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STUDIUM PRZYPADKU / *CLINICAL VIGNETTE*

Subcutaneous cardioverter-defibrillator in a young male with heart failure and chronic kidney disease — complexity of clinical decisions in everyday practice

Podskórny kardiowerter-defibrylator u młodego mężczyzny z niewydolnością serca i niewydolnością nerek — złożoność decyzji klinicznych w codziennej praktyce

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Figure 1. Cardiac magnetic resonance images; **A.** Cine sequence showing anatomy and left ventricular systolic function; small pericardial effusion is seen; **B.** Late gadolinium enhancement (LGE) — short-axis projection; **C.** Long-axis imaging, sub-epicardial and intramuscular LGE areas particularly prominent within the ventricular septum and the posterior wall; **D.** Four-chamber projection

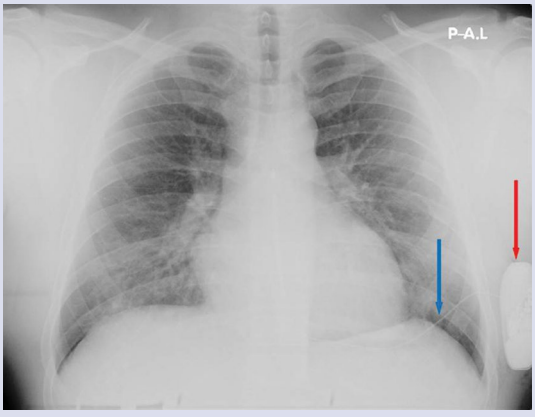

Figure 2. Chest radiograph showing proper position of device in the left lower half of the chest (red arrow) and its electrodes (blue arrow)

A 36-year-old male with poorly controlled insulin-dependent diabetes mellitus (HbA1c 8.34%) and no prior cardiac history was referred to the cardiology department due to heart failure decompensation (NYHA class IV). The patient underwent an upper respiratory tract infection three months previously. Within the following weeks worsening of exercise tolerance, shortness of breath, lower extremities, and scrotum oedema occurred. The patient consumed alcohol regularly (4–6 standard units daily) and used anabolic steroids. On admission auscultation of lungs revealed rales (Killip-Kimball II grade). Electrocardiogram record showed sinus tachycardia 120/min. There were no focal lesions in chest radiograph and heart silhouette was entirely enlarged. Laboratory tests revealed elevated, stable values of myocardial necrosis markers (troponin T 0.109 ng/mL and CK-MB 41 U/L), and elevated creatinine (2.87 mg/dL) and C-reactive protein (27.7 mg/L) concentrations as well as liver damage indices (ALT 47 U/L, AST 44 U/L, GGTP 207 U/L). Echocardiography showed enlarged heart cavities, significantly reduced left ventricular ejection fraction (LVEF 30%), and moderate mitral and tricuspid regurgitation. There were no changes in coronary angiography. Cardiac magnetic resonance suggested myocarditis (Fig. 1). Significant clinical presentation improvement was achieved. The following medications were ordered: carvedilol 2 × 25 mg, ramipril 2 × 2.5 mg, torasemide 1 × 10 mg, ivabradine 2 × 7.5 mg, as well as intensive insulinotherapy. Because there was no LVEF increase after three months the patient was qualified for implantable cardioverter-defibrillator (ICD) implantation in primary prevention. Due to chronic kidney disease (CKD), its probable future progression, and young age, implantation of a subcutaneous ICD (EMBLEM MRI S-ICD, Boston Scientific) was carried out. The periprocedural period was uncomplicated. Figure 2 shows a chest X-ray presenting the properly positioned device and its electrodes. Cardiovascular diseases are leading cause of death in patients with CKD. The number of dialysed patients with implantable cardiac devices such as pacemakers, ICDs, and resynchronisation devices, both with stimulation (CTR-P) and defibrillation function (CRT-D), has increased in recent years. More and more frequently we have to deal with such patients in everyday clinical practice. It is related with numerous technical problems and increased infectious complications. An alternative may be implantation of epicardial electrodes, but this method has not gained wide acceptance due to the necessity of sternotomy and risk of device damage. Another option for dialysed patients with indications for ICD implantation is S-ICD. This technology avoids the transvenous approach and does not require implantation of classic electrodes. S-ICD can be particularly indicated in the case of difficult venous access (e.g. central vein occlusion), for young patients who require long-term prevention, and those with increased infection risk (dialysis, immunosuppression, earlier infections). Such an approach is approved by European Society of Cardiology guidelines (Class IIb, Level C). The limitations of this approach are its higher cost and relatively little experience of implantation centres.

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