

Radiopharmaceuticals for Painful Bone Metastases: Perspective from Radiation Oncology

Elizabeth A. Barnes, MD, FRCP(C)

Commentary on “Radiopharmaceuticals: When and How to Use Them to Treat Metastatic Bone Pain” by Paes et al. (Page 197).

Cancer-related bone pain is a significant cause of morbidity and reduces quality of life for patients with bone metastases. Management should be conducted in a multidisciplinary setting with a multimodality approach. Radionuclides are an effective treatment option for patients with multifocal osteoblastic metastases, which are typically seen in patients with prostate cancer. Radionuclides can be given on an outpatient basis with simple radioactive precautions and do not require a visit to a radiotherapy center. However, the use of radiopharmaceuticals has been consistently reported as underutilized in the literature. Reasons for underutilization include lack of knowledge and awareness by community practitioners, misconceptions on the toxicity of treatment, and lack of health policy support.¹ There is worry about delayed myelosuppression preventing administration of chemotherapy. In addition, radionuclides are usually administered by nuclear medicine physicians, who are not involved in the direct clinical care of cancer patients.

Paes and colleagues provide a useful and informative review on the indications, selection criteria, efficacy, and toxicity of radionuclides, with details on strontium and samarium, the two most common radionuclides in clinical use in the United States. Radionuclides are often used as an alternative to external beam radiotherapy (EBRT), when several sites of painful osteoblastic metastases are present in a distribution greater than that which can be conveniently or safely treated with localized EBRT. The use of hemibody radiotherapy, which can also

target widespread bone disease, has largely fallen out of favor in the developed world due to worries about acute and late toxicity. The ASTRO evidence-based guidelines on palliative radiotherapy for bone metastases have recently been published.² They recognize that radionuclides are an important and often underused treatment option, as well as mention that their use does not obviate the need for EBRT. The guidelines state that additional prospective studies should address the prophylactic use of systemic radionuclides in patients with limited bone metastases as well as the possible combination of radionuclides with other systemic agents such as bisphosphonates or chemotherapy.

Paes and colleagues explore the possible role of chemotherapy as a radiosensitizer and present evidence that there is no biological competition between bisphosphonates and radionuclides so that both can be used in clinical practice. Moving beyond pain palliation, the authors advocate for the use of radionuclides early in the disease while marrow reserves are still high and where there may be a theoretical benefit of targeting subclinical disease and improving patient outcomes. A phase II trial suggested that in patients with advanced prostate cancer, the addition of radionuclides to systemic chemotherapy would improve survival.³

Using radionuclides for retreatment when normal tissue tolerance prevents repeat EBRT is also an area that has not been explored in prospective trials. The currently open NCIC SC20/RTOG 0433 trial randomizes between single and multiple fractions of local EBRT in the retreatment of painful bone metastases;⁴ however, a third course of EBRT is not usually possible due to concerns of normal tissue late toxicity. It would be very interesting to know the efficacy of radionuclides in this clinical situation.

In summary, there are many exciting questions that need to be answered to optimize the timing of radionuclide administration and its integration into management of metastatic bone disease. This article provides a welcome review on this topic with

Dr. Barnes is from the Department of Radiation Oncology, Odette Cancer Centre, Toronto, Canada.

Correspondence to: Elizabeth A. Barnes, MD, FRCP(C), Department of Radiation Oncology, Odette Cancer Centre, 2075 Bayview Avenue, Toronto, Ontario, Canada M4N3M5; telephone: (416) 480-4951; fax: (416) 480-6002; e-mail: toni.barnes@sunnybrook.ca

J Support Oncol 2011;9:208–209
doi:10.1016/j.suponc.2011.06.006

© 2011 Elsevier Inc. All rights reserved.

the goal of optimizing outcomes and quality care for patients with bone metastases.

Conflicts of Interest Disclosures: The author has completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

References

PubMed ID in brackets

1. Damerla V, Packianathan S, Boerner PS, et al. Recent developments in nuclear medicine in the management of bone meta-

stases: a review and perspective. *Am J Clin Oncol* 2005;28(5):513–520.

2. Lutz S, Berk L, Chang E, et al. American Society for Radiation Oncology (ASTRO). Palliative radiotherapy for bone metastases: an ASTRO evidence-based guideline. *Int J Radiat Oncol Biol Phys* 2011;79(4):965–976.

3. Tu SM, Millikan RE, Mengistu B, et al. Bone-targeted therapy for advanced androgen-independent carcinoma of the prostate: a randomised phase II trial. *Lancet* 2001;357(9253):336–341.

4. [ClinicalTrials.gov](http://clinicaltrials.gov), Single-fraction compared with multiple-fraction therapy in treating patients with previously irradiated painful bone metastases, <http://clinicaltrials.gov/ct2/show/NCT00080912>.