

Open Access

Abstract

Published 04/02/2023

Copyright

© Copyright 2023

Lee. This is an open access abstract distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Distributed under

Creative Commons CC-BY 4.0

Dose Fractionations of Stereotactic Body Radiation Therapy in Painful Bone Metastases: A Systematic Review and Network Meta-analysis of Randomized Controlled Trials

Chia Ching Lee ¹

1. Radiation Oncology, National University Cancer Institute Singapore, Singapore, SGP

Corresponding author: Chia Ching Lee, chiaching.lee07@gmail.com

Categories: Radiation Oncology

Keywords: palliation, bone metastases, stereotactic ablative body radiotherapy

How to cite this abstract

Lee C (April 02, 2023) Dose Fractionations of Stereotactic Body Radiation Therapy in Painful Bone Metastases: A Systematic Review and Network Meta-analysis of Randomized Controlled Trials. *Cureus* 15(4): a905

Abstract

Objectives:

The preferred dose fractionation of stereotactic body radiation therapy (SBRT) in painful bone metastases is unclear. This study aimed to compare the efficacy of various dose fractionations of SBRT in palliating symptomatic bone metastases.

Methods:

Biomedical databases and conference proceedings were searched for eligible randomized controlled trials (RCTs) comparing at least two dose fractionation schedules with at least one arm using SBRT. We assessed the methodological quality of each trial using the revised Cochrane risk of bias tool. The outcome of interest was overall pain response at 3 months. We performed fixed effects frequentist network meta-analysis.

Results:

Five RCTs including 894 patients comparing six treatments were identified. All but one trials had low risk of bias. All the trials compared SBRT with conventional external beam radiation therapy (cEBRT) using either 30Gy in 10 fractions, 20Gy in 5 fractions or 8Gy in 1 fraction which was analyzed as a reference group. Ordered from the most to the least effective determined by the results of trials, treatments associated with improved overall pain response at 3 months when compared to cEBRT included 24Gy in 1 fraction (odds ratio (OR), 2.25; 95% confidence interval (CI), 0.76-6.65; P= 0.19), 12-16Gy in 1 fraction (OR, 1.78; 95% CI, 0.91-3.48; P= 0.27), 24Gy in 2 fractions (OR, 1.34; 95% CI, 0.84-2.15; P= 0.43), 27Gy in 3 fractions (OR, 1.33; 95% CI, 0.17-10.22; P= 0.47) and 16-18Gy in 1 fraction (OR, 0.49; 95% CI, 0.32-0.77; P= 0.96).

Conclusion(s):

In this network meta-analysis, as compared to conventional external beam radiation therapy, stereotactic body radiation therapy to a dose 24Gy in 1 fraction (EDQ2= 68Gy, assuming alpha-beta ratio of 10) may provide the greatest overall pain response benefit in painful bone metastases. Further studies to confirm the dose-response relationship is warranted.