



## Clinical Communications: Adults



### NECK PAIN ONE WEEK AFTER PACEMAKER GENERATOR REPLACEMENT

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**Abstract—Background:** The incidence of cardiac pacemaker implantation has risen markedly in the past three decades, making awareness of possible postprocedural complications critical to the emergency physician. This case is the first documented instance of internal jugular (IJ) deep vein thrombosis (DVT) from an uncomplicated pacemaker generator replacement. **Case Report:** A patient presented to an Emergency Department with a 2-day history of mild left temporal headache migrating to his left neck. The patient did not volunteer this information, but review of systems revealed a temporary transvenous pacemaker inserted through the right IJ vein 1 week previously during a routine exchange of a left-sided cardiac pacemaker generator. Manipulation of the existing pacemaker wires entering the left subclavian vein was minimal. Computed tomographic angiography of the neck demonstrated near-complete thrombotic occlusion of the entire length of his left IJ vein. This required hospital admission for observation and treatment with anticoagulation. **Why Should An Emergency Physician Be Aware Of This?:** DVT, with thrombotic extension into adjacent vessels anywhere along the course of pacemaker wires, should be considered by the emergency provider in the evaluation of head, neck, or upper extremity symptoms after recent or remote implantation or mani-

pulation of a transvenous cardiac pacemaker, including generator replacement. Failure to identify and treat appropriately could result in significant morbidity and mortality from airway edema, septic thrombophlebitis, superior vena cava syndrome, superior sagittal sinus thrombosis, or pulmonary embolism. Published by Elsevier Inc.

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#### INTRODUCTION

The increasing incidence of cardiac pacemaker implantation, rising from 36 to 99 per 100,000 person-years from 1975–1979 to 2000–2004, makes awareness of possible postprocedural complications critical to the emergency physician (1). Deep venous thrombosis (DVT) originating along the intravenous course of the leads is an uncommon event, with most cases occurring shortly after implantation, though it has been reported as long as 7 years later (2). Though rare, it has been suggested that internal jugular (IJ) thrombosis has morbidity and mortality rates comparable to those of subclavian and axillary DVTs and should be treated as aggressively (3). We present the case of a patient who had minimal complaints, yet computed tomographic (CT) angiography identified a large DVT from the left brachiocephalic vein to the left sigmoid sinus.

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## CASE REPORT

A 67-year-old Caucasian man presented with approximately 48 hours of left-sided neck pain, which began as a left-sided temporal headache that had migrated inferiorly from just anterior to the left ear down to the left clavicle. The patient stated the pain was “mild,” but rated it as 6/10. He described the discomfort as a “twinge” in the neck—sharp with movement of the head and neck, dull when still, and exacerbated when he coughed. He also remarked on mild left eye lacrimation, mild left-sided sinus congestion, and a mild sore throat.

The patient denied any direct head or neck trauma, or violent neck motions. Aside from an occasional nonproductive cough that occurred only a few times a day, he did not admit to other respiratory infection-like symptoms, facial pain, postnasal drip, problems swallowing, change in voice, noisy breathing, shortness of breath, or chest pain. No fever, chills, lightheadedness, weight loss, or other constitutional symptoms could be identified. He had no visual changes, focal neurological complaints, or problems with speech, balance, or gait.

Past medical history and medications were not pertinent except for aspirin for cardiac risk reduction. When the patient was queried about his past surgical history, he noted an indwelling left-sided transvenous dual-lead pacemaker placed many years previously for third-degree atrioventricular conduction block, which he did not originally mention. The patient also reported replacement of the pacemaker generator 1 week prior to his Emergency Department (ED) presentation. Additionally, that recent procedure necessitated placement of a temporary transvenous pacemaker through the right IJ vein while the generator was exchanged. The patient had completed an appropriate 5-day course of prophylactic antibiotics after the procedure. The patient denied any personal or family history of DVT, pulmonary embolism (PE), malignancy, and any other known risk factors for venous thromboembolic disease.

The patient’s vital signs and visual acuity were within normal ranges. Mild palpebral injection of the left conjunctiva was noted, but the remainders of the ocular and orbital examinations were normal, including measurements of intraocular pressures. His temporal arteries were nontender. He had mild pharyngeal erythema without exudates or cervical lymphadenopathy. There was no obvious pharyngeal edema, and his uvula was in the midline. No significant swelling of the patient’s head or neck could be appreciated or neck mass palpated. He was mildly tender to palpation along the sternocleidomastoid muscle from the left mastoid to the left clavicle, but not tender in the carotid sulcus. There was no palpable cord along the deep venous system. The pacemaker incision on his chest was clean, dry, and intact, with no evidence of superficial or deep infection. The remainder of his physical examination, including a detailed neurological examination, was unremarkable.

Posterior-anterior and lateral plain chest radiographs demonstrated intact pacemaker wires extending from a left-sided generator, but no obvious acute pathological abnormality. CT angiography of the neck revealed pacemaker leads entering the left subclavian vein. A near-complete filling defect of the central left venous system extended from the left sigmoid sinus through the entire IJ vein into the left brachiocephalic vein, consistent with an acutely formed thrombus (Figure 1).

A bacterial etiology, possibly leading to septic thrombophlebitis (i.e., Lemierre syndrome) was felt to be unlikely, so the patient was not started on intravenous (i.v.) antibiotics. Preadmission 12-lead electrocardiogram and routine laboratory studies were all normal. After discussion of the case with the on-call cardiologist, enoxaparin 1 mg/kg was administered subcutaneously in the ED, and the patient was admitted to the medical ward for observation due to the potential for life-threatening airway, cardiovascular, or neurological complications. The patient’s inpatient stay was unremarkable, and he was discharged 5 days later on warfarin therapy with dalteparin bridging.



Figure 1. Computed tomographic angiography showing near-complete occlusion of the left internal jugular vein.

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