repeating with the same dose that caused the reaction or returning to the preceding dose.

This protocol was performed prior to the interventional procedure (7 patients) or within 48 hours of revascularization in patients admitted for ST-elevation acute myocardial infarction (6 patients). One patient (with no prior history of drug allergy) developed an urticaria-like reaction after administration of the drug and revascularization, and so the desensitization protocol was followed. Antileukotrienes (24 hours before and 1 hour before) and dexchlorpheniramine (1 hour before) were administered as premedication in the patient with a history of prior anaphylaxis. The protocol, which we applied in the Intensive Cardiology Care Unit but which could equally well have been applied in the hospital ward according to our results, had a successful outcome in all cases, with no reactions or complications of any type. Dose modifications or an increased interval between doses were not required. A daily dose of 100 mg of acetylsalicylic acid was maintained. Likewise, during follow-up, which lasted a median of 27.5 months (interquartile range, 10 to 40 months), no complications were reported.

The patients were to take acetylsalicylic acid daily without interruptions, which might have led to a loss of tolerance after between 2 and 5 days in the case of pseudoallergic reactions and after 24 hours in the case of allergic reactions.[6] To become tolerant once again, a repeat desensitization procedure would have been needed.

Our study applied a single, standard desensitization protocol in patients with a history of skin reactions or anaphylaxis, regardless of whether the mechanism was immunologic. Sensitivity to acetylsalicylic acid is a serious condition. However, whatever the underlying mechanism and clinical manifestation, such sensitivity should not, we believe, rule out use of this drug in patients with ischemic heart disease, whether during the acute phase of the disease or in the prevention of new events, if the benefits are thought to outweigh the potential risks. The rapid desensitization protocol, as practiced in our center in these patients, has shown a good safety and efficacy profile. This allows the protocol to be used for acetylsalicylic acid without short or long-term complications.

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## REFERENCES

1. Perk J, de Backera G, Gohlkea H, Grahama I, Reinerb Z, Verschurena M, et al. Guía europea sobre prevención de la enfermedad cardiovascular en la práctica clínica (versión 2012). Rev Esp Cardiol. 2012;65:937. e1- e66.
2. Kowalski ML, Makowska JS, Blanca M, Bavbek S, Bochenek G, Bousquet J, et al. Hypersensitivity to nonsteroidal anti-inflammatory drugs (NSAIDs) – Classification, diagnosis and management: review of the EAACI/ENDA and GA2LEN/HANNA. Allergy. 2011;66:818–29.
3. White AA, Stevenson DD, Woessner KM, Simon RA. Approach to patients with aspirin hypersensitivity and acute cardiovascular emergencies. Allergy Asthma Proc. 2013;34:138–42.
4. Chapman AR, Rushworth GF, Leslie SJ. Aspirin desensitization in patients undergoing percutaneous coronary intervention: A survey of current practice. Cardiol J. 2013;20:134–8.
5. Dalmaua G, Gaiga P, Gázqueza V, Mercé J. Desensibilización rápida al ácido acetilsalicílico en pacientes con intolerancia a AINE afectos de síndrome coronario agudo Rev Esp Cardiol. 2009;62:224–5.
6. Pleskow WW, Stevenson DD, Mathison DA, Simon RA, Schatz M, Zeiger RS. Aspirin desensitization in aspirin sensitive asthmatics patients: clinical manifestations and characterization of refractory period. J Allergy Clin Immunol. 1982;69:11–9.

