

## Early development of pacemaker Reel syndrome in an elderly patient with cognitive impairment

Bilinci bozuk, yaşlı bir hastada erken dönemde kalp pilinde gelişen Reel sendromu

Farid Aliyev, M.D., Cengiz Çeliker, M.D., Cengizhan Türkoğlu, M.D., Fatma Nihan Turhan, M.D.

Department of Cardiology, Division of Pacing and Electrophysiology, İstanbul University Institute of Cardiology, İstanbul

Reel syndrome is a rare form of Twiddler's syndrome and is characterized by rotation of permanent pacemaker on its transverse axis and rolling of the electrode around the generator. An 83-year-old man with severely impaired mental status, agitation, and uncontrolled movement of extremities underwent pacemaker implantation for symptomatic atrial fibrillation. The pacemaker generator was fixed to the pectoral fascia with nonabsorbable ligatures. On the next day, failure to capture the ventricle was noted. Fluoroscopic examination showed coiling of the electrode around the generator. During urgent intervention, the ligature of the generator was observed to be released from the pectoral fascia. The pacemaker lead was not damaged; therefore, the same lead was re-implanted, connected to the generator, and carefully fixed to the pectoral fascia. The patient showed rapid clinical improvement together with his mental status. No abnormality was detected during three months of follow-up. Patients with impaired consciousness, children, and older persons require a close follow-up because of their propensity to this serious and life-threatening complication.

**Key words:** Atrial fibrillation/therapy; electrodes, implanted; equipment failure; pacemaker, artificial.

Reel syndrome is a rare variant of Twiddler's syndrome and is characterized by rotation of permanent pacemaker on its transverse axis with rolling of the electrode around the generator.<sup>[1]</sup> It has been reported in patients with single- and dual-chamber pacemakers.<sup>[1,2]</sup> The final result is displacement of the lead and failure of ventricular and/or atrial capture.

### CASE REPORT

An 83-year-old man was referred to our hospital for pacemaker implantation due to symptomatic atrial fibrillation with a slow ventricular rate. On admis-

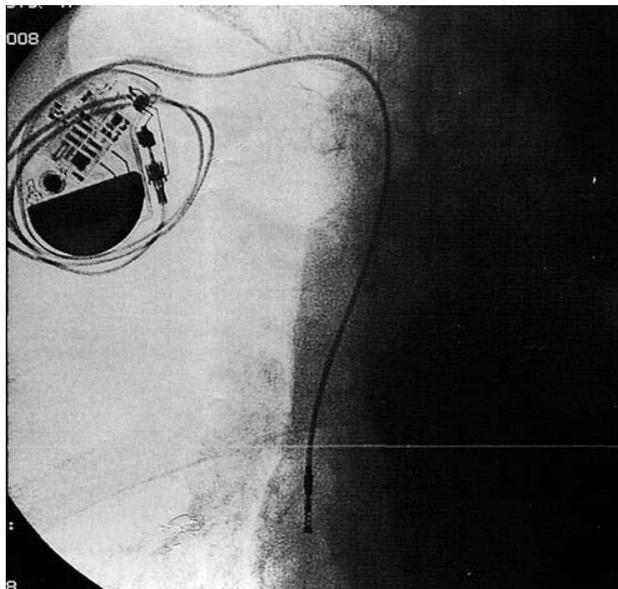
Reel sendromu Twiddler sendromunun nadir bir türüdür. Kalıcı kalp pilinin transvers eksen etrafında dönmesi ve elektrodun jeneratör çevresinde dolanması ile oluşur. Bilinci kapalı, ajitasyon halinde ve ekstremitelerinde kontrolsüz hareketler olan 83 yaşındaki bir erkek hastaya, semptomatik atriyum fibrilasyonu nedeniyle kalp pili takıldı. Kalp pilinin jeneratörü emilmeyen iplikle pektoral fasyaya sabitlendi. İşlemin ertesi gününde, pilin ventrikül fonksiyonunun çalışmadığı gözlemlendi. Floroskopik incelemede elektrodun jeneratör çevresine dolandığı görüldü. Onarım için yapılan acil girişimde, jeneratörü pektoral fasyada tutan ipliğin çözüldüğü izlendi. Hasar görmemiş olan aynı elektrot teli yeniden yerleştirilip jeneratöre bağlandı ve dikkatli bir şekilde pektoral fasyaya yeniden sabitlendi. İşlem sonrasında hastanın klinik durumu bilinç durumuyla birlikte hızlı bir düzelme gösterdi. Hastanın üç aylık takibi sırasında başka bir sorun görülmedi. Bilinç bozukluğu olan hastalar, çocuk ve yaşlılar bu ciddi ve yaşamı tehdit eden komplikasyona açık olduklarından, bu tür hastaların yakından takip edilmesi gerekir.

