Fistula With Foreign Body Granulomatous Reaction Secondary to Retained Electrodes After Pacemaker Removal

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To the Editor:

Cardiac pacemaker implantation is a common clinical procedure. Although granulomatous dermatitis caused by titanium pacemaker generators has been reported in the literature, chronic skin manifestations due to the electrodes or their cables (the other 2 components of pacemakers apart from the generator) are rarely mentioned.[1]

Complications caused by not removing certain components of old pacemakers vary between 3% and 30%.[1] Skin changes include erosions caused by the tips of the cables, the formation of draining sinuses or fistulas, local infections, and foreign body granulomas.[1,2]

We report a new case of a cutaneous fistula with a foreign body granulomatous reaction secondary to retained pacemaker cables.

The patient was an 88-year-old man with no known drug allergies and with a past history of surgery for a fracture of the left femur, systemic hypertension, hypercholesterolemia, hiatus hernia, and atrial fibrillation. He had a cardiac pacemaker located in the abdominal wall—it had previously been located on the left side of the chest but had been changed 3 years earlier due to poor function. He was on antiplatelet and lipid-lowering medication.

The patient was seen for a friable, exudative, hemorrhagic, papulonodular lesion that had appeared about 2 months earlier, close to the area of the old pacemaker scar on the chest. There was a palpable, soft, subcutaneous mass of about 2 cm by 1 cm (Figure 1).

Histopathologic study of the 2 biopsies showed a well-delimited, granulomatous nodular lesion, surrounded by polymorphonuclear cells and foreign body-type multinuclear giant cells and a granulomatous inflammatory center with new blood vessel formation and lymphoplasmacytic infiltrates (Figure 2). Both biopsies were compatible with a foreign body granulomatous reaction. Cultures of the exudate and of a new biopsy were negative.

In the thoracic ultrasound, a hypoechogenic residual collection was apparent with a fusiform shape, measuring 3.7 cm by 7 mm, situated below the muscle planes, close to the sternum, and a refringent linear image situated within an anechoic tubular structure, caused by a remnant of a catheter or cable of the withdrawn pacemaker. Residual cables were confirmed on a chest radiograph, which

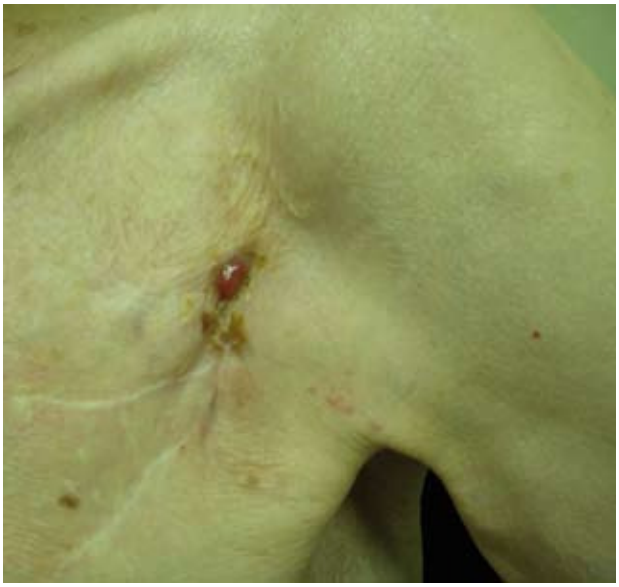

Figure 1. Soft, friable, papulonodular lesion of 2 cm by 1 cm in the superior part of the old pacemaker scar on the chest.

