

External defibrillation on an implantable defibrillator

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To the Editor:

Despite the best efforts of healthcare providers, guideline-conform treatment failure is expected to occur, particularly in real-world emergency situations [1]. In the case reported here, a 79-year-old man with a history of coronary artery disease and implantation of a cardioverter defibrillator (ICD) presented to the emergency room with recurrent ventricular tachycardia. The junior physician-in-charge applied an external biphasic DC shock of 200 J to the patient, holding the paddle in one hand and placing it directly over the ICD (Electronic Supplementary Material Fig. 1)—but without success. Arrhythmic stability was finally achieved by multiple, appropriate ICD shocks and intravenous amiodarone. Subsequent device interrogation and defibrillation testing of the ICD showed no instance of device malfunction. Coronary angiography revealed arteries free of significant stenoses.

Strong electromagnetic interference induced by trans-thoracic DC shocks may cause permanent damage or alter the operation of the implanted device [2]. When attempting external defibrillation, clinicians are advised to place the paddles/pads as far as possible from any pulse generator

and to choose biphasic over monophasic shock waveforms. A less deleterious effect might be expected if the orientation of the applied electric field is perpendicular—and not parallel—to the device with its lead(s), whereas if the device is located in the left pectoral region, an anterior–apex paddle position may be also acceptable. With an anterior–posterior electrode orientation and a distance between device and hand-held shock electrode of >8 cm, Manegold et al. [3] did not observe any dysfunction in patients with right- or left-sided implanted pacemakers or ICDs treated with external cardioversion for atrial fibrillation.

Conflict of interest None.

References

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