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## Inappropriate Defibrillator Shock in a Subcutaneous Device Secondary to Repetitive Muscle Contractions

### *Descarga inapropiada de desfibrilador en un dispositivo subcutáneo secundaria a contracciones musculares repetitivas*

**To the Editor,**

We would like to call attention to the case of a 32-year-old woman that was admitted to our hospital after a subcutaneous implantable cardioverter defibrillator (ICD) shock. One month earlier she underwent implantation of an entirely subcutaneous ICD (Boston Scientific Inc., Natick, Massachusetts, United States) in the setting of secondary prevention and familial long QT syndrome. No other episodes of sudden death were reported in her family and after first degree familial screening it was found that her mother also had a long QT interval. At implantation, a satisfactory position of the subcutaneous lead was achieved and therapies were programmed over 200 beats per minute for the conditional shock and 220 beats per minute for the shock zone. It was found during device interrogation that an inappropriate shock was delivered secondary to external noise detection that was interpreted as tachycardia (ventricular tachycardia/ventricular fibrillation) (Figure 1). The patient reported that prior to the shock she started clapping and after 15 to 30 seconds felt the electric shock. For that reason we tried to reproduce the external noise while clapping and discovered that 2 of the 3 possible sensing vectors (secondary and alternate) reproduced it systematically. Luckily it was almost imperceptible with the primary sensing vector (Figure 2).

