Therapeutic Role of Bisphosphonate and Radiation Combination in the Management of Myeloma Bone Disease

To the Editors: We read the interesting article by Yeh and Berenson (1) on the therapeutic strategies, such as radiation, surgery, and bisphosphonate therapy, in the management of myeloma bone disease, which is a major cause of morbidity for patients with multiple myeloma. An imidazole-containing bisphosphonate, zoledronic acid, has been shown to act synergistically with other chemotherapeutic agents, which further supports the notion that the combined use of bisphosphonates as a radiosensitizing agent, and radiotherapy (2).

We have shown recently that using the combination of zoledronic acid and radiation synergistically enhanced growth inhibition on breast cancer cells compared with each agent alone (3). The ability of zoledronic acid to arrest cells in the G2-M phase or to prolong cell cycle progression raises the possibility of zoledronic acid as a potential cell cycle radiosensitizer (4). Both prolonged G2-M accumulation concomitant with an increase in susceptibility to induction of apoptosis and Ras signaling blockade may be associated with the cellular mechanisms of radiosensitization produced by bisphosphonates in tumor cells (5).

In patients with multiple myeloma presenting with widespread bone lesions, retreatment of the same bone lesion is a factor that diminishes the quality of life. Addition of bisphosphonate treatment to standard palliative radiotherapy might improve the latter’s effectiveness. For myeloma bone disease, combining standard radiation treatment with bisphosphonates might produce the same effect with a lower radiation dose or lower fraction number, thus producing fewer side effects. We feel that this concept should be subjected to clinical trial.

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References

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