

This material is protected by U.S. copyright law. Unauthorized reproduction is prohibited.  
To purchase quantity reprints or request permission to reproduce multiple copies, please e-mail [reprints@ons.org](mailto:reprints@ons.org).

# Thromboembolic Disorders in Cancer

Ruth Van Gerpen, RN, MS, OCN®, and Merle E. Mast, PhD, RN, ANP

**T**hrombosis is a major complication of cancer. Multiple precipitating factors, including tumor procoagulants, cancer treatment with surgery and chemotherapy, and immobility, contribute to its incidence. Understanding the etiology, clinical manifestations, diagnostic tests, and interventions for prevention and treatment is important for oncology nurses providing care to this complex group of patients.

## Case Study

M.J., age 62, presented to the emergency department with complaints of shortness of breath without chest pain that was exacerbated with exertion but unrelieved by rest or analgesics. She also noticed some increasing ecchymosis in her left foot over the past few weeks with no history of injury. M.J. was taking warfarin after being diagnosed two months earlier with extensive deep vein thrombosis (DVT) of her left lower extremity. On examination, she had 2+ pitting edema in the left lower extremity extending from the foot to the knee and fairly extensive ecchymosis over her left lateral foot. Her breath sounds were clear but diminished in the lower lobes with an oxygen saturation of 94% on room air. A computed tomography (CT) pulmonary angiogram revealed extensive pulmonary emboli (PE) that involved the left and right lower lobes. Her D-dimer assay was markedly elevated at greater than 2,000, and her international normalized ratio (INR) was 2.7. Cardiac enzymes were normal. Additional laboratory tests revealed a hemoglobin of 10 g/dl and platelet count of 124,000/mm<sup>3</sup>.

Anticoagulation therapy was initiated with enoxaparin sodium (Lovenox®, Aventis Pharmaceuticals, Bridgewater, NJ) 1 mg/kg

Complex factors, including substances in cancer cells, cancer treatment effects, and venous stasis associated with chronic illness, blood vessel wall injury, and immobility, interact to place patients with cancer at risk for thrombosis. This article describes the etiology, clinical manifestations, diagnostic tests, and treatments for venous and pulmonary emboli associated with cancer. It explores the nurse's role in assessing patients who are at risk, managing symptomatic thrombosis and primary and secondary prevention of emboli, and administering anticoagulant therapy. As growing numbers of patients are treated in outpatient settings, oncology nurses play a critical role in the coordination of care for patients at risk for thrombosis. A nursing care plan summarizes key nursing strategies for assessment and intervention.

**Key Words:** neoplasms, venous thrombosis, anticoagulants

subcutaneously every 12 hours, and an inferior vena cava (IVC) filter was inserted to prevent further thrombus embolization following reversal of the INR with vitamin K. Because the hypercoagulable state suggested the possibility of an underlying malignancy, her physician initiated further evaluation. Test results for the factor V Leiden and the prothrombin gene mutations were negative, and the homocysteine level was normal. However, the carcinoembryonic antigen was 81.3 U/ml (normal is less than 2.5 U/ml) and the CA-125 was 3,525 U/ml (normal is less than 35 U/ml). Cytologic evaluation of her peritoneal and pleural fluid confirmed a diagnosis of metastatic ovarian cancer, and she began chemotherapy with paclitaxel and carboplatin. The unexpected diagnosis of advanced cancer in addition to her PE heightened the anxiety that M.J., her husband, and her two children experienced. Essential components of M.J.'s nursing care included ongoing emotional and spiritual support and information regarding tests and treatment.

Despite ongoing anticoagulation therapy, M.J. developed symptoms of vascular insufficiency of her lower extremities. A bilateral venous duplex scan demonstrated extensive thrombus in her right popliteal, femoral, and common femoral veins and partial thrombus in her left common femoral and popliteal veins. Because the thrombosis progressed despite warfarin and enoxaparin therapy, a continuous infusion of IV heparin was initiated. Following hospitalization, M.J. was discharged on a continuous heparin infusion at a dose of 1,800 units per hour.

## Incidence

Venous thromboembolic disease includes superficial and DVT, PE, and thrombosis of venous access devices. This disease affects 15% of patients with cancer and is the second leading cause of death in hospitalized patients with cancer (Haire, 2000). Thromboses also have been found postmortem in up to 50% of patients with metastatic cancer (Walsh-McMonagle & Green, 1997). In one study of women with stage II breast cancer receiving chemotherapy, the rate of thrombosis was 5%–13%, with the highest rates observed in postmenopausal women (Rickles & Levine, 2001). The addition of tamoxifen to chemotherapy increases the risk for venous thrombosis over chemotherapy alone (Saphner, Tormey, & Gray, 1991).

*Submitted October 2003. Accepted for publication November 5, 2003. (Mention of specific products and opinions related to those products do not indicate or imply endorsement by the Clinical Journal of Oncology Nursing or the Oncology Nursing Society.)*

Digital Object Identifier: 10.1188/04.CJON.289-299