

Giant right atrial thrombus associated with ICD lead externalized conductors: a case report

Jean-Benoît le Polain de Waroux*, Christophe Scavée, and Sébastien Marchandise

Division of Cardiology, Cliniques Universitaires Saint-Luc, Université catholique de Louvain, Av. Hippocrate 10-2881, 1200 Brussels, Belgium

Received 17 September 2017; accepted 20 April 2018; online publish-ahead-of-print 4 May 2018

Introduction

Narrow calibre ICD leads are prone to present insulation defects and conductor externalization. Close follow-up of these leads is recommended but as long as their electrical function is maintained, no prophylactic replacement or extraction is advised. Although the risk of thrombus formation involving externalized conductors has been described, this risk seems considered as negligible compared with the risk of a prophylactic lead extraction. However, when an intracavitary thrombus is identified, the safest therapeutic approach remains undetermined.

Case presentation

In the present clinical vignette, we describe the case of a giant thrombus developed along the externalized portion of an electrically functional ICD lead. In this case, the thrombus was successfully treated with a systemic oral anticoagulation.

Discussion

This case report supports the concept of a prolonged anticoagulation for both the diagnosis and the long-term treatment of thrombus developed along externalized ICD leads, in particular when the patient prefers to avoid or postpone the risk of a trans-venous lead extraction.

Keywords

Riata lead • Conductor externalization • ICD • Thrombosis • Insulation failure • Case report

Learning points

- ICD conductor extrusion can be associated with an increased risk of intracavitary thrombus formation.
- In such situation, systemic oral anticoagulation can be helpful for both the diagnostic and treatment of the patient.
- Individual patient profile and wishes should guide the long-term therapy.

Introduction

Narrow calibre ICD leads have been recalled due to increased risk of insulation failure and cable extrusions.¹ Regular fluoroscopic screening of these leads is recommended. But, as long as they remain electrically functional, no prophylactic replacement or extraction is advised.² However, when an intracavitary thrombus involving externalized conductors is identified, the safest therapeutic approach remains undetermined.

* Corresponding author. Tel: +32 2 764 28.88, Fax: +32 2 764 89.80, Email: jean-benoit.lepolain@uclouvain.be. This article was peer reviewed by reviewers when submitted to "EUPC". Accepted to EHJ Case Reports.

© The Author(s) 2018. Published by Oxford University Press on behalf of the European Society of Cardiology.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com

Timeline

Events	
2008	Reanimated of sudden cardiac arrest— diagnostic: VT/VF Primary cardiac disease: Arrhythmogenic right ventricular dysplasia Implantation of SJM Riata lead
2015	Several appropriate ICD therapy Generator change due to battery depletion
November 2016	Conductor externalization identified during routine ICD follow-up
January 2017	Appropriate ICD therapy for VT TEE/TEO identify a large intracavitary mass where the conductors are externalized Oral AC is started
May 2017	TEE check: atrial thrombus has disappeared
September 2017	Recurrence of VT appropriately treated Patient under OAC No thrombus recurrence

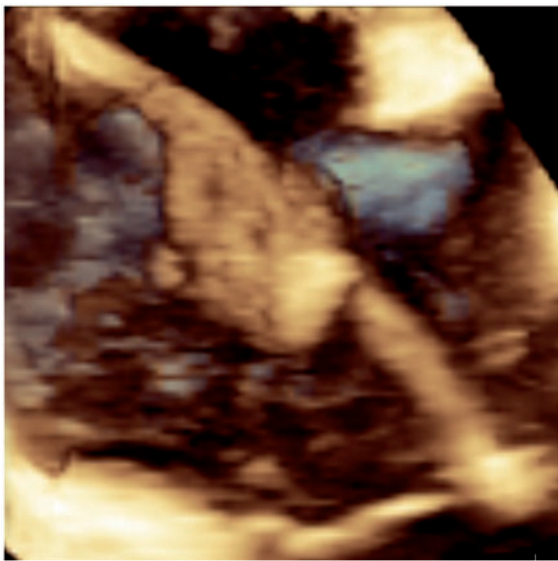


Figure 1 A 3-dimensional transoesophageal echocardiography showing a large thrombus attached along the ICD lead in the right atrium, precisely where fluoroscopic investigation identified the conductor externalization (see *Figure 2*).

