

# Skin burn after magnetic resonance imaging in a patient with an implantable cardioverter-defibrillator



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## Introduction

The performance of magnetic resonance imaging (MRI) is increasing in patients with cardiac implantable electronic devices (CIED). Conditional CIED are designed to ensure MRI safety under specified conditions. Thermal injury is a rare complication with MRI in CIED patients. It is postulated to be related to radiofrequency heat deposition at the lead tissue interface.<sup>1</sup> Thermal burns related to MRI use is not new, with serious second and third degree burns reported in the literature.<sup>2</sup>

## Case report

An 82-year-old male patient with an MRI-conditional Boston Scientific dual-chamber implantable cardioverter-defibrillator (ICD) (generator model number D433 Resonate EL; atrial lead model number 0673 Reliance; ventricular lead model number 7842 Ingevity) presented with gait instability. He underwent a 1.5 Tesla brain MRI to rule out a subdural hematoma. Interrogations pre and post MRI were unchanged. Two days later erythema and warmth on the skin directly above the ICD generator was noted (Figure 1A). Fluctuance at the site and fever were absent.

Laboratory testing demonstrated a normal white blood cell count ( $7.7 \times 10^9/L$ ), erythrocyte sedimentation rate (10 mm/h), negative blood cultures and mildly elevated C-reactive protein (12 mg/L), remained unchanged when

repeated 7 days later. The skin findings resolved 14 days later without intervention (Figure 1B).

## Discussion

The observed skin findings are consistent with a skin burn temporally associated with the recent MRI. It is noteworthy that this occurred in the absence of perturbations to pacing and sensing. We speculate the limited subcutaneous tissue adjacent to this patient's device, its protuberance, and the size of his ICD may have caused the skin burn.

The mechanism of thermal injury with an MRI-conditional device is complex and likely related to radiofrequency fields.<sup>1</sup> Although the properties of materials used in MRI-conditional ICDs minimize skin burns, unexpected heating may result in thermal injury at the ICD generator site.

Collaborative reporting of unexpected findings such as pocket burns to the CIED manufacturer, MRI and CIED department is necessary to foster patient safety.

## References

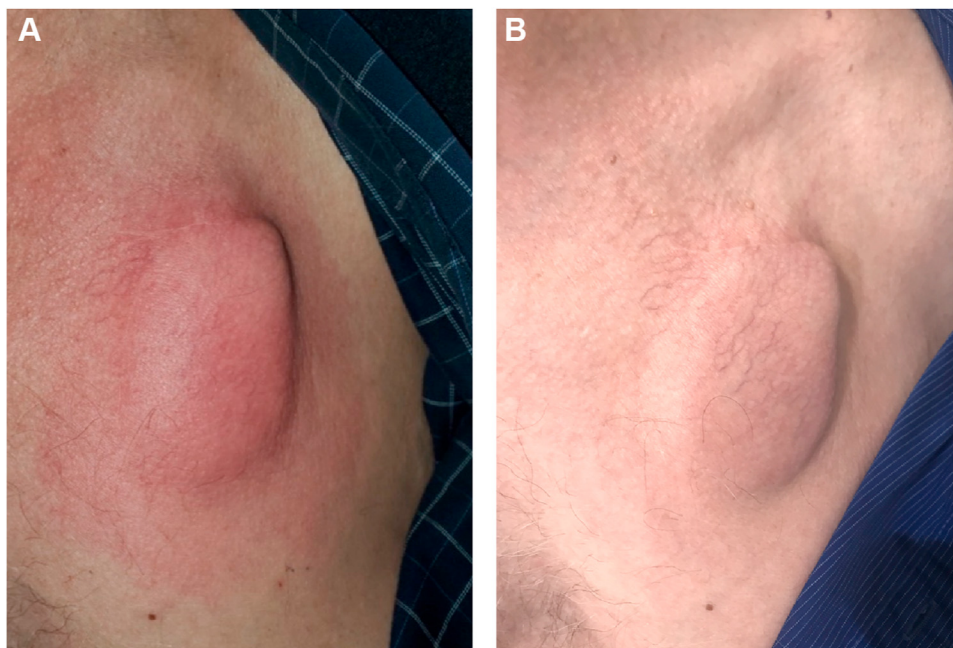
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**KEYWORDS** Magnetic resonance imaging; Conditional implantable cardioverter-defibrillator; Radiofrequency energy; Thermal injury; Collaborative reporting (Heart Rhythm Case Reports 2022;8:539–540)

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Funding Sources: None. Disclosures: The authors have no conflict of interest to disclose. **Address reprint requests and correspondence:** Ms Suzette Turner, Sunnybrook Health Sciences Centre, 2075 Bayview Ave, Toronto, ON M4N 3M5, Canada. E-mail address: [suzette.turner@sunnybrook.ca](mailto:suzette.turner@sunnybrook.ca).



**Figure 1** A: ICD pocket 2 days post MRI. B: ICD pocket 14 days post MRI.