

Randomized trial of short- versus long-course radiotherapy for palliation of painful bone metastases.

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Abstract:

BACKGROUND: Radiation therapy is effective in palliating pain from bone metastases. We investigated whether 8 Gy delivered in a single treatment fraction provides pain and narcotic relief that is equivalent to that of the standard treatment course of 30 Gy delivered in 10 treatment fractions over 2 weeks. **METHODS:** A prospective, phase III randomized study of palliative radiation therapy was conducted for patients with breast or prostate cancer who had one to three sites of painful bone metastases and moderate to severe pain. Patients were randomly assigned to 8 Gy in one treatment fraction (8-Gy arm) or to 30 Gy in 10 treatment fractions (30-Gy arm). Pain relief at 3 months after randomization was evaluated with the Brief Pain Inventory. The Wilcoxon-Mann-Whitney test was used to compare response to treatment in terms of pain and narcotic relief between the two arms and for each stratification variable. All statistical comparisons were two-sided. **RESULTS:** There were 455 patients in the 8-Gy arm and 443 in the 30-Gy arm; pretreatment characteristics were equally balanced between arms. Grade 2-4 acute toxicity was more frequent in the 30-Gy arm (17%) than in the 8-Gy arm (10%) (difference = 7%, 95% CI = 3% to 12%; $P = .002$). Late toxicity was rare (4%) in both arms. The overall response rate was 66%. Complete and partial response rates were 15% and 50%, respectively, in the 8-Gy arm compared with 18% and 48% in the 30-Gy arm ($P = .6$). At 3 months, 33% of all patients no longer required narcotic medications. The incidence of subsequent pathologic fracture was 5% for the 8-Gy arm and 4% for the 30-Gy arm. The retreatment rate was statistically significantly higher in the 8-Gy arm (18%) than in the 30-Gy arm (9%) ($P < .001$). **CONCLUSIONS:** Both regimens were equivalent in terms of pain and narcotic relief at 3 months and were well tolerated with few adverse effects. The 8-Gy arm had a higher rate of re-treatment but had less acute toxicity than the 30-Gy arm.

Comments:

Strengths/uniqueness: This article provides a well-designed randomized study of short- vs. long-course radiotherapy for palliation of painful bony metastases in a focused, but clinically important, subset of breast and prostate cancer patients since these patients tend to survive longer than patients with bony metastases from other primary sites. The study takes into account other parameters such as narcotic relief, use of bisphosphonates, prior or concurrent medical therapies, Karnofsky performance status, and incidence of retreatment. The authors provide a good analysis of study limitations.

Weakness: As identified by the authors: these results are valid for patients with metastatic breast or prostate cancers and therefore outcomes may be different with bone metastases from other primary sites; completeness of assessment was marginal with 1/3 of patients excluded from the study due to incomplete assessments where 50% of the dropout rate was due to frailty or death.

Relevance to Palliative Care: This article concludes that short-course, single fraction palliative radiotherapy for patients with bony metastases due to breast or prostate malignancy was equivalent to long-course treatments in terms of pain relief, narcotic use, and pathologic fracture incidence. Acute toxicity of short-course treatments were statistically lower, but resulted in overall increased rate of re-treatment when compared to long-course therapy. Short-course radiotherapy would have the logistical advantage of providing comparable pain relief as long-course treatments, but it would also be much easier for the patient and their families to arrange for one session rather than ten. Future studies will help to determine whether single dose of 8 Gy should become the standard treatment of choice for palliative radiotherapy of bony metastases.