Abstract: P1206
Subcutaneous ICD and elbow plank: chronicle of an inappropriate shock

Authors:
SI Llerena Butron¹, N Rivas-Gandara¹, I Roca-Luque¹, J Perez-Rodon¹, J Francisco-Pascual¹, A Santos-Ortega¹, J Rodriguez-Garcia¹, G Pascual-Gonzalez¹, H Tornos-Millet¹, L Duran-Casademont¹, A Salvador-Catalan¹, A Aguilar-Palacios¹, M Riera-Musach¹, I Gonzalez-Marquez¹, D Garcia-Dorado¹, ¹University Hospital Vall d'Hebron, Cardiology - Barcelona - Spain,

Topic(s):
Implantable Cardioverter / Defibrillator

Citation:
A 33-year-old male patient, with history of transposition of the great arteries (TGA) treated with the Senning procedure, syncope due to fast AF that derived in VF, previous EP studies with failed attempts of inducing other types of ablatable SVTs, amiodarone-induced hyperthyroidism, implantation of subcutaneous ICD in 2016, previous inappropriate shock due to fast AF, consulted because of an ICD shock while exercising.

First reviewed on remote monitoring, the episode raised suspicion of an inappropriate shock due to noise. After calling the patient and hearing that the shock happened while he was doing isometric exercises, an in-person visit was scheduled. On interrogation the device showed two episodes detected as VT, one treated with a shock and another one left untreated 12 days earlier. The patient explained that he was performing an exercise known as elbow plank (laying on tips of toes and forearms while holding the position for the maximum possible time), after approximately one minute he felt the shock, which prompted him to rest. The EGM analysis showed multiple irregular signals of low amplitude on top of sinus rhythm initially sensed as noise in both episodes, but, as it continued, the signals gained amplitude and were sensed as tachycardia. During the first episode the device didn’t deliver the shock because it was shorter, whereas in the second -and longer- episode, a 96-Ohm shock was delivered after more than 16 seconds of oversensing (Figure 1). The patient explained that during the exercise he develops tremors due to muscle fatigue, which get more intense as he tries to hold the position for longer periods of time. All electrical parameters of the S-ICD, sensing vector, and electrode impedance were normal, and there was no evidence of myopotentials on isometric testing with pushing both palms together. Since this had happened with the plank exercise we asked the patient to perform it while interrogation of the device was carried out, showing that the normal register developed irregular signals as soon as the exercise started and their disappearance as soon as it stopped, confirming the reproducibility of the artifact. After checking the other sensing vectors and testing different sensitivities of the device, the oversensing of myopotentials during this exercise could not be avoided, so we recommended exercises that don’t involve long periods of isometric effort. Inappropriate shocks due to myopotential oversensing in S-ICD are uncommon, but in some cases this can be sorted out with changes in the sensitivity and/or of the sensing vector. Given the position of the electrode, attention must be paid to the physical activity that patients perform, including the recommendation to avoid prolonged isometric exercises that involve the pectoral muscles. In this case, the characteristics of this specific exercise made it impossible to find a configuration that could avoid myopotential oversensing in a secure manner.
Abstract: P1206
Subcutaneous ICD and elbow plank: chronicle of an inappropriate shock

Authors:
SI Llerena Butron1, N Rivas-Gandara1, I Roca-Luque1, J Perez-Rodon1, J Francisco-Pascual1, A Santos-Ortega1, J Rodriguez-Garcia1, G Pascual-Gonzalez1, H Tornos-Millet1, L Duran-Casademont1, A Salvador-Catalan1, A Aguilar-Palacios1, M Riera-Musach1, I Gonzalez-Marquez1, D Garcia-Dorado1

1 University Hospital Vall d’Hebron, Cardiology - Barcelona - Spain,

Topic(s): Implantable Cardioverter/Defibrillator

Citation: A 33-year-old male patient, with history of transposition of the great arteries (TGA) treated with the Senning procedure, syncope due to fast AF that derived in VF, previous EP studies with failed attempts of inducing other types of ablatable SVTs, amiodarone-induced hyperthyroidism, implantation of subcutaneous ICD in 2016, previous inappropriate shock due to fast AF, consulted because of an ICD shock while exercising.

First reviewed on remote monitoring, the episode raised suspicion of an inappropriate shock due to noise. After calling the patient and hearing that the shock happened while he was doing isometric exercises, an in-person visit was scheduled. On interrogation the device showed two episodes detected as VT, one treated with a shock and another one left untreated 12 days earlier. The patient explained that he was performing an exercise known as elbow plank (laying on tips of toes and forearms while holding the position for the maximum possible time), after approximately one minute he felt the shock, which prompted him to rest. The EGM analysis showed multiple irregular signals of low amplitude on top of sinus rhythm initially sensed as noise in both episodes, but, as it continued, the signals gained amplitude and were sensed as tachycardia. During the first episode the device didn't deliver the shock because it was shorter, whereas in the second - and longer - episode, a 96-Ohm shock was delivered after more than 16 seconds of oversensing (Figure 1). The patient explained that during the exercise he develops tremors due to muscle fatigue, which get more intense as he tries to hold the position for longer periods of time. All electrical parameters of the S-ICD, sensing vector, and electrode impedance were normal, and there was no evidence of myopotentials on isometric testing with pushing both palms together. Since this had happened with the plank exercise we asked the patient to perform it while interrogation of the device was carried out, showing that the normal register developed irregular signals as soon as the exercise started and their disappearance as soon as it stopped, confirming the reproducibility of the artifact. After checking the other sensing vectors and testing different sensitivities of the device, the oversensing of myopotentials during this exercise could not be avoided, so we recommended exercises that don't involve long periods of isometric effort. Inappropriate shocks due to myopotential oversensing in S-ICD are uncommon, but in some cases this can be sorted out with changes in the sensitivity and/or of the sensing vector. Given the position of the electrode, attention must be paid to the physical activity that patients perform, including the recommendation to avoid prolonged isometric exercises that involve the pectoral muscles. In this case, the characteristics of this specific exercise made it impossible to find a configuration that could avoid myopotential oversensing in a secure manner.