

## Imaging in Cardiology – Pacemaker Twiddler's Syndrome Leading to Atrial Screw-in Lead Dislocation

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### Summary

*A permanent DDD pacemaker was implanted with an atrial screw-in lead and a passive fixation ventricular lead in a 73 year-old female patient to cure symptomatic 2:1 atrioventricular block, exertional dyspnea, dizziness, and near-syncopal episodes. The patient developed pacemaker Twiddler's syndrome 1.5 years after pacemaker implantation. She was readmitted to the hospital due to recurrent presyncopal episodes and dyspnea. Chest radiography revealed that the atrial lead and the pulse generator had been displaced. A new active fixation lead was implanted in the atrium, which restored AV-synchrony and relieved symptoms.*

### Key Words

Twiddler's syndrome, active fixation lead

### Introduction

The Twiddler's syndrome is a complication of pacemaker or cardioverter-defibrillator implantation, usually occurring when the device is implanted in a relatively large pacemaker pocket. It is characterized by spontaneous, inadvertent or deliberate rotation of the implanted device under the skin, causing dislodgment or fracture of a pacemaker lead connected to the pacemaker. We present a case of the pacemaker Twiddler's syndrome where a spontaneous pulse generator rotation (twisting, counterclockwise rotation) caused atrial screw-in lead dislodgement.

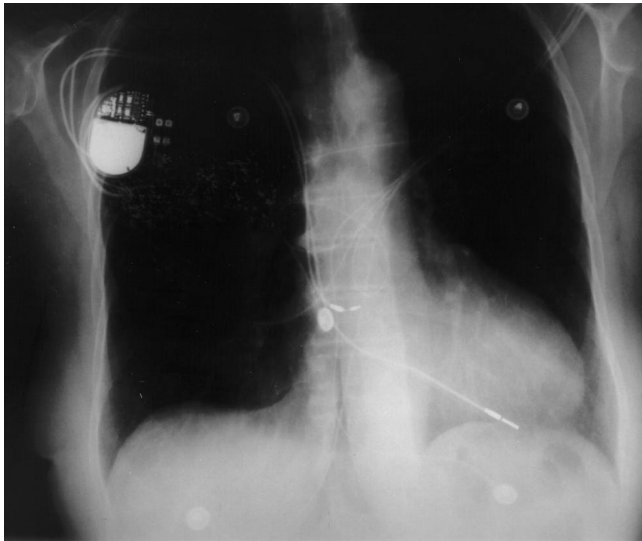
### Case Report

A 73 year-old female patient was implanted with a permanent DDD pacemaker on January 25, 1997, to cure symptomatic 2:1 atrioventricular block, exertional dyspnea, dizziness, and near-syncopal episodes. During implantation, an atrial screw-in lead was introduced via the right cephalic vein into the right atrium and a passive fixation ventricular lead was positioned into the right ventricular apex (Figures 1a and 1b). The

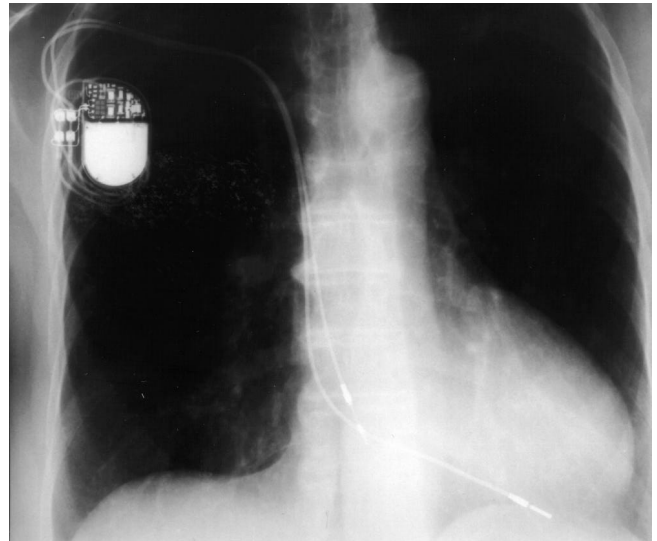
pacemaker pocket was generated in the right pectoral subcutaneous region without peri-procedural complications. During initial follow-up, the pacemaker functioned properly and the patient was free of syncopal episodes. When asked to describe any feeling/event perceived in relation to the implanted pacemaker, the patient explained that the generator occasionally "stood up" in the pocket, but she felt comfortable with such pacemaker behavior.

One and a half years later, in the outpatient clinic she complained renewed symptoms of dyspnea and recurrent presyncopal episodes. The complaints came just after she turned around in bed; at this precise moment she felt that the pulse generator had flipped over again, which was followed by a small snap and dyspnea. The ECG evaluation revealed a complete heart block with a loss of atrioventricular synchrony. Atrial pulses did not capture, suggesting atrial lead dislodgement. Ventricular pulses were followed by normal depolarizations.