Case presentation

A 45-year-old Caucasian man suffering from arrhythmogenic right ventricular dysplasia, and implanted 8 years earlier with a Saint Jude Medical Riata lead, presented to our emergency department after he

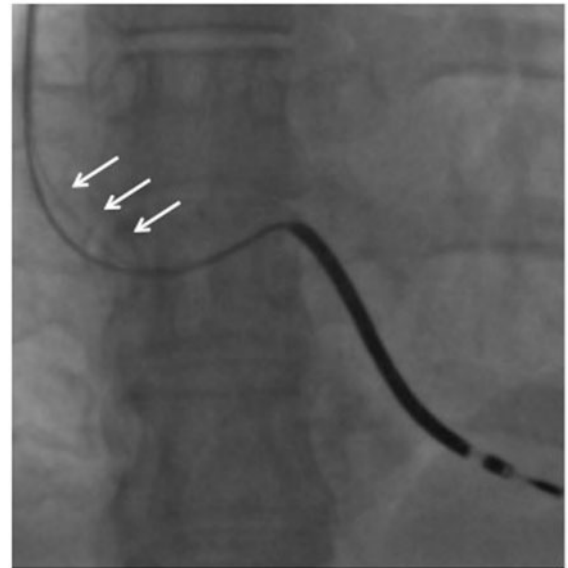


Figure 2 Antero-posterior fluoroscopic examination of the Riata lead demonstrating a clear conductor externalization (arrows) in the right atrium.

received an appropriate therapy for a prolonged episode of slow VT. During his last follow-up (3 months before), an externalization of the conductors at the distal part of the ICD lead was diagnosed, but, the ICD lead remaining electrically functional, the patient was reassured.¹ During his stay at the emergency, the physical exam was normal but a transthoracic echocardiography was performed and identified an endocavitary mass appended to the ICD lead. A 3-dimensional transoesophageal echocardiography confirmed the presence of a large irregular right atrial mass (3 × 2 cm) attached to the ICD lead in the right atrium (*Figure 1* and [Supplementary material online, Video S1](#)), precisely where the fluoroscopic investigation identified the conductor externalization (*Figure 2*, arrows). The CRP being normal, the primary hypothesis was an endocavitary thrombus and the patient was therefore anticoagulated. After 2 months of treatment with acenocoumarol (Target INR = 3), the atrial mass had completely disappeared, confirming thus the suspected diagnosis. At this stage, the patient was proposed for a transvenous lead extraction with reimplantation of a new high voltage lead. However, he declined and opted for a prolonged anticoagulation. At his last follow-up, 9 months after discharge, an echocardiography was performed, confirming the absence of thrombus recurrence.

Discussion

Although narrow calibre ICD leads with insulation defects and conductor externalization are presumed to increase the thrombogenic risk, very few reports were published to document this specific problem.^{3,4} In our opinion, this risk should be taken into account in the clinical decision making process to explant or abandon ICD leads with insulation failure. In this case, the ICD lead remaining electrically

functional, our patient opted for a long-term anticoagulation. Although it might be suggested that a lead extraction would have been a more definite solution with only a limited risk if performed in experienced centres,⁵ the risk of thrombus still exists, even with non-advisory leads. Therefore, we believe that individual patient profile and wishes should guide the therapy.

Supplementary material

Supplementary material is available at *European Heart Journal - Case Reports* online.

Consent: The author/s confirm that written consent for submission and publication of this case report including image(s) and associated text has been obtained from the patient in line with COPE guidance.

Conflict of interest: none declared.

References

1. Carlson M, Tsung P. *Field Safety Notice Update*. Sylmar, CA: St. Jude Medical. <http://webarchive.nationalarchives.gov.uk/20141205150130/http://www.mhra.gov.uk/home/groups/fsn/documents/fieldsafetynotice/con137665.pdf> (6 April 2018).
2. Kusumoto FM, Schoenfeld MH, Wilkoff BL, Berul CI, Birgersdotter-Green UM, Carrillo R, Cha YM, Clancy J, Deharo JC, Ellenbogen KA, Exner D, Hussein AA, Kennergren C, Krahn A, Lee R, Love CJ, Madden RA, Mazzetti HA, Moore JC, Parsonnet J, Patton KK, Rozner MA, Selzman KA, Shoda M, Srivathsan K, Strathmore NF, Swerdlow CD, Tompkins C, Wazni O. 2017 HRS expert consensus statement on cardiovascular implantable electronic device lead management and extraction. *Heart Rhythm* 2017;**14**: e503–e551.
3. Ricciardi D, La Meir M, De Asmundis C, Brugada P. A case of in vivo thrombogenicity of an externalized Riata ST lead. *Europace* 2013;**15**:428.
4. Goyal SK, Ellis CR, Rottman JN, Whalen SP. Lead thrombi associated with externalized cables on Riata ICD leads: a case series. *J Cardiovasc Electrophysiol* 2013;**24**: 1047–1050.
5. Maytin M, Wilkoff BL, Brunner M, Cronin E, Love CJ, Grazia Bongiorno M, et al. Multicenter experience with extraction of the Riata/Riata ST ICD lead. *Heart Rhythm* 2014;**11**:1613–1618.