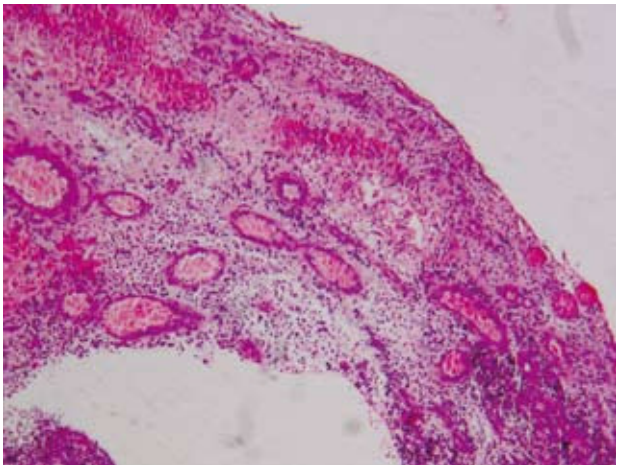

Figure 2. Histopathologic study showing a granulomatous lesion surrounded by polymorphonuclear cells and foreign body-type multinuclear giant cells and with a granulomatous inflammatory center with new blood vessel formation and lymphoplasmacytic infiltrates, consistent with granulation tissue associated with an underlying foreign body granulomatous reaction (hematoxylin-eosin, 10×).

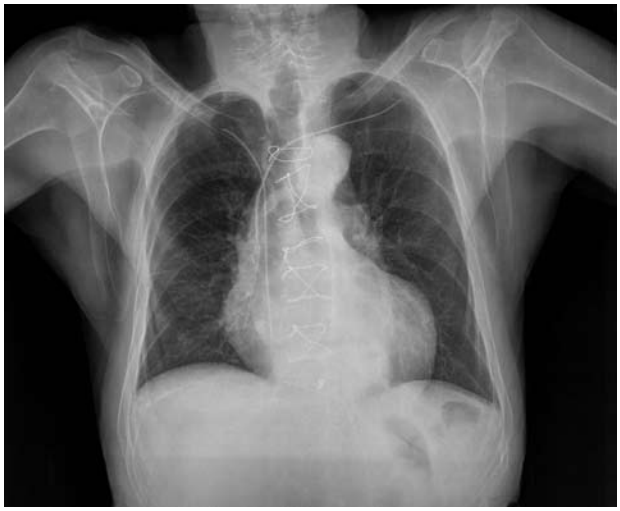

Figure 3. Anteroposterior chest radiograph showing the abandoned electrodes of the withdrawn pacemaker, with the cables in a subclavicular position. The longest cable coincided with the site of the lesion. The other end was located in the right ventricle. The electrode coming from the area of the abdomen can be seen on the lower part of the radiograph, with its free end in the ventricle.

showed the 2 abandoned cables, the longest of which coincided with the area of the granulomatous lesion and ran to the right ventricle (Figure 3).

With the diagnosis of cutaneous fistula with a foreign body granuloma secondary to abandoned pacemaker electrodes, the cardiac surgery department was contacted. In a theater equipped for emergency surgery in case any complication should arise, the granuloma was excised and the abandoned prosthetic material, found to be the fragmented cables, was withdrawn. The operation was uneventful.

Pacemakers consist of 3 components: the pulse generator, the cables, and the electrodes.[3] In normal practice, when a pacemaker is removed due to rejection, local infection, or sepsis, the pulse generator is removed and the other components are left in place, as the complications associated with their withdrawal could put the patient's life at risk and make extraction difficult.[4] Few health care professionals are aware of the abandoned metallic material, and this can lead to inappropriate treatment of these lesions. The most important complications of such inadvertent manipulation are laceration of the myocardium or of the tricuspid valve, the induction of cardiac arrhythmias, breakage with migration of the electrode, and hemopericardium.[1,5]

The incidence of complications if some of the pacemaker material is left in place varies between 3% and 30%. The most common are cable migration, the formation of a loop within the ventricle, muscle excitation, sensor error, pulmonary thromboembolism, hemopericardium, pleural retractions, and superior vena cava syndrome.[1,6] The complications in the skin that can be caused by abandoning those components include erosions from the ends of the cables, the formation of draining sinuses or fistulas, local infections, and granulomatous foreign body reactions.[1]

The most likely mechanism of induction of the foreign body granuloma appears to be the recurrent stimulus of minimal trauma by the ends of the cables, producing fibrosis and inflammatory changes.[2] In the case presented by Kootiratrakarn et al,[2] withdrawal of the residual cables led to regression of the granulomatous mass. Their extraction using percutaneous techniques must be undertaken in centers where it is possible to perform emergency surgical procedures should a complication develop.[7] To avoid the risks of cable withdrawal, some authors have proposed cutting the ends of the cables and suturing them to the underlying fascia.[8]

Dermatologists who suspect this type of late lesion in a pacemaker scar should contact the cardiology and cardiac surgery departments in order for management to be determined jointly. In the outpatient setting, we should be aware of the possible complications that could arise from an inappropriate manipulation of the lesions, such as performing electrocoagulation or inadvertent extraction of the abandoned cables.