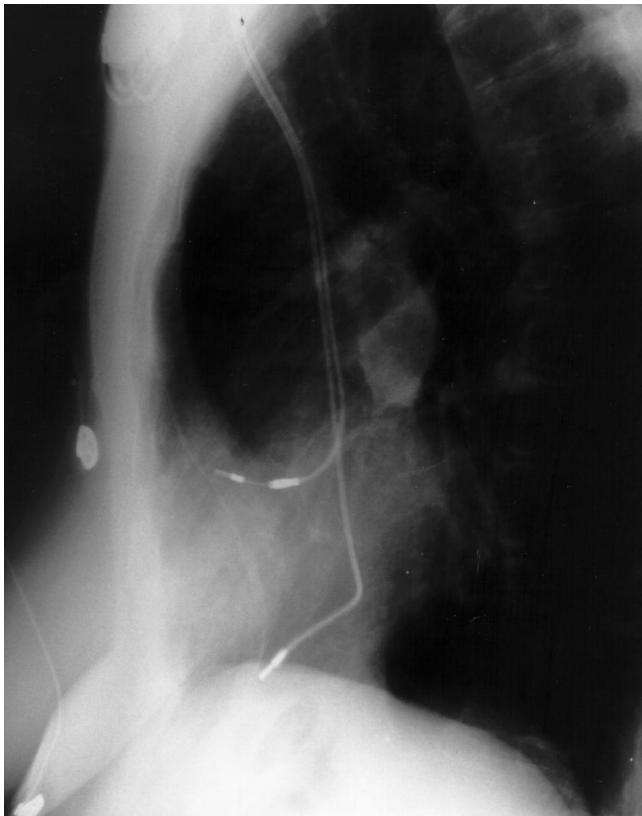
Chest radiography revealed that the pulse generator had turned counterclockwise around its vertical axis, with the atrial lead being displaced and floating within



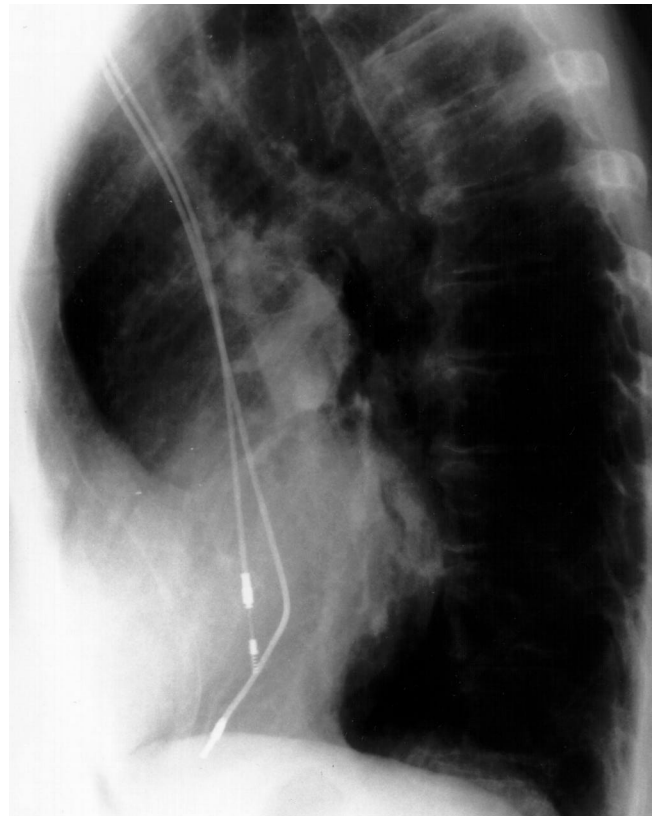
a



a



b



b

*Figure 1. a) Postoperative X-ray on January 25, 1997 (anterior-posterior view).*

*b) Postoperative X-ray (lateral view).*

*Figure 2. a) Pre-revision X-ray on May 14, 1998 (anterior-posterior view).*

*b) Pre-revision X-ray (lateral view).*

the atrium (Figures 2a and 2b). During the reintervention, the atrial lead was extracted and a new active fixation lead implanted to restore pacing system function.

Following the reoperation, the system functioned free of any adverse effect for more than one year and the symptoms have been completely relieved.

## Discussion

The Twiddler's syndrome, first described by Bayliss et al. in 1968 [1], occurs when patients cause pacemaker malfunction by intentional or unintentional "twiddling" of the pulse generator, leading to pacemaker lead dislodgment or dysfunction [2]. The phenomenon has even been reported in children, but has rarely occurred in active fixation leads as exemplified by our patient [3]. A large pocket or loose subcutaneous tissue may facilitate manipulation of the pacemaker, which occurs most frequently in elderly women [5]. Patients may deny fidgeting with the pulse generator. The key to diagnosis is to perform chest X-ray evaluation in order to observe twisting or coiling of the lead(s) around the pacemaker axis and possible lead fracture, displacement, migration, or rotation of the pulse generator itself. Treatment consists of surgical correction of the pacing system and usually of the pocket itself. In our patient, a pouch was used to prevent repetition of the Twiddler's syndrome.

## References

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