Pacemaker Reel Syndrome — A Rare Cause of Pacemaker Malfunction

Gurkirat Singh*, Hemant Khemani, Zahidullah Khan, Vikrant Deshmukh, and Narender Bansal
Department of Cardiology, Grant Medical College and Sir J.J group of hospitals, India

Abstract
Reel syndrome is a very rare cause of pacemaker malfunction. “Reel syndrome” has been described as a variant of twiddler’s syndrome, characterized by reeling-in of the pacemaker lead. It occurs due to the rotation of the pulse generator on its transverse axis with subsequent coiling of the pacemaker leads around the pulse generator, resulting in dislodgement and/or retraction of the pacing lead with loss of pacing function. We report a case of Reel syndrome with a single chamber pacemaker, in which an actively fixated ventricular lead was coiled around the generator.

INTRODUCTION
“Reel syndrome” is a rare variant of twiddler’s syndrome, characterized by reeling-in of the pacemaker lead(s) [1]. Reel syndrome is a rare cause of an implantable device malfunctioning [2]. It occurs due to the rotation of pulse generator on its transverse axis with subsequent coiling of the pacemaker leads around the pulse generator, resulting in dislodgement and/or retraction of the pacing lead [3]. Twiddler’s syndrome is characterized by the coiling of the pacemaker lead due to the rotation of the pacemaker generator on its longitudinal axis [4]. We report a case of 64-year-old female with single chamber pacemaker, who presented with one episode of syncope and twitching in the right upper quadrant of the abdomen after 48 hours of implantation and was subsequently diagnosed as having Reel syndrome, in which an actively fixated ventricular lead was encircled around the generator and retracted back into the right atrium.

CASE PRESENTATION
A 64-year-old female, hypertensive since 15 years was admitted with recurrent episodes of syncope. On examination pulse was 38 per minute, blood pressure was 150/90 mmHg. Cardiovascular and respiratory examinations were normal. Electrocardiogram showed atrial fibrillation with a fixed ventricular rate of 38/minute. Echocardiogram showed mild concentric hypertrophy, dilated left atrium with the volume of 42 ml and an ejection fraction of 60%. Anti-hypertensive medications were reviewed. Routine blood investigations were normal. All reversible causes of the present condition were ruled out. A single chamber permanent pacemaker (VVIR - ventricular pacing, ventricular sensing, inhibiting mode, and rate response function) was implanted in the right infra-clavicular area. A bipolar active fixating lead was placed at the right ventricular apex. The pulse generator was also fixed to the underlying pectoral muscle with non-absorbable suture. Measured ventricular lead R wave, the threshold, and lead impedance were 14 mV, 0.5 V, and 750 ohms, respectively. Postoperative fluoroscopic images confirmed the satisfactory positioning of ventricular lead. The pacemaker implantation procedure was uneventful. After 48 hours of the procedure, patient had one episode of syncope and twitching in the right upper quadrant of the abdomen. Electrocardiogram showed atrial fibrillation with a ventricular rate of 34/minute. Patient was shifted to the cath lab. Temporary pacemaker lead was inserted through the right femoral route. Fluoroscopy showed encircling of ventricular lead around the generator and its retraction into the right atrium (Figures 1, 2). A diagnosis of pacemaker Reel syndrome was made. Under all aseptic precautions, the pacemaker pocket was immediately reopened. The lead was repositioned at the right ventricular apex. The parameters were checked; R wave, the threshold, and lead impedance were 13 mV, 0.4 V, and 650 ohms, respectively. The pulse-generator was fixed on the pectoral muscle with non-absorbable suture. Postoperative fluoroscopic images confirmed the satisfactory positioning of ventricular lead (Figure 3). Post-procedure electrocardiogram is shown in Figure D. Postoperative hospital stay was uneventful and the patient was asymptomatic at subsequent follow-ups.

DISCUSSION
Reel syndrome is commonly included in the macrodislocation-lead-dysfunctioning syndromes along with Twiddler’s and Ratchet syndromes. Dislodgement of pacing leads is a well-known complication of device implantation. Macro-
Patients either present with syncope, pre-syncope due to bradycardia or with twitching in the right upper quadrant of the abdomen due to the phrenic nerve stimulation or rhythmic arm twitching due to stimulation of the brachial plexus. Our patient presented with one episode of syncope and twitching in the right upper quadrant of the abdomen. Diagnosis is straightforward with easily available ECG and Chest X-Ray/Fluoroscopy, which also differentiate between these syndromes.

Reel syndrome usually occurs within a month of implantation and there is no damage to the leads. There is no need of pacemaker lead change in Reel syndrome, unlike in Twiddler’s syndrome where the leads are usually damaged and their replacement is mandatory. Our patient presented after 48 hours of the procedure. Management always requires reopening the pocket, repositioning of the leads into their respective positions, fixation of the sleeves and pacemaker generator to the pectoral fascia/muscle. This increases the duration of hospital stay and cost. Preparing an adequate pocket, suturing lead sleeves at least with 2 separate tight sutures, and suturing the generator to the fascia

dislocation lead-dysfunctioning syndromes differ from each other in the causing mechanism. Twiddler’s syndrome is caused by retraction and dislocation of the electrodes due to rotation of the generator around the longitudinal axis. Ratchet syndrome is caused by retraction and electrode dislocation with ratcheting but without coiling of the generator due to the progressive displacement of the electrodes from their fixing protections [5]. Reel syndrome occurs due to the rotation of permanent pacemaker on its transverse axis with subsequent coiling of the pacemaker leads around the pulse generator. When only one of the leads get retracted or displaced in dual chamber pacemakers, this phenomenon is called ‘Selective REEL syndrome’ [6]. These are potentially life-threatening complication in pacemaker-dependent patients and leads to failure of the defibrillator to terminate ventricular tachycardia/fibrillation. These syndromes have similar etiologies. Female gender, pediatric age, elderly, large pacemaker pocket, obesity/thick subcutaneous tissue, impaired cognition and conscious or unconscious manipulation of the pacemaker pocket are contributing factors. The presenting symptoms, method of diagnosis, and treatment are the same.
are as important as lead placement in preventing Reel syndrome. The education of the patient and their family members about the life with implantable devices is as important as the implantation of the device.

CONCLUSION

Reel syndrome is a rare cause of an implantable device malfunctioning, with potentially catastrophic consequences. Diagnosis is easily made by chest radiograph. Suturing leads firmly to the suture sleeve, underlying fascia/muscle and suturing the generator to the fascia, inside the pocket, can prevent this.

REFERENCES