Osteoporosis in the Oncology Setting

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As an advanced practice nurse, you care for patients who have a variety of chronic conditions, and you are expected to handle them all. How do you keep up with all the advances in cardiology, endocrinology, gastroenterology, and infectious disease? You read this column, dedicated to managing a variety of primary care disorders in conjunction with cancer treatment. If you have developed expertise in management of one or more chronic diseases, consider writing for this column. Contact Associate Editor Joyce Marrs, MS, APRN-BC, OCN®, AOCNP, via e-mail at joycemrn@sbcglobal.net.

Case Presentation

Betty is a 67-year-old woman originally diagnosed in 1992 with a tumor 1C, node 0, metastasis 0 infiltrating ductal carcinoma that was estrogen and progesterone receptor positive. She was treated with a right modified radical mastectomy followed by five years of tamoxifen. In October 2001, she had a local recurrence that required an excision of a 0.5 cm diameter lesion she had a local recurrence that required an excision of a 0.5 cm diameter lesion followed by radiation, chemotherapy with cyclophosphamide and doxorubicin, and hormonal therapy with letrozole (Femara®, Novartis Pharmaceuticals, East Hanover, NJ).

Betty’s personal medical history includes two pregnancies, menopause at the age of 55, and hormone replacement therapy with estrogen and progesterone. She has a history of hyperlipidemia and nephrolithiasis. She denies any alcohol, tobacco, or illicit drug use. Significant family history includes her mother having an 800 IU daily.

Case Discussion

Betty was 55 years old when originally diagnosed with breast cancer. Menopause occurred with the administration of adjuvant chemotherapy. With the care she has received, Betty has survived her cancer for 12 years with a good quality of life. However, like many other women surviving breast cancer today, treatment options can produce other long-term disorders, such as osteoporosis (Twiss et al., 2001).

Osteoporosis is a disease that occurs with aging as a result of estrogen loss. Approximately 28 million Americans have osteoporosis or osteopenia (Malabanan, 2003; Mourad, 1998). The process of remodeling for one cycle takes four months in a healthy adult, whereas the process may take up to two years in a person with osteoporosis (Mourad). The rate of bone resorption and bone formation is generally in constant equilibrium in healthy individuals. Osteoporosis occurs when the remodeling cycle is out of balance.

In osteoporosis, bone replacement is slower than bone resorption, causing a net loss of bone (Malabanan, 2003). Bone resorption occurs when osteoclasts, cells that originate from monocytes and macrophages, remove old or damaged bone. Bone formation occurs when osteoblasts set down the organic matrix by depositing calcium and phosphorus into the osteoid.

Risk Factors

The imbalance in bone remodeling can begin slowly at age 40 with an acceleration at the time of menopause (Twiss et al., 2001). Premenopausal female cancer survivors treated with chemotherapy may experience chemotherapy-induced menopause. Earlier

Osteopenia can lead to osteoporosis. Osteopenia is defined as a decreased bone density mass when compared to a healthy, 30-year-old adult (Slovik, 2002).

Pathophysiology

Bone mass is laid down by age 20. However, throughout life, the bone continually completes a remodeling cycle. The cycle occurs in two phases: bone resorption and bone formation (Malabanan, 2003; Mourad, 1998). The process of remodeling for one cycle takes four months in a healthy adult, whereas the process may take up to two years in a person with osteoporosis (Mourad). The rate of bone resorption and bone formation is generally in constant equilibrium in healthy individuals. Osteoporosis occurs when the remodeling cycle is out of balance.

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