EP CASE REPORT

Subcutaneous implantable cardioverter-defibrillator infection affecting deep tissues: is it always mandatory to remove the device?

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Introduction

Subcutaneous implantable cardioverter-defibrillators (S-ICDs) offer theoretical advantages over transvenous ICDs (TV-ICDs) because they reduce the risk of systemic infection; however, they are associated with a comparatively higher rate of local infection.[1] Therapeutic strategies for infected wounds differ between the two. The management of S-ICD infections has yet to be defined.

Case report

A 64-year-old man with a clinical history of type 2 diabetes mellitus, stage 4 chronic renal failure, and ischaemic cardiomyopathy underwent implantation of an EMBLEM S-ICD (Boston Scientific, MA, USA). Pre-procedural antibiotic prophylaxis was administered according to protocol. The device was implanted using a three-incision technique. The pulse generator was placed in the space between the anterior surface of the serratus anterior muscle and the posterior surface of the latissimus dorsi. Based on a surface electrocardiogram screening for an S-ICD, the lead was inserted parallel to the right sternal border. The inferior parasternal incision, 2 cm in length, was placed horizontally 1 cm to the right of the sternal border just below the level of the xiphoid process. The superior parasternal incision, 1 cm in length, was placed vertically 1 cm lateral to the right sternal border to fix the tip of the lead.

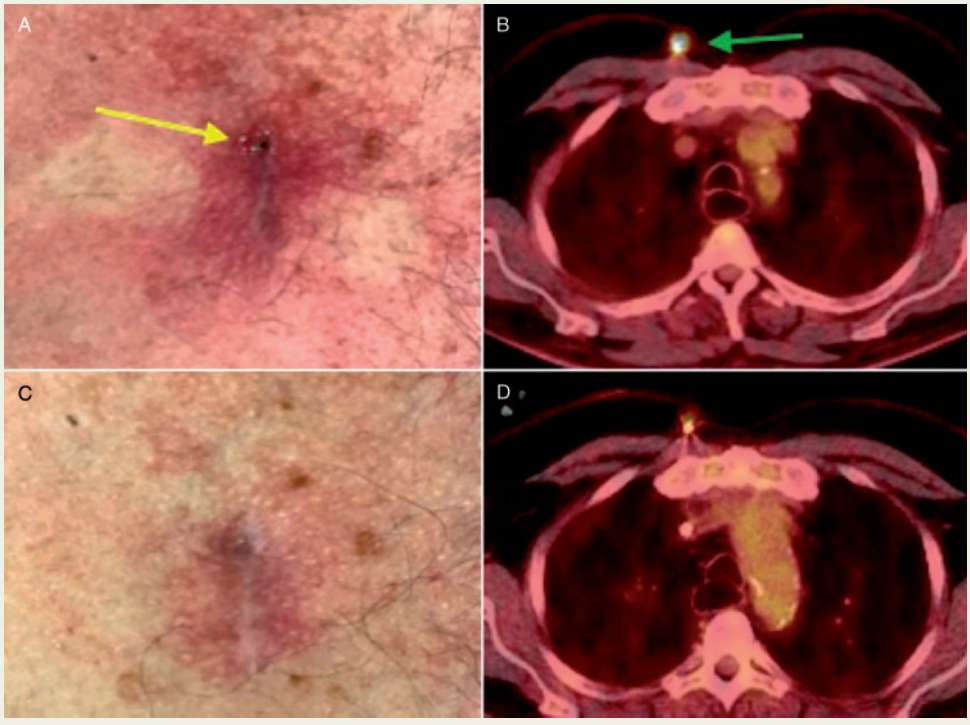

Figure 1 (*A*) Fistula (yellow arrow) with a purulent secretion at the superior parasternal wound. (*B*) The PET/CT shows abnormal uptake of 18F-FDG at the upper parasternal incision (lead tip, green arrow), a finding compatible with subcutaneous infection of the S-ICD. (*C*) Clear improvement of the wound and closure of the fistula. (*D*) 32 months after implantation, the PET/CT shows a significant decrease in 18F-FDG uptake at the level of the distal lead tip.

After 2 months, the patient was admitted with a fistula containing a purulent secretion at the superior parasternal incision (*Figure 1A*). Symptoms and signs of a systemic infection were absent. Laboratory studies were unremarkable. Wound cultures were positive for negative-coagulase staphylococcus; blood cultures were negative. A positron emission tomography/computed tomography (PET/CT)

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showed abnormal uptake of ^{18}F-FDG in the superior parasternal incision and at the distal lead tip (*Figure 1B*), a finding compatible with subcutaneous infection of the S-ICD. Because the device was in an extravascular location and systemic infection was absent, a conservative strategy was adopted. gOral antibiotic therapy with clindamycin for 10 days resulted in the resolution of all signs of local infection (*Figure 1C*). Now 32 months after implantation, the patient remains asymptomatic even though the uptake of 18F-Fluorodeoxyglucose ($^{18F-}$F-FDG) PET/CT continues to be abnormal at the level of the distal lead tip (*Figure 1D*).

Discussion

Large studies have shown that the infection rate for S-ICDs is ~5.5–6.0% and that the need for surgical device removal is low.[2] Previous case series studies have shown that superficial wound infections are often successfully treated with antibiotics, and device removal is unnecessary; however, if infection clearly persists at the S-ICD with exudate, device removal is recommended.[2,3]

In our case, superficial wound infection was associated with the uptake of ^{18}F-FDG PET/CT at the level of the distal lead tip. If the device was a TV-ICD, explant of the device would have been mandatory.

This case highlights that, despite local infection, the extravascular location of the S-ICD allows a conservative strategy to be adopted and that device removal is necessary only for those patients who lack a favourable clinical evolution, either because signs of local infection persist or because signs and symptoms of systemic infection develop.

Conflict of interest: L.M. declares consulting services, and advisory boards to St. Jude Medical (Now Abbott), Medtronic, Biotronik, Boston Scientific, Livanova, and Johnson&Johnson. J.M.T. declares consulting services, and advisory boards to St. Jude Medical (Now Abbott), Medtronic, Biotronik, and Boston Scientific. All the other authors declare no financial involvement with any organization and have no conflict of interest with the subject matter discussed in the manuscript.

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