A Curious Case of Breast Tissue Expander

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Abstract

We present a case of an individual who was found to be emanating a sound from her implantable cardioverter defibrillator (ICD). She had developed breast carcinoma requiring mastectomy and breast tissue expander implantation. The magnetic port on the breast tissue expander led to electromagnetic interference and magnet mode conversion. The ICD's conversion to magnet mode can be dangerous, because it blocks tachyarrhythmia detection and therapy.

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Key Words

Implantable Cardiac Defibrillator • Breast Tissue Expander • Magnet Mode Reversion • Interference • Implantable cardiac defibrillator

Case

A 57-year-old female presented to our facility with emission of a low-frequency hum emanating from her implantable cardioverter defibrillator (ICD). The tone increased in frequency and duration over the previous 5 days. She was diagnosed with hypertrophic cardiomyopathy in 2004 with high-risk features, a history of nonsustained ventricular tachycardia, septal thickness of 29 mm, and a family history of unexplained death in two maternal uncles. The patient underwent implantation of a single-chamber, dual coil Medtronic Protecta XT ICD for primary prevention in 2004 and a generator change in 2012. She subsequently developed ductal carcinoma in situ of the left breast in October 2013,

leading to a bilateral mastectomy, breast tissue expander implantation, and repositioning of her ICD generator superior to her previous pocket in November 2013.

She reported no chest pain, trauma, shortness of breath, syncope, lightheadedness, palpitations, any pain to extremities, or any systemic complaint. She reported no history of defibrillator shocks in the past 12 years.

Her device interrogation revealed appropriate device function, with adequate sensing, impedance, and capture thresholds with intact lead integrity. A chest roentgenogram is shown in [Figure 1](#). Further review of the patient's history revealed that in January 2014, she began receiving gradual filling of her tissue expanders with saline by plastic surgery. The device tone began after the third saline infusion. Therefore, it was suspected that the gradual filling of the tissue expanders was somehow related to her device malfunction.

A review of the literature indicated that some breast tissue expanders have magnetic ports to allow for a more accurate detection of the injection site. ICD tachytherapy is routinely deactivated by magnet application. Tikka et al. [1] reported a case of ICD tachytherapy deactivation by a laptop computer. There has been an isolated report of breast tissue expander magnet dislodgement with magnetic resonance imaging [2].

Plastic surgery was consulted and tissue expander decompression resulted in the resolution of the alert tone. In an ex vivo environment, the Medtronic ICD and the breast tissue expander

Figure 1. PA and lateral chest roentgenograms depicting proximity of the intracardiac defibrillator and the breast tissue expander and magnet (**black arrows**).

Figure 2. Ex vivo breast tissue expander with magnet (**black arrow**).

(Figure 2) were brought into close proximity. At a distance of approximately 1 cm, a similar magnetic interaction hum was generated from the ICD with suspension of tachycardia therapy on the monitor. Subsequently, it was deduced that the

ICD was deactivated by the magnet in the tissue expander port. In the interim, the breast tissue expanders were removed with resolution of patient's symptoms.

This is a novel case that illustrates the interplay between magnetic tissue expander location and defibrillator function. It serves as a reminder that breast tissue expanders or prosthetic devices with a magnet can result in failures to sense tachyarrhythmias and deliver appropriate therapy. It also highlights the need for added vigilance and electrophysiology collaboration for patients requiring magnetic prosthetic devices and an implantable defibrillator.

Conflict of Interest

The authors have no conflicts of interest relevant to this publication.

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