification and treatment of a patient with unknown and asymptomatic atrial flutter

Fabio Quartieri ^a, Daniele Giacomelli ^{b,*}, Matteo Iori ^a, Nicola Bottoni ^a

^a Cardiologia Interventistica, Arcispedale Santa Maria Nuova, Reggio Emilia RE, Italy

^b Biotronik Italia, Milano, Italy

ARTICLE INFO

Article history:

Available online 22 October 2015

Keywords:

Remote monitoring
Implantable cardioverter defibrillator

Atrial dipole

Atrial flutter

Anticoagulant drugs

ABSTRACT

This case report describes how new tools and technologies can drive a different approach in the management of arrhythmic patients. An unknown and asymptomatic atrial flutter was detected by the atrial sensor mounted in a single lead implantable cardioverter defibrillator. Moreover daily remote monitoring of the device allowed early notification and prompt clinical reaction. Anticoagulant therapy onset, radiofrequency ablation and the following anticoagulant therapy removal were driven by the device data transmissions.

Copyright © 2015, Indian Heart Rhythm Society. Production and hosting by Elsevier B.V.

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Different new technologies have become available in the recent years in the cardiac rhythm disease management. Atrial sensor in single lead implantable cardioverter defibrillator (ICD) and daily remote monitoring are examples of these innovations. New tools and technologies can drive a different approach in the management of patients, with efficiency improvements and better patient's outcome.

Case report

A 60-years-old man with ischemic cardiomyopathy (LVEF = 25%) and two previous coronary artery bypass underwent single-lead ICD (Iforia 5 DX, Biotronik SE & Co. KG, Berlin, Germany) implantation for primary prevention of sudden death in April 2014. The DX ICD is able of atrial sensing by the presence of a floating dipole mounted 150 mm from the tip and it is equipped with a daily remote monitoring system (Home Monitoring™, Biotronik SE & Co. KG, Berlin, Germany). At the time of the implantation the patient had no history of atrial arrhythmias.

Abbreviations: ICD, implantable cardioverter defibrillator; IEGM, intracardiac electrogram; HM, Home Monitoring™; AFL, atrial flutter.

* Corresponding author. Via delle Industrie 11, 20090 Vimodrone, MI, Italy. Tel.: +39 3491712305.

E-mail address: daniele.giacopelli@biotronik.com (D. Giacomelli).

Peer review under responsibility of Indian Heart Rhythm Society.

<http://dx.doi.org/10.1016/j.ipej.2015.10.001>

0972-6292/Copyright © 2015, Indian Heart Rhythm Society. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

In July 2014 a Home Monitoring™ (HM) alert of “atrial monitoring episode detected” (longer than 8 h) was received: the message arrived through fax during the night in the cure centre. The day after we contacted the patient; he was completely asymptomatic. The supraventricular arrhythmia had a low ventricular response, the mean heart rate was 83 bpm. We introduced in the patient's therapy a new oral anti-coagulant drug (apixaban) because he had CHA2DS-VASc score of 3. In the following days the persistence of the atrial arrhythmia was confirmed by the intracardiac electrogram (IEGM) daily sent by the HM (Fig. 1). We had a defined quantification of the arrhythmia with the daily atrial burden value (percentage of the time in atrial arrhythmia).

The patient was scheduled for the ablation procedure that was performed in September 2014. The synchronized atrial arrhythmia documented by HM was a typical atrial flutter (AFL), that was successfully ablated without any complications. In the following days the maintenance of the sinus rhythm was monitored: no arrhythmic alerts were received and the atrial burden was permanently 0%, as shown in Fig. 1.

In October 2014 at the follow up visit, after one month from the ablation, we removed the oral anticoagulant drug in the patient's therapy; this decision was driven by the fact that any possible new arrhythmic episode would be notified in the cure centre with a HM alert.