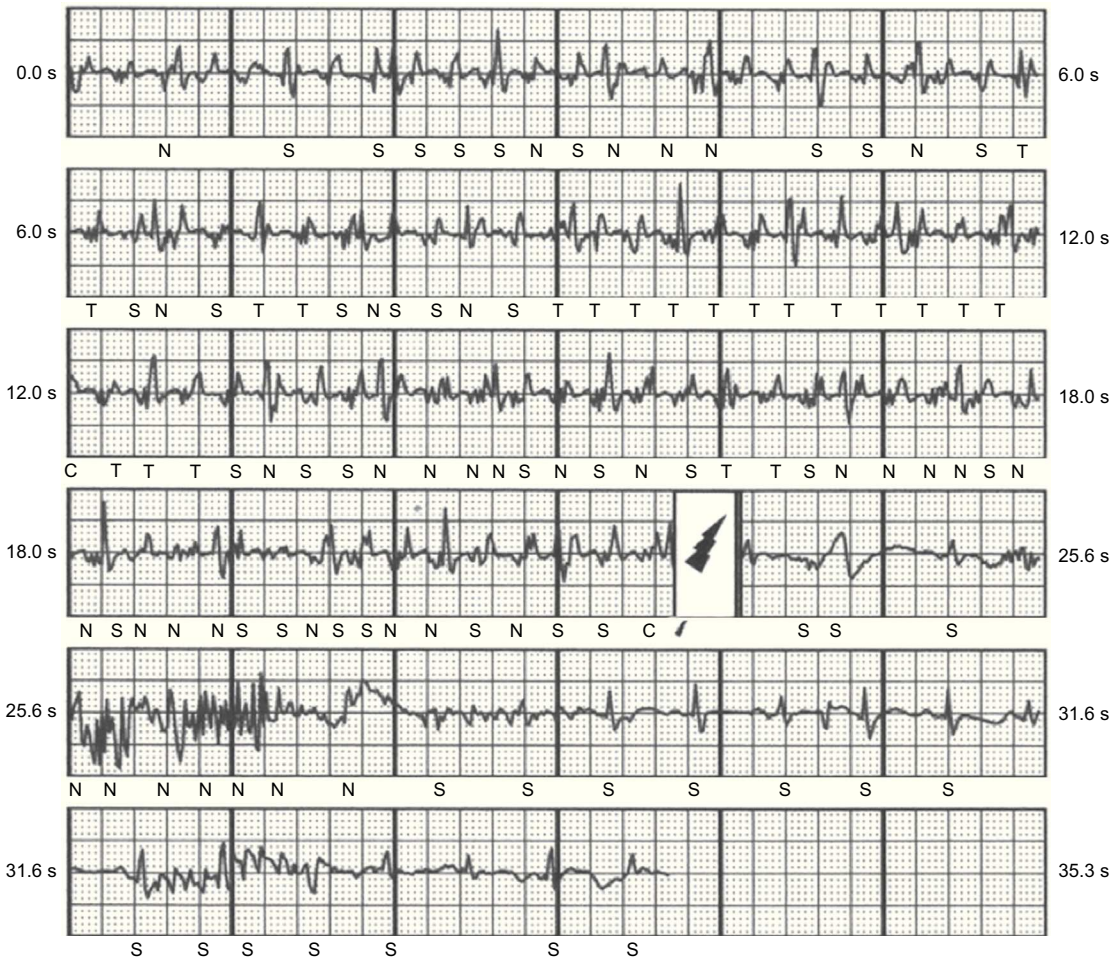


**Figure 1.** Inappropriate shock delivery after tachycardia sensing using the secondary sensing vector. Shock was not aborted, probably because of the repetitive noise. C, charge; electric ray, shock delivery; N, noise; S, sensing; T, tachycardia.

The overall incidence of inappropriate shock deliveries in subcutaneous ICDs varies in different series from 4%[1] to 25%.[2] It has been reported that such shocks can decrease quality of life or increase mortality in these patients.[3,4] Whether such findings also occur with subcutaneous ICDs still has to be proven. In the Weiss et al study,[5] inappropriate shock delivery was comparable to such incidence among intravascular ICDs, but with fewer supraventricular tachycardias and more T-wave oversensing. The use of the conditional zone (rate plus discriminators) also led to fewer inappropriate shocks.[5] In general, it has been reported that T-wave oversensing is the most common cause for inappropriate shocks from subcutaneous ICDs[5]. Aside from T-wave oversensing and supraventricular tachycardias, broad QRS complexes and noncardiac oversensing have been reported as exceptional reasons for inadequate shocks.[6] Interestingly, in the Weiss et al study 3 patients received an inappropriate shock as a result of external noise while working with electrical equipment.

We describe another possible cause of inappropriate shocks secondary to myopotentials oversensing that has not been previously reported. It was very interesting that the external noise was only present when the sensing vectors were using the tip of the cable (alternate and secondary sensing vectors). We postulate that pectoral muscular contractions during clapping produced myopotentials interference specifically in this part of the cable and that it caused the external noise that was interpreted as tachycardia/ventricular fibrillation. It has been emphasized that T-wave oversensing must be avoided during device implantation, using any of the 3 possible sensing vectors. After this finding, we are going to check for myopotentials after repetitive and rhythmic contractions in our patients, even though no prior situation has

