S-ICD and chest compressions oversensing: new experience

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Dear Editor,

We read with interest the article of Cmorej et al. (1) – **Inappropriate shocks from subcutaneous implantable cardioverter – defibrillator induced by chest compressions,** published in the Cardiology Letters. A similar case report also was presented by Berkovitz et al. (2) in Pacing Clinical Electrophysiology in 2018. These two case reports are probably the only presented cases of inappropriate shocks of subcutaneous implantable cardioverter-defibrillator (S-ICD) induced by the oversensing of artefacts of chest compressions.

With this letter we would like to supplement the information in the article published in Cardiology Letters. The inappropriate shocks in the cases presented by Berkowitz et al. (2) and Cmorej et al. (3) were due to the oversensing of QRS artefacts that developed during chest compression. The S-ICD device includes a function termed Smart Pass, which reduces oversensing of lower frequency signals, such as T waves or the double counting of wide QRS complexes. The Smart Pass is automatically turned off in the case of a slow heart rate (<43 beats per minute) or a low amplitude (<0.5 mV). The main role of the Smart Pass is to decrease the risk of inappropriate treatment of fine ventricular fibrillation (2). The Smart Pass function was turned off in both presented cases of inappropriate shocks.

Cmorej et al. (1) presented that a bystander was hit by the current leakage of inappropriate shock from S-ICD. The authors were surprised by the intensity of the shock, which was also delivered to the bystander. Petley et al. (4) published a new research article in Resuscitation **Leakage current from transvenous and subcutaneous implantable cardioverter defibrillators (ICDs): a risk to the rescuer? in which it is stated that Rescuers performing chest compressions on ICD patients are at risk from leakage current, particularly from S-ICDs. Chest compressions should be performed from the opposite side to the ICD to reduce rescuer risk**. Peran et al. (5) published a letter to the editor in which the authors added information about the position of the bystander. In the case published by Cmorej et al. (3) the bystander was kneeling from the left side of the patient, where the S-ICD was located, which according to the findings of Petley et al. (4) was one of the reasons why the current leakage was so unpleasant for him. Deakin (6) replied to Peran (5) in Resuscitation **With increasing numbers of S-ICDs being implanted, we believe that this is only the first of many incidents where the rescuer may come to harm and is likely to represent a challenge in the management of cardiac arrest in S-ICD patients. It is a particular worry that S-ICDs appear to be susceptible to being triggered by CPR due to oversensing which may increase the risk to the rescuer further. Further case reports are to be encouraged in order to quantify the incidence and severity of this problem, which is likely to require addressing by S-ICD manufactures.**

With this article we would like to add some interesting information which was not mentioned in the case reported by Cmorej et al. (1) and to highlight the importance of these case reports which has provoked a discussion among professionals in the field.

References

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