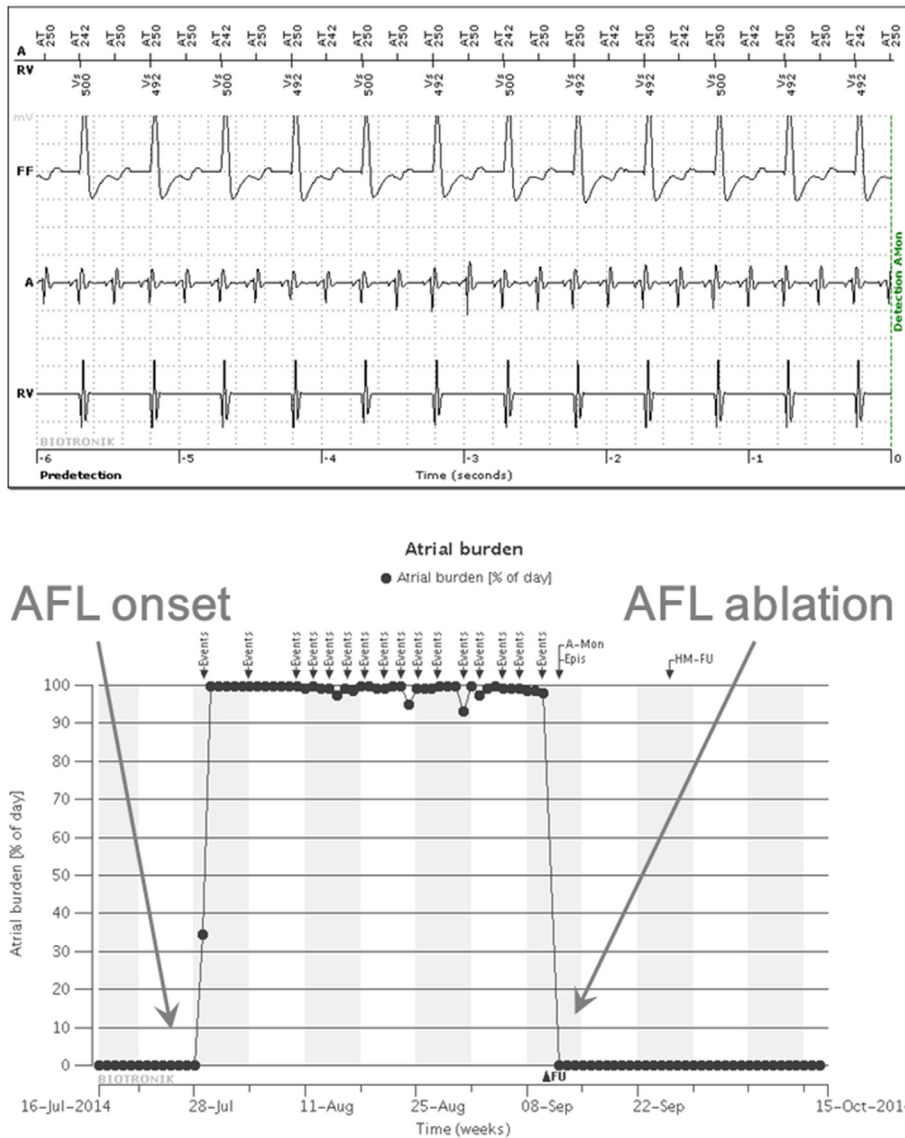


Fig. 1 – In the first panel the daily HM snapshot showing the atrial arrhythmia detected. IEGMs: first line, atrial and right ventricular annotation; second line, right ventricular farfield signal; third line, atrial signal from the floating dipole; fourth line, right ventricular signal; last line, time in seconds. IEGM = intracardiac electrogram. In the second panel the HM atrial burden graph; each black dot represents the daily percentage of time in atrial flutter (AFL). The onset of the arrhythmia was in July 2014. In September 2014 a ablation procedure was performed, the maintenance of the sinus rhythm were daily checked in the following days.

Discussion

This case reports an early detection of asymptomatic atrial arrhythmia with consequent clinical interventions for its optimal management. This has been possible thanks to the concomitant utilization of two technologies: the atrial sensing in a single-lead ICD and the daily remote monitoring of the device.

An usual single-chamber ICD would not have been able to detect this arrhythmia due to its low ventricular response, exactly as the patient had not been able for its asymptomatic nature. The DX ICD with floating atrial dipole has been proven to provide reliable atrial sensing [1] without the need to insert a second electrode which carries in itself a significant associated risk and expense.

There is a substantial incidence of subclinical atrial tachyarrhythmias which are a leading preventable cause of recurrent stroke [2]. Therefore we consider crucial having this information from an implanted device. The data become meaningful if they are early available for the physician to prevent arrhythmia-related severe adverse events. Without remote monitoring any information is available only during in-hospital follow-up, usually scheduled every 6 or 12 months, significantly delaying any clinical reaction. In this case we had the opportunity to contact the patient the day after the arrhythmia occurrence and to have prompt reaction in terms of drugs therapy modification that may have avoided major clinical adverse events. Early detection of atrial arrhythmia and prompt patient management may theoretically prevent stroke [3,4]; however clinical evidence for stroke risk reduction by remote monitoring is still awaited. This case is also an example of HM clinical practice: in our centre there is a reference nurse for the transmissions who filters the significant notifications for the expert physicians. When an organizational model is implemented, the HM has been also demonstrated to safely reduce healthcare source consumption, in terms of patient visits, time required for patient follow-up, physician time, costs of patient transport, and

hospital incurred costs [5]. We managed this patient remotely; just one ambulatory visit was performed one month after the ablation procedure. In this occasion the choice of interrupting the anticoagulant therapy was taken thanks to the HM presence. Nowadays telemedicine should be used in the management of arrhythmic patients [6] and it may guide in some cases, as in the one here presented, the clinical decisions.

Conflict of interest

Daniele Giacomelli is an employee of Biotronik Italia.

REFERENCES

- [1] Iori M, Giacomelli D, Quartieri F, Bottoni N, Manari A. Implantable cardioverter defibrillator system with floating atrial sensing dipole: a single-center experience. *Pacing Clin Electrophysiol* 2014;37:1265–73.
- [2] Healey JS, Connolly SJ, Gold MR, Israel CW, Van Gelder IC, Capucci A, et al. Subclinical atrial fibrillation and the risk of stroke. *N Engl J Med* 2012;366:120–9.
- [3] Ricci RP, Morichelli L, Gargaro A, Laudadio MT, Santini M. Home monitoring in patients with implantable cardiac devices: is there a potential reduction of stroke risk? results from a computer model tested through monte carlo simulations. *J Cardiovasc Electrophysiol* 2009;20:1244–51.
- [4] Mabo P, Victor F, Bazin P, Ahres S, Babuty D, Da Costa A, et al. A randomized trial of long-term remote monitoring of pacemaker recipients (The COMPAS trial). *Eur Heart J* 2012;33:1105–11.
- [5] Ricci RP, Morichelli L, D'Onofrio A, Calò L, Vaccari D, Zanutto G, et al. Manpower and outpatient clinic workload for remote monitoring of patients with cardiac implantable electronic devices: data from the HomeGuide registry. *J Cardiovasc Electrophysiol* 2014;25:1216–23.
- [6] Hindricks G, Taborsky M, Glikson M, Heinrich U, Schumacher B, Katz A, et al. Implant-based multiparameter telemonitoring of patients with heart failure (IN-TIME): a randomised controlled trial. *Lancet* 2014;384:583–90.