**Anahtar sözcükler:** Atriyum fibrilasyonu/tedavi; elektrot yerleştirme; ekipman başarısızlığı; kalp pili.

sion, he had severely impaired mental status, agitation with uncontrolled movement of extremities, a relatively regular pulse at a rate of 20-25 beats/min, and systolic blood pressure of 60 mmHg. Blood biochemistry revealed extremely high levels of hepatic enzymes, with alanine aminotransferase and aspartate aminotransferase values exceeding 1,500 IU/ml, and moderately impaired renal function. His international normalized ratio (INR) was 2.5. A temporary transvenous pacemaker lead was introduced via the right femoral vein. During the following 12 hours, 7.5 mg of vitamin K was administered and a perma-

Received: January 4, 2009 Accepted: March 17, 2009

Correspondence: Dr. Farid Aliyev. İstanbul Üniversitesi Kardiyoloji Enstitüsü, Kardiyoloji Anabilim Dalı, 34034 Haseki, İstanbul, Turkey. Tel: +90 212 - 459 20 00 / 29522 e-mail: drfaridaliyev@yahoo.com.tr



**Figure 1.** Encircling of the pacemaker electrode around the pulse generator. The tip of the electrode is located at the right atrium-superior vena cava junction. Active screw is also withdrawn into the distal tip, which is probably due to direct manipulation of the lead.

ment transvenous pacemaker (VVI mode, Zephyr, St. Jude Medical, CA, USA) was successfully implanted with an active-fixation screw-in ventricular electrode. During the procedure, the pacemaker generator and sleeve surrounding the electrode was fixed to the pectoral fascia with nonabsorbable ligatures.

On the next day, routine ECG examination revealed a heart rate of about 30 beats/min and failure to capture the ventricle. Fluoroscopic examination showed coiling of the electrode around the generator with displacement of its tip to the right atrium-superior vena cava junction (Fig. 1). A subsequent operation was performed immediately and the ligature of the pulse generator was observed to be released from the pectoral fascia. The pacemaker lead was not damaged; therefore, the same lead was re-implanted, connected to the generator, and carefully fixed to the pectoral fascia. Agitation of the patient and uncontrolled movement of extremities were taken under control with low dose haloperidol and stabilization of upper extremities. The patient showed rapid clinical improvement during the subsequent two days. His mental status

showed considerable improvement, liver enzyme levels significantly decreased, and he was discharged on the fifth postprocedural day. No abnormality was detected during three months of follow-up.

## DISCUSSION

Twiddler's and Reel syndrome both have similar etiologies. Female gender, large pacemaker pocket, obesity/thick subcutaneous tissue, and controlled or uncontrolled manipulation of the pacemaker pocket can be listed as contributing factors.

This has been the only case of Reel syndrome observed at our institution. We also have not encountered any case of Twiddler's syndrome. The average annual number of device implantation procedures at our pacemaker and electrophysiology division ranges between 200 and 250. We prefer to fix the pulse generator and sleeve surrounding the lead to the pectoral fascia with nonabsorbable ligatures in all the patients undergoing pacemaker implantation, although some authors prefer to remain the pulse generator free in the pocket without fixation. We believe that tight ligature of the generator and sleeves surrounding the electrode is the main factor responsible for the absence of such a complication in our patients. In a conscious patient, disruption of this suture will be very painful and thus no patient will try to rotate the generator in this condition. A tight suture will also prevent free movements of the generator within the pocket. Our patient was unconscious, that is why he could easily rotate the device.

Finally, we emphasize the importance of close follow-up of patients with impaired consciousness, children and older persons, who are prone to this serious and life-threatening complication.

## REFERENCES

1. Carnero-Varo A, Pérez-Paredes M, Ruiz-Ros JA, Giménez-Cervantes D, Martínez-Corbalán FR, Cubero-López T, et al. "Reel Syndrome": a new form of Twiddler's syndrome? *Circulation* 1999;100:e45-6.
2. Vural A, Ağaçdiken A, Ural D, Komsuoğlu B. İki odacıklı kalp pili bulunan bir olguda "Reel sendromu" ve pulzatil karaciğer. *Türk Kardiyol Dern Arş* 2003;31:117-20.