

Twisting until it breaks: A rare cause of ICD lead failure

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Abstract

We describe a rare case of Twiddler's syndrome that resulted in a complex ICD lead fracture involving both the insulation and the conductor. The conductor fracture resulted in noise artefact that was interpreted by the device as ventricular fibrillation, but the patient had not received any shocks because the "episodes" were non-sustained. The patient did not have traditional risk factors for Twiddler's syndrome. (Cardiol J 2008; 15: 558–560)

Key words: Twiddler's syndrome, ICD, lead fracture

Case report

This is the case of a 58-year-old female who presented for a routine follow-up of her implantable cardioverter-defibrillator (ICD). Upon interrogation it was noted that there were several episodes of what was classified by the device as non-sustained tachycardia. No shocks were delivered since these episodes were short-lived. The review of the tracings showed signals of non-physiological cycle lengths consistent with noise artefact. The impedance of the pace/sense portion of the lead was found to be low (187 ohms), with preserved shock impedance (42 ohms). The sensed R wave as well as capture threshold were normal. The presumed "episodes" of non-sustained tachycardia were reproduced with pocket manipulation. The patient denied experiencing any trauma that could have damaged the ICD lead or any significant change in her weight.

The current device was her original implanted system (Guidant T 1171 with Reliance 0184 lead), which was implanted 4 years ago for the primary prophylaxis of sudden cardiac death. Although pocket irregularities were evident on palpation, it was

assumed that a complex insulation and conductor fracture of the lead was present. There was adequate tissue, with some degree of laxity surrounding the ICD generator without excessive tissue redundancy. A chest X-ray was ordered to identify the site of the lead fracture. Review of the x-ray revealed a very tortuous "twiddled" ICD lead (Fig. 1, 2). After appropriately counselling the patient and her family of the deleterious effect of pocket manipulation it was decided to proceed with a system revision and insertion of a new ventricular ICD lead.

Surgical exposure of the pocket uncovered a defibrillator lead with multiple twists and grossly visible cracks in the insulation. The lead was capped and another defibrillation lead was inserted (Fig. 3). The ICD generator was also moved from a subcutaneous to subpectoral pocket.

Discussion

Twiddler's syndrome was first described in the 1960s and involved a patient who had undergone the insertion of a permanent pacemaker [1]. To date Twiddler's syndrome remains an unusual occurrence and is very infrequently reported in patients with

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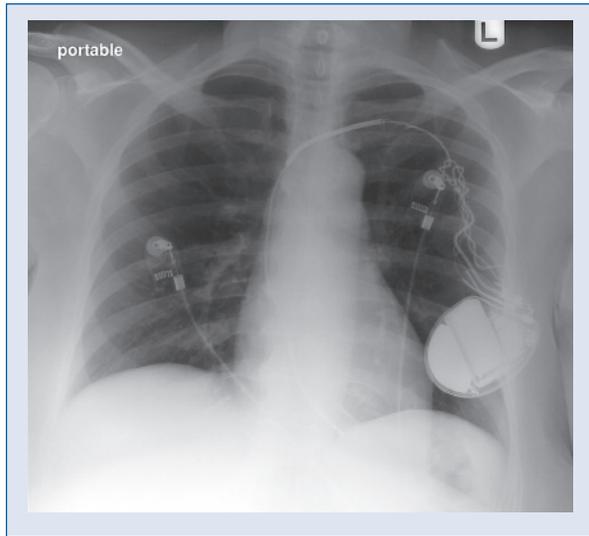


Figure 1. Preoperative chest X-ray showing severe twisting of the ICD lead as well as non-existent slack.

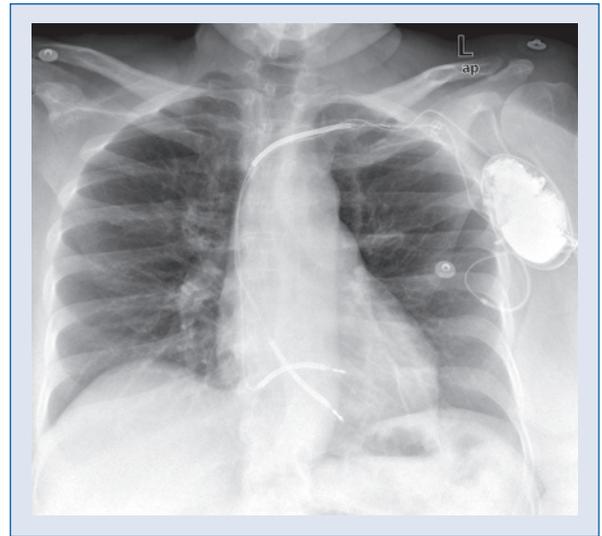


Figure 3. Postoperative chest X-ray showing new defibrillation lead in place.

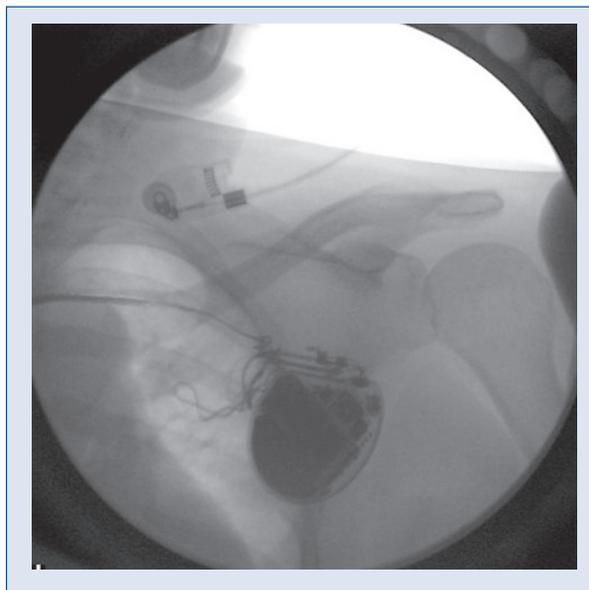


Figure 2. Intraoperative fluoroscopy image showing dramatic excursion of the ICD generator with a change of body position.

ICDs [2]. The larger size of the ICD generator clearly impedes twiddling. Nevertheless, Twiddler's syndrome was described even in a patient with a subpectoral pocket [2]. Several factors have been described as risk factors for twiddling. These include weight loss, generator change to a smaller device and psychiatric disease [3]. Our patient did not have a prior history of psychiatric disease or significant weight loss but the subcutaneous tissue

did manifest a certain degree of laxity. This was evident when the preprocedural chest X-ray was compared to the original fluoroscopic images obtained during the lead revision, revealing a dramatic excursion of the generator over the chest wall. This was thought to be the predisposing factor for our patient.

Twiddling can result in lead fracture, as in our case, leading to inappropriate discharges, or migration of the lead and extremely unusual symptoms related to lead migration (hiccups, dystonic voice) [4–7]. Fortunately, in this patient, the noise artefact detected was of short enough duration and did not result in an inappropriate ICD discharge.

This patient was counselled about the risks of pocket manipulation. The patient has now been followed carefully for 9 months without any evidence of a change in the status of the pocket or lead function. Since this was the patient's original device, system tissue laxity and not an underlying psychiatric disorder was felt to be the risk factor resulting in twiddling of the ICD lead.

This case underscores the importance of considering Twiddler's syndrome in a patient with a newly diagnosed lead fracture. Patients should be counselled as to the risks of pocket manipulation. Other factors such as weight change and pocket laxity should be considered when screening for this syndrome.

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