# Delayed cardiac perforation of the Durata implantable cardioverter-defibrillator lead more than 1 year after implantation

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## Introduction

The rate of implantable cardioverter-defibrillator (ICD) lead perforations has been reported to be in the range of 0.6%–5.2%, with the majority of cases occurring within 1 month of implantation.[1] However, isolated reports of delayed ICD lead perforations occurring more than 1 year and up to 3 years after implantation have been described.[2–4] Here, we present a case of a patient with a Durata ICD lead who presented with syncope and cardiac tamponade due to lead perforation more than 1 year after implantation.

## Case report

A 40-year-old man with a history of Brugada syndrome underwent implantation of an ICD with a Durata 7122Q lead (St. Jude Medical, St. Paul, MN) at an outside hospital. The procedure was performed uneventfully. At the time of implantation, the patient had a ventricular R-wave amplitude of 11.9 mV, a pacing threshold of 1.0 V at 0.5 ms, and a lead impedance of 508 Ω. He had an in-office interrogation 8 months later, which revealed a ventricular R-wave amplitude of 11.7 mV, a pacing threshold of 1.25 V at 0.5 ms, and a lead impedance of 310 Ω.

Fourteen months after device implantation, he experienced intermittent left shoulder pain. An echocardiogram showed no pericardial effusion. He was admitted to our hospital 2 weeks afterward with syncope. A transthoracic echocardiogram showed a large pericardial effusion with the defibrillator lead tip lodged in the pericardial space (Figure 1 and Online Supplemental Video). Device interrogation revealed a decreased ventricular R-wave amplitude of 1.2 mV, an elevated right ventricular pacing threshold of 4.5 V at 0.5 ms, and a decreased lead impedance of 190 Ω that had trended down from normal levels within a 1-month period. Pericardiocentesis was performed, and 600 $cm^3$ of hemorrhagic fluid was drained. The patient underwent device and lead removal in a hybrid operating room without need for further intervention and was discharged 2 days later.

## Discussion

To our knowledge, this case is the first report of delayed Durata lead perforation occurring more than 1 year after implantation. Concerns about delayed cardiac perforations with small diameter ICD leads, mainly involving the St. Jude Riata lead, have been raised by single-center studies.[5,6] In these series, all perforations occurred within 6 weeks of lead implantation. Similarly, 2 previously published cases of delayed cardiac perforation with the Durata lead occurred within 6 weeks of implantation.[7,8]

The mechanism behind the marked delay (>1 year) in the occurrence of lead perforation in this patient is unclear. This patient did not have known risk factors for lead perforation,

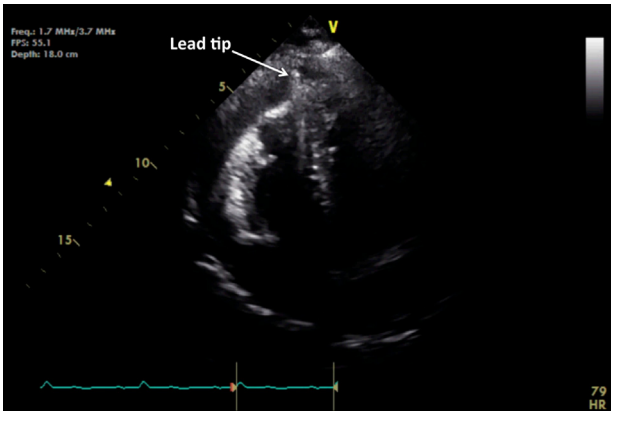


**Figure 1** Video still of an apical 4-chamber view of the transthoracic echocardiogram of the case patient. Pericardial effusion is present along the right ventricle with the Durata lead tip visualized in the pericardial space, confirming perforation.

**KEYWORDS** Defibrillator lead; Cardiac perforation; Pericardial effusion
(Heart Rhythm Case Reports 2016;2:377–378)

Dr Cheung has received speaker honoraria from Biotronik and Medtronic, research grant support from Biotronik, and fellowship grant support from Biotronik, Boston Scientific, Medtronic, and St. Jude Medical.

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http://dx.doi.org/10.1016/j.hrcr.2016.04.005

## KEY TEACHING POINTS

- This case report describes a case of delayed perforation of the Durata implantable cardioverter-defibrillator lead more than 1 year after implantation.
- Lead perforation led to a late presentation of pericardial effusion with cardiac tamponade.
- This case report highlights the importance of continued vigilance for mechanical complications of lead placement even more than 1 year after implantation.

such as steroid use, low body mass index, or older age.[9] The design of the Durata lead incorporates a curve along the right ventricular shock coil with a flanged silicone tip to reduce lead tip pressure and potentially reduce the risk of cardiac perforation. It has been postulated that the preformed slight curvature of the Durata lead may lead to unpredictable rotation of the lead body screw deployment that may lead to perforation.[10] In addition, despite the presence of a flanged silicone tip, the decreased lead diameter may still lead to increased pressure at the lead tip, resulting in cardiac perforation. Between the time of implantation and follow-up 8 months later, that patient has a mild decrease in the lead impedance and minimal elevation of the pacing threshold, which may have reflected minimal migration of the lead tip. It is possible that over time, with continued cardiac motion, the lead gradually advanced into the pericardial space over a period of several months before the acute formation of a pericardial effusion and onset of symptoms. This case underscores the importance of vigilance for delayed mechanical complications of ICD lead placement even more than 1 year after lead implantation.

## Appendix

### Supplementary data

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.hrcr.2016.04.005.

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