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Conflicts of Interest
The authors declare no conflicts of interest.

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Diltiazem-Induced Acute Generalized Exanthematous Pustulosis: a Case Report and Review of the Literature

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To the Editor:

The term acute generalized exanthematous pustulosis (AGEP), coined by Beylot in 1980, refers to a rare form of cutaneous hypersensitivity characterized by multiple, small, sterile, nonfollicular pustules, appearing in groups on an area of erythematous skin.[1] Although AGEP has sometimes been attributed to enterovirus infection or exposure to mercury, in 90% of cases it constitutes a drug-induced skin reaction.[1] The antimicrobials, mainly the aminopenicillins, macrolides, and terbinafine figure among the most frequently implicated agents, although cases of AGEP have been reported associated with a long list of drugs including allopurinol, cyclooxygenase-2 inhibitors, omeprazole, and antiepileptic drugs.[2,3] We present a case of AGEP that occurred in the context of the administration of diltiazem.

The patient was an 84-year-old woman with a history of long-standing systemic hypertension and atrial fibrillation. She was admitted to our hospital for decompensation of her heart failure. She denied any history of psoriasis. Her usual treatment included furosemide, verapamil, omeprazole, and acenocoumarol. At the time of admission, verapamil was changed to diltiazem (60 mg/d), but there were no other changes to her treatment. After 11 days in the hospital, she developed an erythematous rash on the trunk and abdomen and in the groin; numerous, nonfollicular, slightly confluent, pustular lesions then rapidly appeared on the rash (Figure 1). There was associated fever and general malaise, but no involvement of mucosal surfaces. The important finding in the blood tests was the presence of leukocytosis (20 400 cells/µL, with 87% neutrophils). Microbiological study was negative. Skin histology revealed multiple subcorneal pustules in different phases, formed of neutrophils, associated with a perivascular and periadnexal lymphocytic infiltrate (Figure 2). With the suspected diagnosis of diltiazem-related AGEP, treatment with that drug was interrupted. The fever resolved within 48 hours and the rash disappeared rapidly after a few days, associated with minimal desquamation.

From a clinical point of view, AGEP is characterized by the sudden onset of a pustular rash, predominantly affecting the trunk and skin folds, arising on an edematous area of diffuse erythema.[2] The rash is usually associated with systemic manifestations (fever, leukocytosis, and renal failure), although life-threatening disease is very rare. Mucosal involvement is rare and is limited to the oral

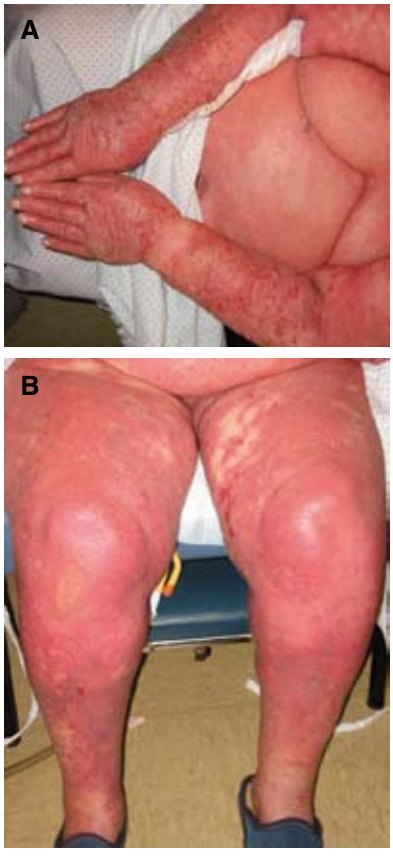

Figure 1. Edematous, erythematous rash with multiple, small, partially confluent pustules: A, on the trunk and upper limbs, and B, on the lower limbs.