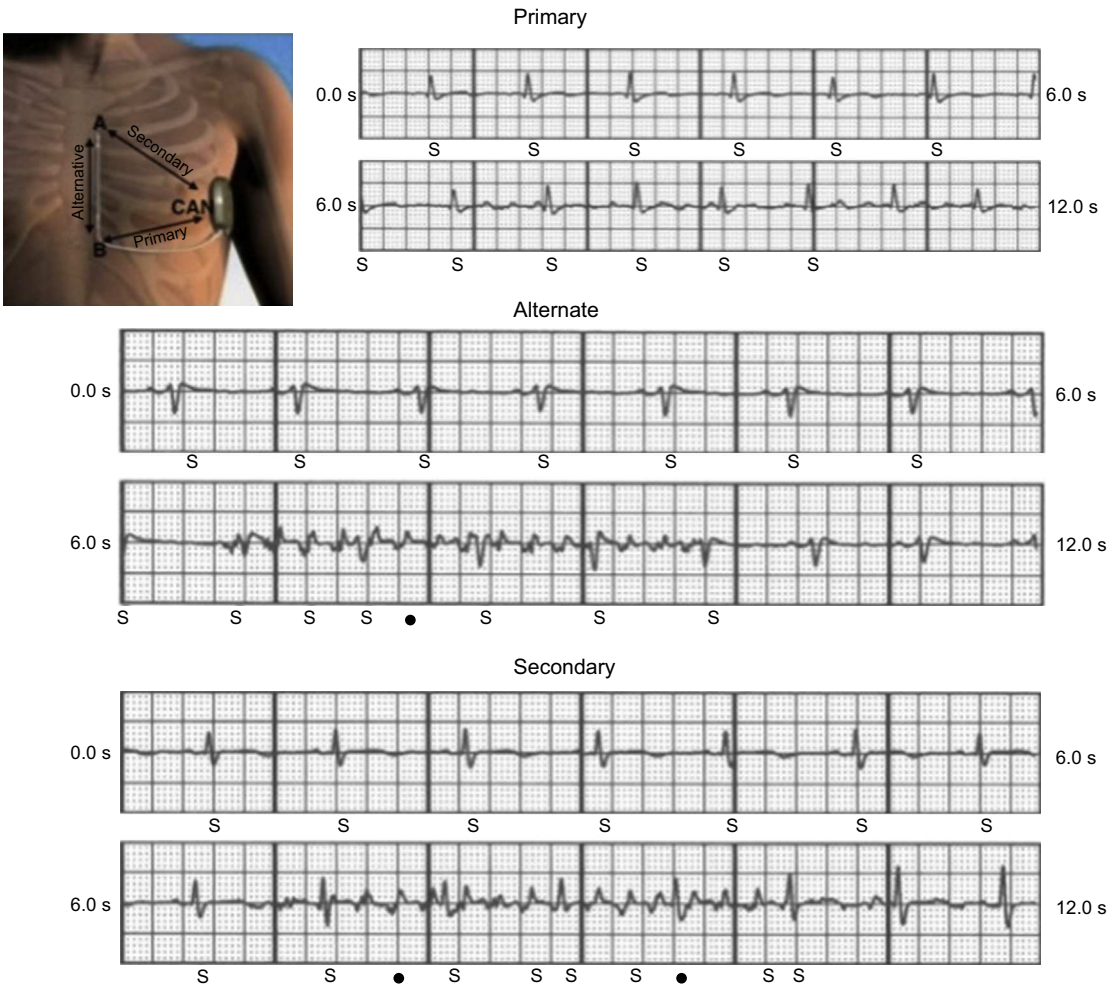


**Figure 2.** External noise detection while clapping, with the 3 possible sensing vectors of the device. Noise was almost unnoticeable with the primary configuration. On the contrary, it was clearly reproduced with the secondary and alternate sensing vectors.

been reported in the literature and this is probably an uncommon cause of inappropriate shock. Since this is a relatively new technology and subcutaneous ICDs programming and follow-up is somewhat different compared to conventional ICDs, we recommend that other clinicians look for myopotentials and choose the vector with fewer artifacts and better T-wave sensing.

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## REFERENCES

1. Köbe J, Reinke F, Meyer C, Shin DI, Martens E, Kääb S, et al. Implantation and follow-up of totally subcutaneous versus conventional implantable cardioverter-defibrillators: A multicenter case-control study. Heart Rhythm. 2013;10:29–36.
2. Jarman JWE, Lascelles K, Wong T, Markides V, Clague JR, Till J. Clinical experience of entirely subcutaneous implantable cardioverter-defibrillators in children and adults: cause for caution. Eur Heart J. 2012;33:1351–9.
3. Rosenqvist M, Beyer T, Block M, Den Dulk K, Minten J, Lindemans F. Adverse events with transvenous implantable cardioverter-defibrillators: a prospective multicenter study. European 7219Jewel ICD investigators Circulation. 1998;98:663–70.
4. Poole JE, Johnson GW, Hellkamp AS, Anderson J, Callans DJ, Raitt MH, et al. Prognostic importance of defibrillator shocks in patients with heart failure. N Engl J Med. 2008;359:1009–17.
5. Dubner S. Implantation and follow-up of totally subcutaneous vs conventional implantable cardioverter-defibrillators: A multicenter case-control study. Heart Rhythm. 2013;10:37–8.
6. Weiss R, Knight BP, Gold MR, Leon AR, Herre JM, Hood M, et al. Safety and efficacy of a totally subcutaneous implantable-cardioverter defibrillator. Circulation. 2013;128:944–53.

http://dx.doi.org/10.1016/j.rec.2014.02.006