

Annotated bibliography

Balakrishnan, R., Sebastian, P., & Zaveri, G. 2022. Radiotherapy for spinal metastasis: A narrative review. *Indian Spine Journal*, 5(2), 185-192. doi: 10.4103/isj.isj_79_21

This article focuses on an overview of SBRT for spinal metastases, including what SBRT is, indications and contraindications, SBRT outcomes compared to EBRT outcomes, and the procedure. The treatment is planned to use a CT scan and the entire clinical target volume includes the entire vertebral body, pedicle, lamina, transverse process, and spinous process. This article also includes a picture of the treatment plan that shows the planned coverage on the spine.

Dunne, E., Liu, M., Lo, S., & Sahgal, A. 2022. The changing landscape for the treatment of painful spinal metastases: Is stereotactic body radiation therapy the new standard of care. *Clinical Oncology*, (34), 325-331. doi: 10.1016/j.clon.2022.02.005

This article focuses specifically on pain control related to SBRT for spinal metastases. Three different studies were conducted that compared the outcomes of SBRT and cEBRT for spinal metastases. The target volume included the tumor and the spine segment. A complete response rate for pain at the index site was observed three months after treatment. One study showed, 40/114 patients who received SBRT had a complete response to pain in three months, and only 16/115 patients who received cEBRT had a complete response to pain. A three-month time frame allows improvement in quality of life to be assessed.

Gong, Y., Xu, L., Zhuang, H., Jiang, L., Wei, F., Liu, Z., Li, Y., Yu, M., Ni, K., & Liu, X. 2019. Efficacy and safety of different fractions in stereotactic body radiotherapy for spinal metastases: A systematic review. *Cancer Medicine*, (8), 6176-6184. doi: 10.1002/cam4.2546

This article specifically focuses on the statistics related to the number of fractions a patient receives with SBRT for spinal metastases. It also identifies the efficiency and toxicity of different fractions. A number of studies were gathered for patients that had spinal metastases. For patients with a single fraction that received a dose between 15 and 24 Gy, the overall survival and local control was 92.7% after one year, and 70% after two years. Patients who received two fractions had localized control of 84.6% and an overall survival rate of 70.4%. Patients included in the three-fraction group had localized control of 86.8% and overall survival rate of 60.1% after a year. Fewer studies were gathered for four and five-fraction groups. Vertebral compression fractures also occurred in some patients throughout these studies.

Long, B., Rollins, J., & Smith, B. (2016). *Merrill's atlas of radiographic positioning & procedures*. St. Louis, MO: Mosby Elsevier.

Merrill's provides a brief overview of radiation oncology. The basic principles of radiation oncology, historical development, cancers, and risk factors are all mentioned. A picture of a virtual CT simulation is included on page 492, which shows the planned beams of radiation directed at the specific treatment site on coronal, sagittal, and transversal images.

Massat, M. 2020. Stereotactic body radiation therapy for oligometastatic spine disease. *Applied Radiation Oncology*, 9(3), 30-31. Retrieved from <https://appliedradiationoncology.com/articles/stereotactic-body-radiation-therapy-for-oligometastatic-spine-disease>

Oligometastatic disease is when cancer cells from the primary tumor travel through the body/blood to form a small number of detectable metastatic lesions somewhere else in the body. The doctors in this article believe SBRT may provide a unique opportunity for durable, long-term local control in patients with these oligometastases. Cancers such as renal cell, melanoma,

sarcoma, and colorectal better benefit from SBRT. This article also provides a good image of the treatment plan of the spine, while showing the dose to spinal cord and spine lesion.

Zeng, Kang., Tseng, Chia-Lin., Soliman, H., Weiss, Y., Sahgal, Y., & Myrehaug, S. 2019.

Stereotactic body radiotherapy (SBRT) for oligometastatic spine metastases: An overview. *Frontiers in Oncology*, 9(337), 1-11. doi: 10.3389/fonc.2019.00337

This article focuses on Stereotactic Body Radiation Therapy and how it is commonly used to treat metastatic tumors on the spine. SBRT is used for localized control and pain relief. The use of SBRT requires careful patient selection and understanding of potential toxicities. The prognosis varies for patients who receive this treatment, and a scoring system categorizes patients into groups of best or poor survival. SBRT commonly treats radioresistant tumors well such as renal cell carcinomas, melanomas, and sarcomas. This article also provides a picture of treatment planning with structures outlined to determine dose and structures in that field.