

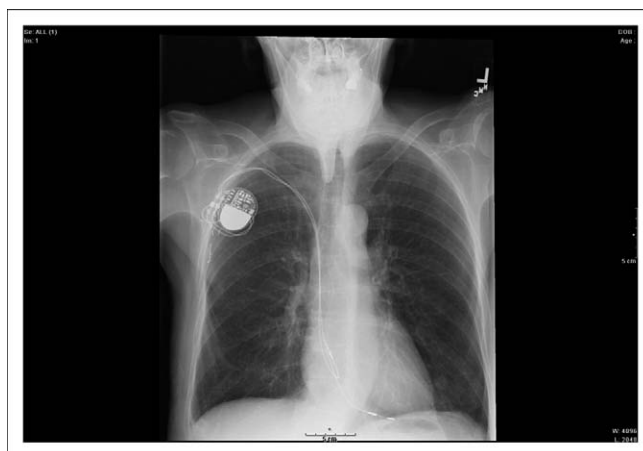
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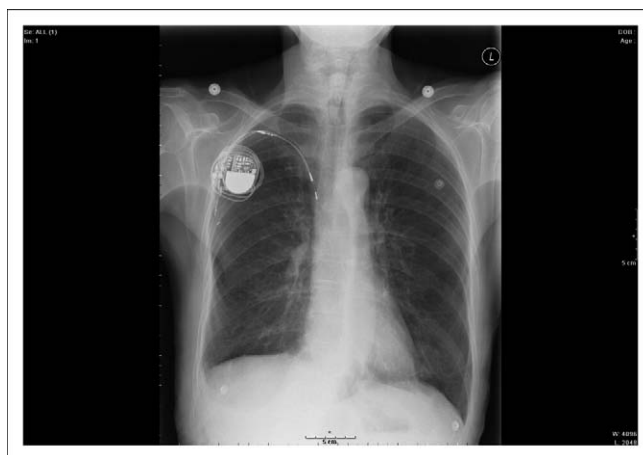
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**Figure 1.** Chest radiograph immediately after pacemaker placement showing normal position of pacemaker leads.



**Figure 2.** Chest radiograph 2 months after placement showing the pacemaker leads reeled around pulse generator. Used with permission of Benjamin P. Davis, MD, Department of Emergency Medicine, Carle Foundation Hospital, University of Illinois College of Medicine, Urbana, IL.

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An 85-year-old woman presented with right arm twitching. She had a history of Alzheimer's dementia and is a resident at a skilled nursing facility. That morning at breakfast, the nursing home staff noticed rhythmic twitching of her right upper extremity while she tried to hold her fork. She had a pacemaker implanted for sick sinus syndrome 2 months before this visit (Figure 1). She denied complaints. She specifically denied any problems related to her pacemaker. An ECG showed normal sinus rhythm without any active pacing.

*For the diagnosis and teaching points, see page 483.*

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to the right ventricle. As the physician who performed the procedure, I am quite confident that there was no damage to the ventricle. Real-time ultrasound guidance was used and the introducer needle was visualized throughout the entire procedure, as was the wire entering the pericardial space. At no time was the needle close to the ventricle, let alone going through the right ventricle wall to injure the endocardium, as would be necessary to be a thrombogenic nidus. Additionally, the autopsy showed no ventricular injury. The timing of the thrombus in relation to the drug administration deserves mention. The prothrombin complex concentrate and desmopressin were both injected through a right-sided external jugular vein during a time of critical tamponade physiology and bradycardia. It is unlikely that there was any significant systemic circulation of these medications given the patient's tamponade physiology. It is also likely that the medications were concentrated in the venous collecting system due to high right ventricular filling pressures and collapse of the right ventricle. We postulate that this was why the INR drawn later did not correct and that a large thrombus formed in the right ventricle only upon relieving the pericardial tamponade. While prothrombin complex concentrates are *probably* safe, no large or randomized study has been done comparing prothrombin complex concentrates to fresh frozen plasma. This case represents a unique physiology and rare ventricular thrombus

associated with the use of prothrombin complex concentrate and desmopressin. While this case suggests caution in administration of these medications, particularly in combination, it should not change current practice.

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1. Warren O, Simon B. Massive, fatal, intracardiac thrombosis associated with prothrombin complex concentrate. *Ann Emerg Med.* 2009;53:758-761.
2. Crescenzi G, Landoni G, Biondi-Zoccai G, et al. Desmopressin reduces transfusion needs after surgery. *Anesthesiology.* 2008; 109:1063-1076.

## IMAGES IN EMERGENCY MEDICINE

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### DIAGNOSIS:

*Twiddler's syndrome.* Twiddler's syndrome occurs when the patient deliberately or subconsciously spins the pacemaker generator within its pocket. The pacemaker leads are subsequently dislodged from the myocardium and ventricular pacing ceases. As the leads are continually reeled around the pulse generator, unintended pacing of nerves may occur (Figure 2). The phrenic nerve may be stimulated, resulting in diaphragmatic pacing and the sensation of abdominal pulsations. With further twirling, the brachial plexus may be stimulated, as in this case, causing rhythmic arm twitching.<sup>1</sup> Risk factors include obesity, older age, female sex, and especially dementia.<sup>2</sup> Treatment involves creating a smaller pocket for the pacemaker, suturing the device to the fascia, and placement of the pacemaker deep in the pectoralis muscle.<sup>3</sup>

### REFERENCES

1. Nicholson WJ, Tuohy KA, Tiikemeier P. Twiddler's syndrome. *N Engl J Med.* 2003;34:1726-1727.
2. Harel G, Georgeta E, Copperman Y. Twiddler's syndrome: a rare cause of pacemaker failure. *Isr Med Assoc J.* 2008;10: 160-161.
3. Riezebos RK, de Ruiters GS. Twiddler's syndrome: an unusual cause of pacemaker dysfunction. *Am J Geriatr Cardiol.* 2008;17:53-54.